

A Scoping Review of Women in Marine Industries: The Importance of Female Leadership

by © Cole Long

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ABSTRACT

Introduction: Marine industries are traditionally male-dominated, where women make up only 2% of the workforce. For the sustainability and growth of marine industries, it is important to bring more diversity into the workforce. **Methods:** The aim of this project was to conduct a scoping review on peer-reviewed published literature that examined the experience of women working on the water within marine industries over the past 25 years. Standardized scoping review methodology and PICO model framework proposed by Tricco in 2017 was followed to conduct this review. **Results:** A total of 1028 abstracts were produced by a SCOPUS search, and of this list, 207 abstracts were selected, 201 papers were then identified for review. Only 121 publications were deemed relevant to the study after review. A summary of the papers was divided into eight themes. Themes highlighted four current challenges for women within the marine industry, and the other four themes offered solutions to gender inequality. **Conclusion:** The results highlighted the importance of recruitment of women within the marine industry to sustain its growth and success. Women leaders are needed to help promote female recruitment and support working female mariners. Female enrollment in educational institutions needs to increase. Women leaders are needed to help recruit, educate, and train the next generations of women mariners.

Keywords: Women, education, leadership, sustainability

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LIST OF ABBREVIATIONS

GECAMET Gender Equality and Cultural Awareness in Maritime Education and
Training

Chapter 1: Review of Literature

1.1 Introduction

Improving gender equality is a major social movement in ensuring equal human rights. One sector in particular where we see major gender inequality is the maritime industry where women make up only 2% of the employees and workforce (Kaplan 1998; MacNeil 2017). Even though history shows significant improvements in women's rights, males and females are still not treated equally within society and not within this major economic sector of the marine industry. A large portion of this 2% female population within the marine industry lack power and usually hold the least protected and lowest-paying jobs (Horck 2010). The marine industry is responsible for much of the world's economic growth and development, and could benefit greatly from increasing women's representation within. Women, when given the opportunity (Cojocaru et al. 2018), have successfully performed and contributed greatly to our society. The marine industry is lacking gender diversity, and needs immediate change to meet the needs of the growing industry. Understanding current barriers and facilitators impacting women's participation within the maritime industry is of the utmost importance in decreasing the gender gap within this sector.

1.2 Understanding Barriers for Women within the Maritime Industry

Many women have reported life at sea to be problematic, and many quit before achieving the ranks of Captain or Chief Engineer (Horck 2010). Specifically, gender bias, sexually harassment, lack of opportunities, and being within the minority. Many women use strategies to fit or blend in with their male counterparts, and this underlines the conflict between gender equity (Kitada 2013). The lack of women in the field has a negative effect on those women who are

employed and currently represented in the industry. Women have also noted a lack of amenities as a common barrier to their workplace experience, such as adequately fitted equipment needed to perform their job (Turnbull 2013). This also includes medical items such as contraceptives, confidential medical advice, and solid communication lines (McNeil and Ghosh 2016). The following review will highlight why these issues are present, and current causes of women being within the minority of this industry.

1.2.1 Societal norms

The significantly larger percentage of men trained and employed by the maritime industry has led to a stigma towards women within the field (Horck, 2010). Each generation has been exposed to men in maritime fields, such as offshore workers, fishers, and ship captains. This stigma has even been created within families themselves, as traditionally only fathers and husbands have been known to leave for maritime work. This has led to a lack of awareness that these are also potential careers for women to strive towards. This type of repeated exposure contributes significantly to the culture and can lead to women believing they do not belong in this field or that it is not for them. There has been little promotion for women to train for and pursue a career in the maritime industry and this is undoubtedly one contributor to the imbalance in female to male employment rates. It is also often left up to women to advocate for change or adjust to their surroundings, and break past the illusions that have been propagated (Boström Cars and Österman, 2015). Society has perceived and labeled women leaders and employees in the maritime industry have lower expectations towards female leaders (Fjærli, Nazir, and Øvergård 2017). These stereotyped personality characteristics are one potential contributor to how our society has constructed such an imbalance in the maritime field.

Women maritimers are open to sharing motivational encouragement and sources of inspiration for other women seafarers if given the proper media platform (Dragomir et al. 2018). Information about these female leaders needs to be broadcasted and made easily accessible to empower other seafarer women (Dragomir et al. 2018). Understanding new ways to help promote future women within the industry is of importance, as well as spreading awareness about gender equality.

1.2.2 Gender Bias

Women have experienced several injustices when working offshore and are sometimes not seen as equal by fellow coworkers. Experiences such as sexual harassment, gender bias, and lack of equal opportunities are often issues for women maritime workers (Newell et al. 1995). A study from 1995 on the United States Navy examined whether recipients of sexual harassment differ in their perceptions of equal opportunity compared to those who have not been harassed. The results indicated that women who were sexually harassed perceived that there was less equal opportunity in the Navy than women who had not been harassed (Newell et al. 1995)

With factors such as harassment and a low percentage of women within the industry, there are often many cases where women do not feel protected. One way to help limit sexual harassment cases and empower current employees was found by a 2018 study conducted by Gender Equality and Cultural Awareness in Maritime Education and Training (GECAMET) to increase women's leadership. Where several women were interviewed within the shipping industry to understand how they handle current inequalities such as sexual harassment (Dragomir et al. 2018). The GECAMET study objective was to identify best practices that can be recommended by Maritime Education and Training and shipping institutions to improve women's access to a seafarer career—to look at how to answer questions such as "how do we empower

women," and "how do we develop females' leadership abilities", believing that having more women leaders within the industry is key in answering these questions (Dragomir et al. 2018).

1.2.3 Lack of Policies and Protection

It is also important to create new policies and programs that help protect those employed within the industry from harassment. Females who are in the minority and are offshore for long periods are at risk of experiencing harassment from coworkers. There must be strict policies put in place to deal with offenders (MacNeil and Ghosh 2016). Another approach for employers to implement is to, where possible, provide opportunities for female workers to work as crew members with other female colleagues (MacNeil and Ghosh, 2016). This is a strategy that aims to help female employees feel support from other women when working as a minority within this industry. Women within the industry have been victims of prejudice and injustice. Women have continued to be a part of the minority in all aspects of the industry. Recruitment, education, research, and employment have all been directed toward men in the maritime industry and have seen minimal improvement in the number of women involved.

1.2.4 Research and Safety Challenges

It is a challenge to conduct research on the small percentage of women that are employed by the maritime industry. In fire services, an important safety aspect to offshore emergency safety, all firefighters are required to do the same job no matter what their gender (Fisher 2020). Parallels can be seen between the need for gender-based research in the maritime domain and in the field of firefighting. Much research has been done to help support firefighters both mentally and physically, but there has been acknowledgement that there is a need to accommodate gender differences. Women are often overlooked in fire safety research since they require different equipment and services and are fewer in number. Women make up only four percent of all

firefighters, similar to their maritime colleagues, but do not deserve to also be overlooked in research. It is critical to understand how to improve upon women's safety within this field, and it is unacceptable not to include them in research as we try to increase the number of women employed in industrial jobs (Fisher 2020). Lack of knowledge on women firefighters leaves them at an enormous disadvantage compared to their men colleagues.

These same issues have also been present with women in the domain of offshore ocean safety. Although there is a small percentage of women working in the field compared to men, they are often overlooked and are not accommodated for their needs when it comes to safety (Turnbull 2013). On many ships and offshore rigs, women are often not supported with proper safety equipment and must settle for equipment designed and made for men. This also tends to be the case in offshore safety research, and if women want to participate in a study, they are often required to use men's equipment. This is potentially dangerous and the lack of relevant safety research data creates a threat for women wanting to pursue these careers. Underrepresentation of women in all fields of study has been ongoing for years, and there are definite risks associated with not conducting gender-based research (Sinden et al. 2018).

1.2.5 Education

Boström Cars and Österman (2015) stated there is a “gender blindness” in maritime education, simply because the industry has been dominated by men over the years. There are many programs’ curricula that do not include education regarding gender equality or gender awareness (McNeil and Ghosh 2017). Many feel that the topics of gender equality could be viewed as unnecessary, but that is the very reason it needs to be addressed (McNeil and Ghosh 2017). The needs of women who undergo industrial training may also differ from the training needs of men (Sinden et al. 2013). In broader terms, women have been shown to be given

unequal access to educational opportunities to grow and develop in their careers. It has been shown that the worthiness of applicants applying for post-secondary education has not been decided purely on the best resume and being the most deserving (Helin et al., 2019). Data from Statistics Finland contained information from multiple administrative sources, including population censuses from 1970 onward, and linked employer-employee data from 1987 onward and showed that women's academic careers differ from those of men both in terms of the time taken for education and in terms of how many women get a higher education, with women's PhDs and full professorships being delayed compared to those of men (Helin et al. 2019). This type of delay in graduation is a significant setback in terms of job opportunities, careers, and status based on experience. Relating to the marine industry, women who are attempting to finish up their respective programs are potentially going to take longer than a man—putting them at a disadvantage following completion of their higher education.

There have been efforts to improve upon educational opportunities and programs for women, and the World Maritime University has been sponsoring more female students than ever (Horck 2010). However, no significant changes have been achieved with little improvement in the number of females involved in the maritime industry. Even women who complete their higher education and move into the maritime industry still face barriers that deter them from the field. The retention of women workers is crucial in helping shape the industry. There are many shortages in findings both men and women with the proper credentials to become a seafarer. It has been proposed that the recruitment of women is the solution to fulfilling this need in the maritime industry (Thomas 2004). Proper recruitment and training must take place in order to develop this opportunity. However, this has not happened. Lack of promotion for women within the industry, hurdles in having equal access to education, limiting sexual discrimination, and

establishing mentoring initiatives, have all proven to be issues in the successful recruitment and retention of female employees (MacNeil and Ghosh 2016).

1.3 Summary

The main topics discussed in this literature review were used to identify current barriers to women being represented within the maritime industry. What was discovered is that increasing women's representation, leadership opportunities, and roles of power can significantly lower the gender gap we see today. The following chapters will detail a project conducted to better understand current barriers and facilitators of increasing women's representation within the maritime industry. The study aims to utilize findings to help with future research and inform institutions and organizations on this current issue.

Chapter 2: Co-Authorship Statement

The following specifies my role in the preparation of the manuscript.

Research Design

The methodological procedures were developed based on previous research in the field of scoping review methodology and the need of more research being conducted with regards to women within the marmite industry. Discussions with Dr. Heather Carnahan and colleague Carla Chaytor assisted in the refinement of the project details and aided in obtaining the ethics approval by the Memorial University Interdisciplinary Committee on Ethics in Human Research (ICEHR).

Data Collection

The collection of the data was completed by myself, with assistance from Carla Chaytor.

Data Analysis

The data analysis was completed by myself with the assistance of Carla Chaytor and direction from Dr. Heather Carnahan.

Manuscript Preparation

The manuscript was written by myself, with the editing and feedback assistance from Dr. Heather Carnahan and Carla Chaytor.

Chapter 3: Manuscript

A Scoping Review of Women in Marine Industries: The Importance of Female Leadership

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3.1 Introduction

3.1.1 Background

There is a gender imbalance in the workforce that spans the globe (Macneil 2017). A significant movement towards ensuring equal human rights includes improving women's rights. Throughout history improving upon gender inequality has been evidenced by women: having the right to vote, being accepted into different employment industries, choosing not to have children, and choosing to return to their job after having children. It is also evidenced by providing men with paid paternity leave which facilitates women to continue working, and most recently, there has been a movement towards ensuring all people are paid equally and have equal work opportunities (Macneil 2017). However, despite significant improvements in women's rights, males and females are not always treated equitably within society and equal work opportunities do not always exist. The maritime industry is traditionally a male-dominated industry, where women make up only 2% of the workforce (Kaplan 1998; Macneil 2017). A large portion of this 2% female population are workers on cruise ships and ferries which are usually the least protected and lowest-paying maritime jobs (Horck 2010).

This 2% statistic is generalized across the entire maritime sector and does not accurately reflect any particular maritime trade. Many factors impact a woman's ability to participate within the maritime workforce, and there is not one generalizable issue that has been identified to increase the overall population of women in the industry. For the sustainability and growth of the marine industry, it is important to develop new ways to bring more diversity into the workforce.

As the maritime industry continues to grow the need to include women is only going to continue to rise across all sectors. Cultural norms, education, recruitment, and workplace opportunities all impact the number of women represented in the industry. Understanding the

nature of the current workplace for women in the marine industry will help direct us to find solutions to attracting more women into maritime careers and continue its growth.

3.1.2 Purpose

We conducted a scoping review to explore the experiences of women in the marine industry, by addressing the specific question: What has been the experience of women in the maritime industry over the last 25 years? We ask this question with the intention of creating new rationales and approaches to improving the number of women represented in the maritime industry. We used this approach rather than a systematic review because, while there are numerous publications that address the issue, there are few controlled studies that examine issues related to women at sea. Scoping reviews are used to identify gaps in the literature by mapping particular research areas and reviewing all primary sources of available evidence (Tricco, Lillie, and Zarin 2016). The scoping review can present a broad overview of the evidence pertaining to a topic and is useful when examining areas that are emerging, to clarify key concepts (Tricco et al., 2016). This methodology is heavily descriptive and requires analytical synthesis of available evidence without major assessment of the quality of the work (Williams et al. 2013).

3.2 Methods

3.2.1 Scoping Review

The present review is based on the scoping review methodology proposed by Tricco (2017). With the assistance of a librarian at the Marine Institute of Memorial University, the primary search of scholarly literature consisted of searching SCOPUS for papers published between 1995 and August 2020. To determine eligible search terms and criteria we followed a PICO model framework (Schardt et al. 2007). The PICO model consists of four categories for framing the research question: population, intervention, control, and outcomes (Schardt et al.,

2007). Our population search terms included: women, female, gender, and sex. Intervention criteria consisted of working on the water within the Marine Industry. Search terms included maritime, marine transport, shipping, working at sea, off-shore, lake, river, occupation, career, and labor. The comparison group for women was men. Interested outcomes were as follows: pay, experience, rank, harassment, success, satisfaction, happiness, length of career, and education. Only abstracts meeting these criteria were accepted for further review.

Two authors on our research team (C.L. and C.C.) independently reviewed all abstracts to determine their relevance to the study [*Figure 2 near here*]. Authors compared their decisions and a discussion regarding any disagreement was had with the entire research team until consensus was reached. Full texts were then retrieved and reviewed using a data charting spreadsheet to record the primary author, year of publication, journal of source, role/experience of women, and primary conclusion of the study. Data charting was completed by the first author and then reviewed by the second author for confirmation. After reading all the full texts, papers that were considered not relevant for the review were removed.

3.2.2 Data analyses

Papers were categorized based on the various characteristics of the studies reviewed. Thematic construction was used to provide an overview of the literature, and to identify major findings (Levac, Colquhoun, & O'Brien, 2010). We employed a content analysis technique (Williams et al. 2013), using relevant research findings to create initial categories for mapping barriers and facilitators/positive outcomes for women within the maritime industry.

The descriptive analysis started with each publication being labeled with the main finding allowing for primary issues, main conclusions, and key findings. Using these findings, we developed eight themes based on all accepted literature and mapped each publication to its

relevant theme. Following this, the research team reviewed each main theme and the related literature to develop final conclusions. Each phase of this process was reviewed by the entire research team.

3.3 Results

3.3.1 Numerical summary

A total of 1028 abstracts were produced by the SCOPUS search with help of a librarian, and after this list was evaluated, 207 abstracts were selected to be reviewed. Based on our assessment of the abstracts, 201 papers were identified as being relevant. Only 121 publications were deemed relevant to the study after they full-text review. Of the 121 publications accepted, the findings were read and divided into eight themes. Refer to Table 1 in the Appendix for a statement on each of the papers reviewed. Themes highlighted four current challenges for women within the marine industry (struggle for equal opportunity, education and development of women leaders, sustainability of the industry, and sexual harrasment), and the other four themes offered solutions to gender inequality or positive outcomes for women related to gender parity (polcy change, feamale leadership, employment opportunities, and education of society) .

[Figure 1 near here].

There were 45 articles in total that developed four of the themes identifying current challenges for women participating within the industry. There were 17 articles identifying challenges to equal opportunity, 16 articles highlighting issues with education and development of women, eight highlighting challenges to the sustainability of the maritime industry, and four publications discussing sexual harassment.

There were 76 publications that identified four solutions for, or positive outcomes from, increasing the number of women represented in the marine industry. Twenty-four articles

identified policy and culture changes, 21 highlighted the positive impact of female leadership, 18 articles addressed the importance of the maritime industry providing career opportunities for women, and 13 articles emphasized the need for educating society about the issue. More details regarding themes are developed below.

3.3.2 Descriptive analysis: Themes that Highlight Challenges

Struggle for Equal Opportunity. The struggle for equal opportunity was found to be the most common barrier discussed in the literature and appeared to be the biggest obstacle for women to be represented in the marine industry. Women are in the minority and are oftentimes overlooked in recruitment, hiring, and promotion. It has been demonstrated that both genders can perform similarly onboard vessels, but women are not given similar opportunities to gain the same work experiences as men while onboard (Cojocaru et al. 2018). Multiple studies revealed that many offshore tasks are dependent on skilled labor and women are seen lacking in these skills due to a lack of opportunity for apprenticeship (Uduji, Okolo-Obasi, and Asongu 2020). Women are just as capable of being trained to perform as skilled mariners with the proper opportunity.

Research revealed that the occupational culture of seafaring often reflects masculine norms and values which could affect women seafarers' behavior and attitudes towards this career (Kitada 2013). These masculine norms can contribute to women not pursuing or maintaining a maritime career (Kitada 2013). Historically women have not had enjoyable, engaging, or opportunistic maritime experiences due to industrial masculine norms. Career advancement and empowerment opportunities appear to be limited for women within the maritime industry. Findings suggest that even in smaller community-based maritime scenarios, unequal power relations established specific roles for women that limited their career advancement (e.g.,

fisheries management) (Kwok et al. 2020). Where men dictate and manage how women are used within their community, and very little choice or power is given to women seafarers in smaller communities.

It was also reported that women are not given the same opportunity to be included in human factors research which further limits consideration of their needs and requirement of different equipment and services for women in the maritime industry (Fisher 2020). It is an expensive investment to provide the same resources to both genders, and because women are in the minority, funds and new developments for them are often overlooked.

Education and the development of Women Leaders. Poor education and training of women were found to be a significant barrier to employment. Education institutions need to invest in facilitating female educational opportunities. Maritime education and training for both genders are crucial for shaping future gender and culture-sensitive seafarers (Belev et al. 2020). Leveraging inclusive education is a tool for promoting gender equality and enhancing the performance of the maritime sector (Mahabir-Lee and Rambarath-Parasram 2020). Many prejudices and a lack of awareness about working in the field of shipping can affect women's willingness to seek workplaces in the maritime sector (Roos 2018). There can be many limiting issues for women, for instance, many maritime-related jobs ashore require experience at sea. The educational systems must support and create enrollment opportunities for women that allow them to gain experience for employment such as experience at sea. Those women who are working at sea are often very limited to specific positions and sectors within the marine industry. There are limited opportunities for new training or certifications to advance their careers (Forkuor, Peprah, and Alhassan 2018). The industry needs women who are actively involved in the management

of marine resources and that acknowledge female needs and roles, alongside stronger involvement of female scholars in marine scientific fields (Michalena et al. 2020).

The growing number of female candidates for future industry roles creates a more competitive environment suggesting that decreasing the gender gap will also benefit the training and efforts of male seafarers (Belev et al. 2020). The education system as a whole should make it an obligation to help solve the challenges of achieving gender equality (Uduji and Okolo-Obasi 2020). Training and developing women to assume roles of authority is a step in solving inequalities.

Sustainability of Industry. Eight articles identified the sustainability of the marine industry as being more successful when more women are represented within it (see Appendix 1). To benefit the industry as a whole, more resources must be invested in lowering the gender gap and giving women job placements. Gender transformation in the workplace is one proactive way to facilitate changes of some entrenched institutional norms that have developed over the years (Nagoli, Binauli, and Chijere 2019)

Results from multiple studies contribute to a growing body of literature highlighting the involvement of women in small-scale fisheries and resource management (Rabbitt et al. 2019). Their contributions in these sectors have positively impacted household food security and the overall economy of smaller communities. Women represent roughly half the population and as such are needed to contribute to the marine industry's growing demands. There is a significant labor shortage for seafarers and currently, employees are being overworked to meet demands. Women are a solution to this issue, however, for integrating more women in the maritime workforce to succeed, attention needs to be directed toward improving living conditions for women seafarers (Call and Sellers 2019). Recruiting and sustaining women employees will help

decrease the gender gap. Changing the culture around gender is needed to enhance women's full participation and equal benefits (Nagoli, Binauli, and Chijere 2019).

It was noted that women tended to support important issues such as global warming, climate change, and food security (Koralagama, Gupta, and Pouw 2016) and a gender lens can be thought of as a way to gain new perspectives on these topics. Research suggests that the involvement of women within the industry will facilitate action toward addressing sustainability issues (Koralagama, Gupta, and Pouw 2016).

Sexual Harassment. Sexual harassment was found to be a significant barrier preventing women's employment within the maritime industry. Sexual harassment within the workplace can cause major traumas, psychological effects, anxiety, and many other long-term health issues (Rebecca et al., 2019). Women are in the minority on ships, vessels, and rigs for weeks and months at a time. The need to feel protected against sexual abuse in these types of situations is crucial in developing a suitable workplace for women (Carballo Pineiro and Kitada 2020). Some methods identified to achieve this are: (a) having women in positions of authority (Lucia 2020), (b) creating stricter policies (Carballo Pineiro and Kitada 2020), and (c) having proper human resource facilities to report issues and cases (Thomas 2003).

Women within the maritime industry have little to no power when it comes to making rules and policies. Women in authority can offer a gendered perspective on life at sea and a better representation of what is experienced. The male-dominated seafarers' union makes it difficult for women to be heard and taken seriously regarding the severity of sexual harassment issues (Lucia 2020). A solution is to form separate women-only committees and unions to raise awareness of verbal and physical sexual harassment experienced by women within the marine industry.

The traditional reluctance of maritime professionals to report any issues onboard is aggravated in the case of sexual harassment. There is a tendency in the maritime community for there to be a reluctance to report any issues onboard. This deference to hierarchy becomes even more exaggerated in the case of sexual harassment due to stigmas (Carballo Pineiro and Kitada 2020). Thus, it is important that there is a zero-tolerance policy to ensure the workplace is safe. This will positively impact the recruitment and retention of women in the maritime industry. Minor punishments related to sexual harassment belittles the harm and influence these cases have on women. Allowing women to feel safe, secure, and protected within the workplace by their employer, can only be achieved through strong policies. Maritime companies all need to develop, implement, and inform high-profile policies on sexual harassment in order to deter these types of actions (Thomas 2006).

Another policy progression that needs to be implemented is confidential access to the ship's doctors, support systems, and human resource representatives to create a safe and welcoming work environment for women (Thomas 2003). Having proper support resources is essential for women to trust that they are protected when reporting any sexual harassment cases. In many cases, women were shamed and had no confidentiality regarding their issues. Stronger policies regarding privacy need to be made in parallel with a strong zero-tolerance sexual harassment policy.

3.3.3 Descriptive Analysis: Themes that Highlight Solutions

Policy Change. When developing policies, it is important to recognize the diverse roles and perspectives of men and women in the marine industry in order to achieve equitable outcomes (Santos 2015). Numerous papers highlighted the need for policy changes that better support and protect women within the industry (Wosu 2019; Dragomir 2018). Maritime

regulations such as the Maritime Labor Convention, organizations such as the International Labour Organization (Dragomir 2018), the government, and all relevant authorities need to create stricter and more beneficial policies to decrease the gender gap within the industry (Ameyaw et al. 2020).

Organizations must create a zero-tolerance discrimination policy that results in a workplace free from discrimination to all underrepresented groups. This will improve the recruitment and retention of women in the maritime industry (Carballo and Kitada 2020). The goal of this is to create a more welcoming environment where women feel safe, protected, and treated as equals to their colleagues. Such policies would include gender-inclusive recruitment and career development opportunities. Any form of discrimination should have known major consequences that actively protect women seafarers in their respected workplace and profession.

The Maritime Labor Convention can also make a major impact by updating gender requirements within the workplace (Dragomir 2018). Organizations need to be more attractive and inviting for females to seafaring jobs onboard ships (Dragomir 2018), and one way to accomplish this is by having a higher number of females represented. A recent success was when the Maritime Labor Convention created new requirements for gender customized work protection equipment onboard ships, separate spaces for toilets and showers on board ships, and accommodation for menstrual needs (Dragomir 2018). The next step is increasing the number of women who can take advantage of these changes.

Mandatory simple and low-cost interventions related to equity and ethical issues can lead to the improvement of the health and welfare of women in the maritime industry (Stannard et al. 2015) such as creating new policies regarding maintenance of gender equity education of current employees. Training recertification is often mandated for courses such as first aid, and CPR.

Requiring the upkeep of gender-inclusive education in a similar manner would be beneficial for creating awareness for women seafarers. Without policy requirements, no change will be enforced, and institutions will continue to avoid or devalue the current gender gap within the industry.

Female leadership. Female leadership seems to have the most positive impact on changing the entire industry's current attitudes and efforts towards women. Female leadership has been seen to have a positive impact in other sectors that include management, political, and governmental roles. Entering a workplace with a female leader is more inviting and a more positive environment for a female workforce. Female representation in maritime leadership creates more confidence that becoming a female seafarer is possible and helps diminish the social stigma revolving around being a female at sea.

One barrier keeping women from positions of power within the marine industry are physical and strength advantages that some men may have over women. With recent advancements and the implementation of automation technology, these advantages are less relevant and should increase employment opportunities for women seafarers (Kim et al. 2019). With automation of technology helping limit most physical barriers, organizations must be committed to creating and developing roles for women to obtain positions of power. Large oil and gas companies have openly committed to increasing the pipeline of STEM professionals, especially among those groups, like women, that are underrepresented in the energy industry (McCloskey, 2015). Creating and developing programs for work opportunities in small communities is another investment in developing future female leaders (Aswathy and Kalpana 2019).

Female leadership can also help contribute to the gendered perspective and help develop novel leadership styles that benefit both female and male mariners (Kitada 2017). For example, some female captains have been documented to demonstrate leadership skills that were more supportive than their male counterparts (Leisher et al. 2016). Another study identified increases in environmental conservation initiatives when women leaders were in charge. While leadership styles may differ, both men and women have been shown to be equally effective leaders (Cojocaru et al. 2018).

Employment opportunities. Another important theme was related to how the maritime industry provides a variety of career opportunities for women, allowing for women to enter the workforce and provide a much-needed positive impact on economic, social, and employment growth around the globe (Liontakis et al. 2020). Jobs such as fishing, shipping, engineering, and management are successfully engaged in by women. Unfortunately, women's roles in supporting the economy are still underestimated and social norms still deter women from these positions (Nurbayani, Anggun, and Wulandari 2019). It was demonstrated that preconceived social roles of being a woman can still be fulfilled while simultaneously being financially rewarded for their participation in the maritime industry (Freitas et al. 2020). Women in the marine industry achieve the same benefits from employment that men demonstrate (Cohen, et al. 2016). Employment within the industry is one way for women to achieve the same financial power as men.

Research in Ghana suggests that the industry has potential for reducing poverty and enhancing economic empowerment of women (Forkuor, Peprah, and Alhassan 2018). If the global industry developed and offered more employment opportunities for women, there would be an exponential economic growth in developing nations. Women are willing to work but it is sometimes a matter of opportunity. Women have been documented immigrating to engage

within the fishing industry. For example, Iceland has actively recruited immigrant women to work in their fisheries (Yingst and Skaptadóttir 2018).

The current successes of the women who comprise the fishing industry appear to be overlooked by many government fisheries management bodies (Nathenson et al. 2017). Government departments should document and acknowledge women who make a living from the marine industry as this would help provide the first measure of the recognition of their contributions, thus strengthening women's chances of negotiating access to marine livelihood resources. Increased awareness and a better capacity of building initiatives have played a part in increasing women's participation in aquaculture activities and are worth investing in (Siddiqua, Haque, and Barman 2017).

Education of Society. The final theme that emerged from the review is the need to educate society on the topic to help limit the stigma that women do not belong within the marine industry. Educating the marine community on gender equity is crucial in shaping new positive female seafarer experiences. Education about equity is also crucial for shaping future gender and culture-sensitive maritime industry and ending negative attitudes towards it will help attract more women in the recruiting process (Belev et al. 2020).

The results showed that the maritime industry is not taking women seriously aboard vessels. There is a commonly held attitude that women still represent novelty where they are still new and did not belong on board ships (Pejović 2020). To create a more equitable environment women must be displayed as equal throughout society, media, education institutions, and economy. One way to achieve this is to emphasize that with recent developments, women are no longer at any significant physical disadvantage. Education is required to avoid discrimination for leaves from work related to pregnancy, childbirth, and breastfeeding (Di Carlo 2019). It has

been shown that institutions and workplaces do very little currently to challenge the traditional gender regimes (Walker, Gleaves, and Peart 2003). To change the gender gaps, topics of equality must be addressed to guidelines, implemented into tools, classes, and training programs offered throughout the industry in all sectors (Mangubhai and Lawless, 2020).

3.4 Discussion

The present scoping review was conducted to understand the current experience of women working within the maritime industry to gain insight as to why women represent such a low percentage of the working seafarer population. Using the scoping review methodology, we reviewed studies from 1995 to 2020 in order to identify the experience of women working within the industry. By viewing this literature with a forward-oriented lens, it can provide maritime organizations with new ideas and concepts to improve opportunities for women. Using this information, it is hoped that decision-makers within the maritime industry will adopt strategies to improve the work experience for female mariners.

The summary of our review should be relevant to all facets of the marine industry and looking at the literature we have proposed recommendations for changes to allow for a decrease in the employment gender gap. This review also identified that the solutions to these issues are quite diverse. However, clearly, the most relevant finding is that there is a need to increase the number of women in leadership roles (Dragomir 2018). This is especially true for large governmental and unionized organizations that have the resources to create meaningful change (Dragomir 2018).

The present findings show that we understand women are capable maritime leaders, but not enough action is taking place in recruiting, educating, and training women seafarers. Misogyny within the industry is the largest barrier keeping women from achieving their

potential. Women in roles of power will significantly impact all current barriers and solutions outlined above, but this can only be achieved with the deliberate practice of new policies that require gender balance.

A strength of this study was that a lot of different content was reviewed. Based on this, major findings were established, and a wide variety of ways to improve upon women representation in the marine industry was discovered. However, a limitation of this review was the lack of in-depth review on one of the eight particular limitation or facilitator to women within the marine industry. For future research it would be important to focus on one of the major themes identified in this review and conduct an in-depth project to strengthen findings. More knowledge on a particular theme would allow for real world changes to be implemented.

Moving forward requires developing and implementing programs and interventions to educate the industry about gender equality. Larger organizations investing time, money, and effort will be needed to achieve a significant outcome that will trickle down to smaller organizations. This development will allow for women's voices to be heard and followed on a larger scale. Women leaders are essential in recruiting younger women to entry-level jobs, and in previous research has shown that hiring women into leadership positions helps to positively associate women with characteristics that are critical for leadership success (Asher et al. 2022). Women need to be creating team objectives and directing the directions of maritime organizations leading to policy changes developed by women to implement new strategies to include and welcome more women in maritime recruitment.

A strong place to invest would be in developing more women within marine academia and offering more graduate positions specifically for women. This would enable the development of more female educators, and help demonstrate women as leaders to the next

generations of seafarers, allowing the opportunity for women to educate the industry, and society on the topics of equality, equity, and justice. This would create a snowball effect where this eventually will allow for other factors to change, creating a more welcoming environment for all. It is important for marine corporations to develop relationships with educational institutions that create recruitment opportunities for women and help develop a clear path for women interested in this industry.

While this review did not reveal any specific or immediate solutions, it highlights the importance of women leaders stimulating change in order to decrease the gender gap. To change institutional norms, it must first be agreed that women hold value as leaders. To make a meaningful impact on the overall quality of life for lower-rank women seafarers there must be a significant number of respected women in power.

In summary, a scoping review of women seafarers highlighted barriers and successes for women seafarers over the past 25 years in order to understand future-oriented goals for improving women's current working situation. The majority of research in this field relates to institutional development and policy change. While this review utilized a Canadian perspective to organize and present the data, the methodology and results should be applicable to the international education community and may help mobilize maritime educators, administrators, and national agencies toward the implementation of best practices.

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3.6 Tables

Table 1. List of all publications divided into their respective themes following the scoping review.

<p>(1) Struggle for Equal Opportunity</p>	<ul style="list-style-type: none"> ● Both genders will perform properly onboard with no significant difference (Cojocarú et al. 2018). ● Seafaring often reflects masculine norms and values which could affect women seafarers' behaviour and attitudes (Kitada 2013). ● Dependent on skilled labour and entrepreneurship which most women in Nigeria's oil are deficient (Uduji, Okolo-Obasi, and Asongu 2020). ● Unequal power relations established specific roles for women (Kwok et al. 2020). ● Underscores that programs may underachieve in terms of gender equality and women's empowerment (Cole et al. 2020). ● It is possible to see some resource- and policy-related shifts occurring (Gerrard and Kleiber 2019). ● Consensus was considered more important than male or female dominance in decision-making (Lawless et al. 2019). ● Power in men and male leaders (Rohe, Schlüter, and Ferse 2018). ● Particular fishing spaces and practices are gendered (Gustavsson and Riley 2018). ● Women were less likely than men to report that the MPA had a positive effect on their fishing (Kleiber, Harris, and Vincent 2018). ● Women still did not have control of the catch (Uc-Espadas et al. 2018). ● Locally relevant measures of power, class, and sex are pivotal in understanding why people adapt (Novak Colwell et al. 2017). ● The seascape and associated resources are gendered (Torre-Castro et al. 2017). ● Fishing networks are gendered (Arya, Trakroo, and Tewari 2017). ● Lack of a proper safety equipment for women (Forsell et al. 2017) ● Less family education level resulting difficult access to good job (Febri et al. 2017). ● Research methods perpetuate biased sampling that overlooks women's fishing (Kleiber, Harris, and Vincent 2015).
<p>(2) Education and the Development of Women Leaders</p>	<ul style="list-style-type: none"> ● Maritime education and training is crucial for shaping future gender and culture-sensitive seafarers (Belev et al. 2020). ● Leveraging inclusive education is a tool for promoting gender equality (Mahabir-Lee and Rambarath-Parasram 2020). ● Girls can learn the required theories at college when they are cadet and improve their skill on board ship (Yousefi 2009). ● Female seafarers entering traditional male jobs had a high risk of fatal accidents at sea and ashore (Holmgren 1998). ● Women need to be put in roles of power (Uduji and Okolo-Obasi 2020). ● Women have engaged in fisheries through family operations (Szymkowiak and Rhodes-Reese 2020). ● Diversity was influenced by social, cultural, demographic and geographic factors (Pakkanna, Rasulong and Akhmad, Wahjono 2020). ● The ability of women to work on an equal footing with men in a previously purely male profession (Belev et al. 2020). ● Building management tools for women who are actively involved in the management of marine resources (Michalena et al. 2020). ● Development of gender awareness capacity building (Stacey et al. 2019). ● Many prejudices and a lack of awareness about working in the field of shipping can affect women (Roos 2018). ● Heightening the women fish driers' awareness about the nexus and strengthening of their roles (Sumagaysay 2017), ● Women's contribution to the well-being and resilience of Oregon's evolving commercial fishing industry (Calhoun, Conway, and Russell 2016). ● Training and credit should be made available to females (Musa, Aura, and Kundu 2016). ● Fieldwork and interviews with women who have been or still are active fishers and owners of small and large fishing boats (Gerrard 2016). ● Both analysis and emotions are not identical for women and men. (Lebel and Lebel 2017).

<p>(3) Sustainability of Industry</p>	<ul style="list-style-type: none"> ● Women and men shared the same views about harvesting (Purcell et al. 2020). ● Women needed in the field of care and management, and in the extraction of fish (Tilley et al. 2020). ● The high involvement of women in small-scale fisheries, and their contributions to household food security (Rabbitt et al. 2019). ● Women needed to increase adoption and participation, negotiate trade-offs, improve environmental conditions. (Call and Sellers 2019). ● Social innovation to improve gender relations may hold promise for enabling fishery-dependent people (Cole et al. 2018). ● Enhance women's full participation and equal benefits from ecosystem services (Nagoli, Binauli, and Chijere 2019). ● The associations suggest that overfished fisheries should retain traders with low education, capital, and savings ((McClanahan and Abunge 2017). ● Gender sensitive research can help to ensure that the conditions for achieving sustainable development goals (Koralagama, Gupta, and Pouw 2016).
<p>(4) Sexual Harassment</p>	<ul style="list-style-type: none"> ● Filipino women seafarers have decided to organise to fight sexual harassment (Tangi 2020). ● A zero-tolerance policy has to be strongly asserted in order to realize a work environment free from discrimination (Carballo Pineiro and Kitada 2020). ● Shipping companies should develop and implement high profile policies on sexual harassment (Thomas 2006). ● Confidential access to the ship's doctor is vital (Thomas 2003).
<p>(5) Policy Change</p>	<ul style="list-style-type: none"> ● Shipping companies prefer male seafarers to females due to the perceived risk factors in relation to gender (Kitada and Langaker 2017). ● The Maritime Labor Convention should be updated with gender requirements (Dragomir and Popa 2017). ● The role of the International Labour Organisation (ILO) for reducing the world maritime gender gap (Dragomir and Popa 2017). ● New state policy concerning gender equality in university recruitments (Zhao et al. 2017). ● How to transform towards gender-inclusive employment (Kitada and Langaker 2017). ● Simple and low-cost interventions might improve the health and welfare of women seafarers (Stannard et al. 2015). ● A zero-tolerance policy has to be strongly asserted in order to realize a work environment (Carballo Piñeiro, and Kitada 2020). ● The dynamics of women's participation is an important lens for evaluating potential policy (Szymkowiak 2020). ● All the relevant authorities need to strictly ban chemicals as it is affecting women's livelihood substantially (Ameyaw et al. 2020). ● Achieving the aims of protecting women's rights and empowering women in offshore and onshore maritime industries (Kormych 2020). ● Language intuition and make the women's role transparent and recognized (Pejović 2020). ● For empowerment women must also be able to participate in meetings, be free to voice their opinions, and vote on the same terms as men (Torre et al. 2019). ● The Japanese law and the practice of: "one member per household.", which is traditionally reserved for men (Soejima and Frangoudes 2019). ● Fishery policies, fishery cultures and women's and men's actions in fisheries are not stable (Frangoudes, Gerra, and Kleiber 2019). ● A greater appreciation of power relations is required to further develop (Wosu 2019). ● The seesaw battle between occupational gender-equality awareness and the shipping market mechanism (Guo 2019). ● The Maritime Labor Convention should be updated with gender requirements, (Dragomir, 2018). ● Women forming unions (Gallardo-Fernández, and Saunders 2018). ● Policy makers and practitioners' interpretations (Agarwal 2018). ● It is necessary to reduce the structural, and systemically- embedded hurdles (Gissi, Portman, and Hornidge 2018). ● Impacts of state livelihood programs on women's work (Aswathy, and Kalpana 2018). ● Gendered inequalities in conservation decision making, and whose interests are served by conservation projects (Baker-Médard 2017). ● A total of 63.9% of women had occupational health problems compared to 48.5% of the men (Tripathi, Kamath, and Tiwari 2017). ● Fishery policy makers need to better recognize the diverse roles and perspectives of men and women in fisheries (Santos 2015)

<p>(6)Female Leadership</p>	<ul style="list-style-type: none"> ● Barriers will be potentially removed with implementation of automation technology (Kim et al. 2019). ● Employees in the maritime industry might have lower expectations towards female leaders (Fjærli, Nazir, and Øvergård 2017) ● Shell is committed to increasing the pipeline of STEM professionals, especially among those groups, like women (McCloskey 2015). ● The need for gender- integrated instruments in national fisheries monitoring and management (Tilley et al. 2020). ● Making visible contributions by women to food and livelihood security, globally (Harper et al. 2020). ● The National Maritime and Fisheries Community Empowerment Program (PNPM-MKP) (Ginting and Siregar 2020). ● The leadership of the fish processing fisherwoman (Sipahutar et al. 2019). ● For the women of Petatán give more value to the job and higher levels of individual bargaining power (Pedroza-Gutiérrez 2019). ● Increasing the political role of women in terms of leadership, community organizations, and disaster management (Riviwanto and Basuki 2017). ● Women's knowledge may be critical in fisheries management decisions (Lavoie et al. 2019). ● Fisherwomen are even more so since their voice is rarely heard and their work is unseen (Salmi and Sonck-Rautio 2018). ● Conclusions have shown that both genders will perform properly onboard, with no significant difference (Cojocarú et al. 2018). ● Being a female has helped me some to have a good career, possibly because they were not trying to copy male attitudes (Morales-Nin 2018). ● Women in fisheries could be attributed to ownership of fishing equipment and empowerment activities (Limuwa and Synnevåg 2018). ● The way community development initiatives are conceived, implemented, and supported (Mutimukuru-Maravanyika et al. 2017). ● Women who comprise the focus of this study appeared to be completely invisible to government fisheries management bodies (Lokuge and Hilhorst 2017). ● Revealing ambiguities in the meaning of changes in gender relations (Locke et al. 2017). ● Leadership identity that appeared to be gendered (Kitada 2017). ● Characteristics of outstanding leaders showed no difference between female and male leaders (Fjærli, Nazir, and Øvergård 2017). ● Women changed their behaviour towards lower extractions (Revollo-Fernández et al. 2016). ● Three identified conservation improvements when women participated in the management of the resources (Leisher et al. 2016).
<p>(7) Employment opportunities</p>	<ul style="list-style-type: none"> ● A series of recommendations are outlined in order to promote the recruitment and retention of women at sea (Thomas 2004). ● Rural women to be financially rewarded for their participation in fisheries (Uduji and Okolo-Obasi 2020). ● Presence of women has a positive outcome on several social and economic indicators (Liontakis et al. 2020). ● Relationship between the fishing community, including women in fisheries, and the government has been variable throughout the years (Neilson 2019). ● Logistic regression analysis showed that the most influential variable result was the length of work (Irnawati et al. 2019). ● Challenges of economic barriers, access to fisheries resources and policy (Bradford and Katikiro 2019). ● Unfortunately, women's roles in supporting family economy are still underestimated till now (Nurbayani, Anggun, and Wulandari 2019). ● Women manage working in one of the least respectable forms of female employment in Kerala (Aswathy and Kalpana 2019). ● The roles and perceptions of their jobs, since being satisfied with work can influence overall quality of life (Yingst and Skaptadóttir 2018). ● Industry has potential for reducing poverty and enhancing economic empowerment of women (Forkuor, Peprah, and Alhassan 2018). ● Recognition and empowerment - strengthening their chances of negotiating (Nathenson et al. 2017). ● The involvement of both genders in seaweed farming needs recognition and both need to be taken seriously (Fitriana 2017).

	<ul style="list-style-type: none"> ● Of all women, 5.2 million (70 %) were engaged in the fishery sector and 2.3 million (30 %) in the aquaculture industry (Bacher and Gee 2017). ● Increased awareness and better capacity building initiatives have played a part in increasing women’s participation (Siddiqa, Haque, and Barman 2017). ● Important roles in addressing poverty and food security issues (Iguban, Andres, and Ferrer 2017). ● To increase women participation in mariculture, women stereotypes need to be overcome (Francisco et al. 2017). ● Access, control and ownership of financial, physical and productive assets enable people to create stable and productive lives (Cohen, et al. 2016). ● The vital role of women in the Scottish herring and the Newfoundland cod fishery (Máñez and Pauwelussen 2016).
(8) Education of Society	<ul style="list-style-type: none"> ● Women still represent a novelty on board ships (Pejović 2020). ● The restriction of mobility could be linked to the processes of pregnancy, childbirth and breastfeeding (Di Carlo 2019). ● Personnel willing to give and share their knowledge to their colleagues, simplify and clearly transfer their knowledge to colleagues (Kitada 2019). ● The merchant vessel remains to be a man’s world (Acejo and Abila 2016). ● Priorities for preventive action include alcohol related disorders in male seafarers (Coggon et al. 2010). ● School currently does little to challenge the gender regimes and sustained masculine structures (Walker, Gleaves, and Peart 2003). ● The development of guidelines, tools and training programs (Mangubhai and Lawless 2021). ● How men can contribute more to running their households (Torell et al. 2019). ● Women have not overcome the cultural norms (Singleton et al. 2019). ● The gendered process offers a number of lessons for environmental scholars and practitioners (Siegelman, Haenn, and Basurto 2019). ● Globalization in the fisheries plays out differently for men and women in different fishing communities (Hapke and Ayyankeri 2018). ● Findings discuss women and minorities (Arismendi and Penaluna, 2016). ● Greater female expatriate participation could be achieved in the high expatriate usage sectors (Shortland 2016).

3.7 Figures

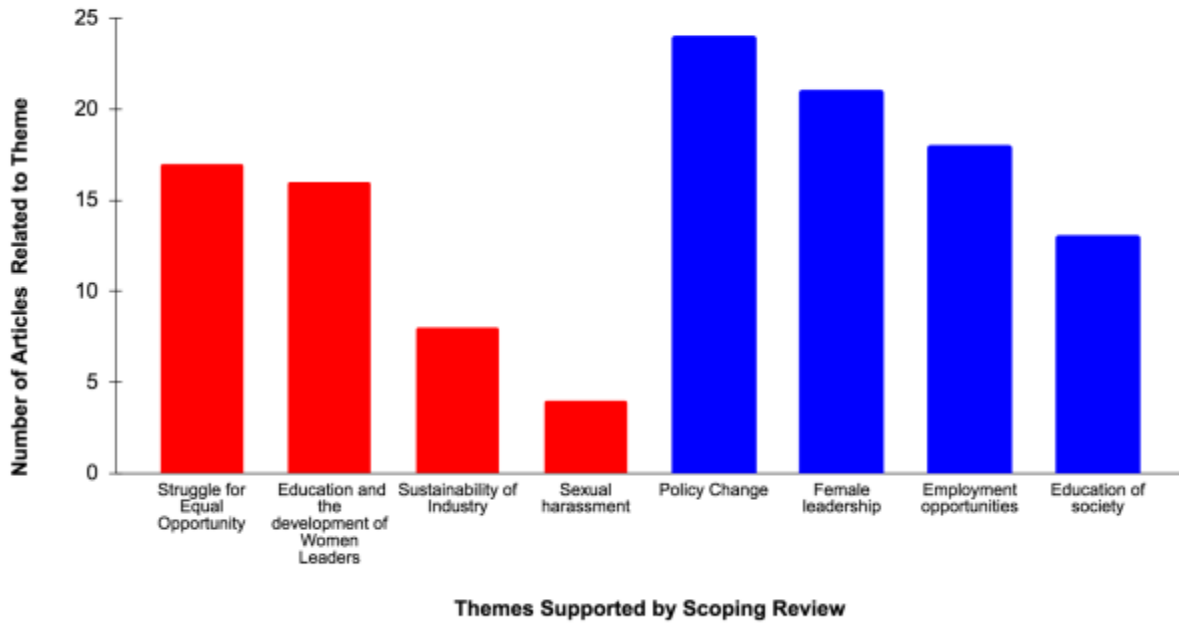


Figure 1. These are the eight themes developed to identify barriers (red) and facilitators/positive outcomes (blue) to women being represented within the marine industry. The number of articles for each theme are represented in each bar.

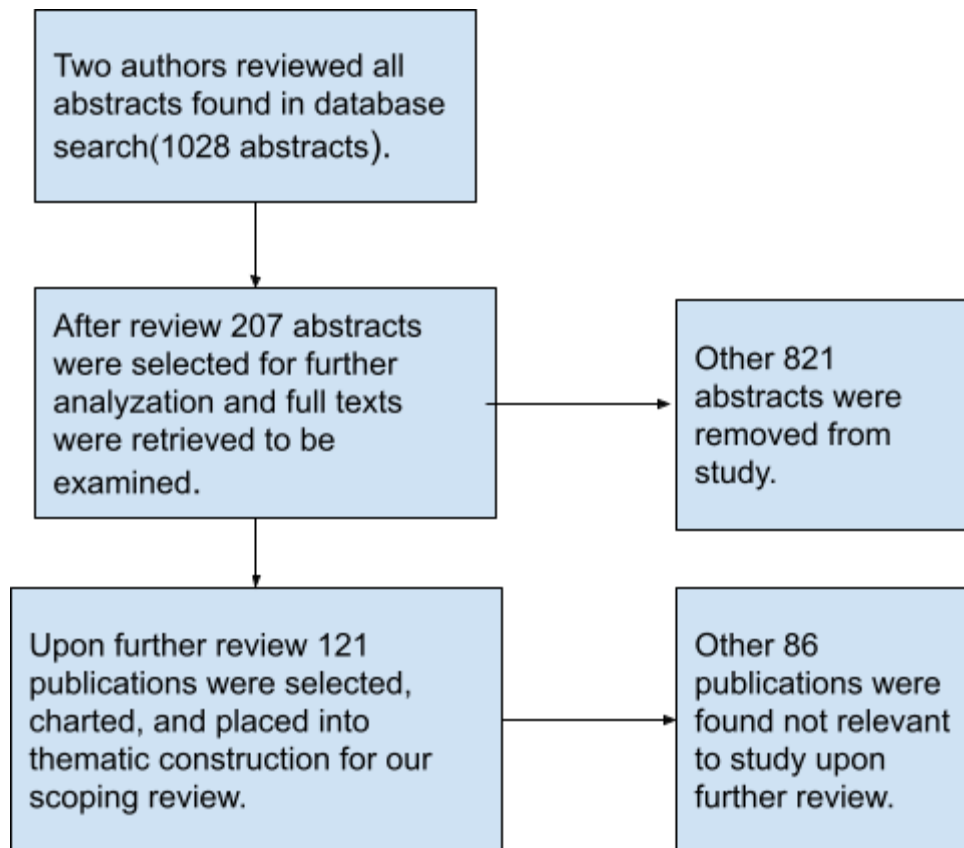


Figure 2. Outline of the process utilized to determine relevant papers for the scoping review.