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Gender Bias Assessment in Project Implementation Framework

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Abstract: This study addresses the persistent issue of gender bias in project management by developing and validating a practical survey tool for monitoring gender-related perceptions within project implementation frameworks. Using a Knowledge, Attitudes, and Practices (KAP) approach, a survey instrument was designed to assess awareness of gender equity policies, perceptions of inclusivity, and experiences related to sexual harassment (SASH) within project teams. The tool was piloted in a Horizon Europe project (Healthy Sailing), with responses collected from 66 participants (academics, maritime professionals, researchers, and government stakeholders). Exploratory Factor Analysis (EFA) revealed a five-factor structure explaining 72.29% of total variance, with the two dominant factors—Perceived Gender Bias and Organizational Safety—demonstrating excellent internal consistency (Cronbach's alpha > 0.90). Confirmatory Factor Analysis (CFA) and bifactor modeling indicated areas for further refinement, with RMSEA values exceeding optimal thresholds. The results underscore the potential of the KAP-based tool to support gender-sensitive quality management practices in project-based environments, while highlighting the need for ongoing psychometric validation. The study contributes a novel, empirically grounded instrument for promoting inclusivity and equity in project management.

Keywords: gender policy; SASH policy; project management; human resources

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1. Introduction

Despite project management being one of the fastest-growing professions globally, with over 90 million individuals expected to work in project-based roles by 2030, gender inequality remains a structural reality. Women make up nearly half of the global workforce, yet they continue to be underrepresented in senior project leadership roles, particularly in industries like construction, IT, and engineering [1]. Their journeys through project hierarchies are often punctuated by bias, exclusion, and invisible ceilings. Studying gender in project management is not just a matter of representation; it is a matter of performance, ethics, and sustainability. Projects shape infrastructure, technology, healthcare systems, and public services; they are the engines of societal transformation. When leadership structures within these projects exclude or undervalue half the population, the outcomes reflect a narrow, incomplete perspective. Moreover, projects are inherently human enterprises. They require negotiation, empathy, conflict resolution, and cultural intelligence—all competencies where research consistently shows that women often excel [2,3]. Yet, women continue to be less likely to be assigned high-visibility, strategic projects, a phenomenon sometimes referred to as the "glass wall", keeping women in support roles rather than leadership pipelines [4]. By studying gender disparities in project environments, we gain more than data; we unearth a cultural blueprint of how power is distributed, how success is measured, and whose voices get amplified in moments of crisis or innovation. Women, according to

multiple studies, tend to lead with transformational, participatory, and emotionally intelligent styles—skills linked to higher project team morale and stakeholder satisfaction [5,6]. Organizations that recognize and empower female project leaders outperform on key performance indicators, including project ROI, employee engagement, and innovation scores [1]. Yet, despite these gains, the gender gap remains wide, especially at the program and portfolio management levels.

Moreover, project management has rapidly evolved from a technical coordination role into a complex, multidisciplinary leadership function. As organizations worldwide increasingly depend on projects for strategic growth, the competencies of project managers have expanded to include not only technical expertise but also emotional intelligence, stakeholder negotiation, and inclusive decision-making [3,6]. However, despite these shifts, gender disparities persist, particularly in leadership roles within the project management profession. The historical underrepresentation of women in project management is not merely a numerical imbalance; it reflects broader social structures, organizational cultures, and leadership expectations rooted in masculine norms [7]. While female representation has grown over the past two decades, especially in sectors like healthcare and education, women continue to face barriers in high-tech and engineering-based project environments [8].

In response to these challenges, several organizations and institutions have introduced diversity, equity, and inclusion (DEI) strategies to foster women's advancement in project management. Professional bodies such as the Project Management Institute (PMI) have published gender-specific research and launched initiatives like Women in Project Management (WiPM) chapters globally [5]. Moreover, companies that implement gender-sensitive project allocation and leadership training programs show higher levels of innovation and project performance [1] (Governments in the EU, Canada, and Australia have also mandated gender quotas in public procurement and infrastructure projects, forcing a rethink of traditional leadership structures.

While macro-level studies have identified broad gender trends in management, there remains a lack of micro-level, survey-based research specifically addressing the experiences, perceptions, and career trajectories of women in project management roles. This research aims to open a broader investigation, anchored in a survey-based study, seeking to explore the lived experiences of women in project management. The research focuses on several critical questions regarding the obstacles women face in accessing project leadership opportunities and how organizational cultures support or hinder gender equity in project assignments. By quantifying and contextualizing these questions, this research aims not only to contribute to academic discourse but also to provide evidence-based recommendations for employers, industry bodies, and educators committed to dismantling gender barriers.

The remainder of this paper is structured as follows. Section 2 presents a comprehensive literature review and highlights the existing research gaps on gender aspects in project management. Section 3 introduces the research framework, including the relevant policy background and alignment with prior studies. Section 4 describes the research methodology and details the development and structure of the survey instrument. Section 5 reports on the validation of the measurement tool, including exploratory and confirmatory factor analyses. Section 6 presents the findings of the pilot case study conducted within the Healthy Sailing Project. Finally, Section 7 summarizes the key conclusions, discusses practical implications, and outlines directions for future research.

2. Literature Review

2.1. Gender Issues in Project Management

Extensive literature supports the notion that women bring distinctive leadership strengths to project environments, with studies often describing women as more transformational, collaborative, and communicative compared to their male counterparts [2,3]. These traits have been increasingly associated with project success, especially in dynamic, cross-functional, and team-based settings. For instance, Müller and Turner found that projects led by transformational leaders—many of whom were women—demonstrated higher stakeholder satisfaction [3]. Moreover, women project managers tend to emphasize inclusive communication, risk aversion, and ethical governance, attributes increasingly valued in agile, stakeholder-centric project paradigms [5]. Despite these strengths, women in project management face a range of systemic barriers that limit their upward mobility and influence, including:

- Gender stereotyping: women are often perceived as less competent in technical or high-risk projects [9];
- Glass ceiling and sticky floors: many women remain in junior roles due to lack of mentorship or organizational bias [8];
- Work-life conflict: project deadlines, travel requirements, and irregular hours often conflict with social expectations around caregiving [10].

Additionally, there is evidence that women are less likely to be assigned strategic projects, the very assignments that provide visibility and career advancement opportunities [4].

The intersection of gender and project management is a burgeoning field of research, exploring the unique challenges, opportunities, and contributions that women bring to project-based work [11,12]. Although project management has evolved significantly, women continue to be underrepresented, especially in leadership roles. According to the Project Management Institute, only 29% of project managers globally are women, and even fewer occupy executive-level positions [13,14]. This gap is attributed to systemic barriers such as gendered organizational cultures, lack of mentorship, and limited access to strategic assignments [13,15]. Buckle and Thomas highlight that leadership in project environments often defaults to masculine norms, valuing assertiveness over collaboration, traits stereotypically not associated with female leadership [16]. Moreover, recent findings indicate that gender bias affects not only hiring and promotions but also performance evaluations [1].

To address these issues, Kitada and Langåker recommend embedding gender mainstreaming into institutional policy, while other authors argue for gender-sensitive leadership training [17]. The need for culturally contextual strategies is emphasized in Quinteros, who finds that gender dynamics vary widely across regions and sectors, particularly in international or EU-funded projects where diversity is legally mandated but inconsistently practiced [18,19].

2.2. Key Themes in Prior Research

The literature review revealed the following key themes in existing knowledge on the gender subject [16–20]:

1. Underrepresentation of women in project management:
    - Statistical evidence: studies consistently point to a gender imbalance in project management roles, with women often occupying lower-level positions or being underrepresented in leadership roles;

- The contributing factors for this under-representation are stereotypes, biases, and systemic barriers that can hinder women's advancement in the field.

2. Gendered stereotypes and biases:
   - Traditional masculine norms: the project management profession has historically been associated with masculine traits like assertiveness, decisiveness, and risk-taking and these stereotypes can disadvantage women who may be perceived as less suitable for leadership roles;
   - Implicit bias refers to the unconscious biases that can influence hiring, promotion, and evaluation decisions, leading to discriminatory practices against women.
3. Challenges faced by women project managers:
   - Work-life balance: women often bear a disproportionate share of domestic responsibilities, making it difficult to balance work imperatives and personal life variables, and this aspect can hinder their career progression and limit their opportunities for advancement;
   - Glass ceiling—many women in project management encounter a "glass ceiling", where they face invisible barriers that prevent them from reaching higher-level positions;
   - Gendered language and communication styles—the use of gendered language and communication styles can create a hostile work environment for women.
4. Contributions of women to project management:
   - Diverse perspectives: women bring unique perspectives and problem-solving approaches to project management, which can enhance team effectiveness and project outcomes;
   - Empathy and collaboration: women are often perceived as more empathetic and collaborative leaders, which can foster positive team dynamics and improve project success.
5. Strategies for promoting gender equality in project management:
   - Diversity and inclusion initiatives: organizations can implement policies and programs to promote gender diversity and inclusion in project management;
   - Mentorship and sponsorship—mentorship programs can provide women with guidance, support, and opportunities for professional development;
   - Flexible work arrangements—offering flexible work arrangements, such as remote work or flexible hours, can help women balance their work and personal responsibilities.

The key themes in gender analysis within project implementation literature include "gender-sensitive evaluation frameworks", "integration of gender perspectives in project design", and "addressing power dynamics in gender relations". These themes highlight the importance of developing comprehensive evaluation methods, ensuring gender considerations are embedded in project planning, and recognizing the influence of power structures on gender equity [21].

2.3. Limitations in Existing Approaches

Despite the growing body of research on gender aspects in project management, several areas remain understudied or with uncertain influence regarding the effective insertion of gender-balanced policies within project implementation frameworks [12,14,20]. Following the research results and literature review conclusions [11,20], the authors have identified the following research gaps and potential research topics for future focus:

- Specialized studies are very relevant to be conducted on a larger scale under a quantitative analysis perspective to provide more robust evidence of gender disparities in project management [12];
- Cross-cultural comparisons are important to reveal how gender dynamics in project management vary across different cultural contexts, with a special focus on European Union-funded projects [22] (EU Union of Equality report "2023 Report of Gender Equality in European Union");
- Examining the intersection of gender with other factors, such as race, ethnicity, and socioeconomic status, would be very valuable in order to promote understanding of the complex experiences of marginalized groups [23];
- The impact of gender diversity on project outcomes calls for investigating the relationship between gender diversity in project teams and project success [24].

The literature on gender aspects in project management highlights the significant challenges faced by women in this field. By addressing these challenges and promoting gender equality, organizations can create more inclusive and equitable workplaces that benefit everyone [25]. Future research will be essential for deepening our understanding of these issues and developing effective strategies for change [26].

2.4. Research Gap and Contribution

In summary, the literature on gender analysis within project implementation emphasizes the necessity of gender-sensitive evaluation frameworks, the integration of gender perspectives in project design, and the critical examination of power dynamics affecting gender relations. These themes collectively underscore the importance of a holistic approach to gender equity in project implementation, ensuring that interventions are effective and inclusive.

In this context, the authors have identified the importance of a practical tool that would help project managers assess, during project implementation, the gender policy and diversity management effectiveness, supporting the implementation of a concluding output of the project consisting of a gender analysis report as a quality management indicator to be considered and ongoing reported.

3. Research Framework

3.1. Policy Framework

As stated in the "Union of Equality: EU gender equality strategy 2020–2025" enforced by COM (2020)/152/5.3.20, "…working together, we can make real progress achieving a Europe where women and men, girls and boys, in all their diversity, are equal—where they are free to pursue their chosen path in life and reach their full potential, where they have equal opportunities to thrive, and where they can equally participate in and lead our European society" [27]. In this spirit of community gender statement, the EU has made significant progress in gender equality policy settlement over the last decades, promoting equal treatment legislation, gender mainstreaming, the integration of the gender perspective into all other policies, and specific measures for the balanced and fair advancement of women in social, cultural, and economic frames. The EU Gender Equality Strategy 2020–2025 delivers the Commission's commitment to achieving a Union of Equality. This strategy outlines policy objectives and actions aimed at fostering a gender-equal Europe—a Union where individuals, regardless of gender, can freely pursue their chosen paths in life, have equal opportunities to succeed, and can equally participate in and lead European society [27].

Depicting this framework, the key objectives toward the gender agenda achievement would include combatting gender-based violence, overcoming gender stereotypes, closing

gender gaps in the labour market, ensuring equal participation across various sectors of the economy, and addressing gender-based payment disparities. The European Union strategy aims at a dual approach of gender mainstreaming combined with targeted actions, with intersectionality serving as a horizontal principle for its implementation (COM (2020)/152/5.3.20: Union of Equality: EU gender equality strategy 2020–2025) [27].

As a research methodology, the authors pursued a wide study of the European Union gender legal framework, and the major identified references that were considered in the present study and further in the gender survey tool design are the following community deeds and provisions (see the references, **legal framework*):

1. "Union of Equality: EU gender equality strategy 2020–2025" COM (2020)/152/5.3.20 [27];
2. Directive 2002/73/EC of the European Parliament and of the Council of 23.09 2002 amending Council Directive 76/207/EEC on the implementation of the principle of equal treatment for men and women as regards access to employment, vocational training, and promotion, and working [28];
3. Directive 2006/54/EC of the European Parliament and of the Council of 5.07.2006 on the implementation of the principle of equal opportunities and equal treatment of men and women in matters of employment and occupation (recast), 2006, OJ L 209/23 [29];
4. EU Charter of Fundamental Rights (i.e., Articles 21 and 23) [30];
5. EU Union of Equality reports—"2023 Report of Gender Equality in European Union" [22];
6. Directive (EU) 2019/1158 on work-life balance for parents and carers;
7. EU Strategic Approach to Women, Peace and Security (WPS) annexed to the Foreign Affairs Council Conclusions on WPS adopted on 10 December 2018, (Council document 15086/18) (https://www.consilium.europa.eu/media/37412/st15086-en18.pdf, accessed on 1 March 2025) [31];
8. EU Action Plan on Women, Peace and Security (WPS) 2019–2024/4 July 2019 EEAS (2019) 747 [32];
9. United Nations—Sustainable Development Goals, Goal 5: Achieve gender equality and empower all women and girls (https://www.un.org/sustainabledevelopment/gender-equality, accessed on 1 March 2025) [33].

Therefore, considering the European Union imperatives and foreseen balanced gender policies and aiming at the survey outlines development, the gender analysis objectives considered by the authors in the present study were the following:

- Specific provisions are very relevant and highly recommended to be inserted in the project quality management plan for ongoing non-discrimination monitoring and gender balance analysis as required tools in achieving diversity management equity;
- In line with enhancing feasible tools for project implementation, KAP surveys are recommended to be applied to all project stakeholders during project implementation or during organized events and activities in order to identify the gender non-discrimination policies among project team members and researchers;
- The gender policy monitored through specific tools will permit the ongoing evaluation of Sexual Assault and Sexual Harassment (SASH) Policy implementation in the project implementation framework and consequently will facilitate the timely identification of potential illegal events on this matter;
- The quality management tools will facilitate the study of gender impact on project team member behaviour and personal performance assessment for improving human resources effectiveness toward an improved range of results' quality;

- Applying a survey on project team members' knowledge, attitudes, and practices will enhance awareness regarding gender relevance in regard to procedure implementations, biases and risky behaviour assessment;
- Finally, concluding scientific study regarding gender-based differences in behaviours and risky behaviour could be effectively observed, overcome and reported.

3.2. Alignment with Previous Research

This study seeks to offer a pioneering approach to addressing gender bias and inclusivity within project implementation frameworks by introducing a KAP-based survey instrument specifically validated within an EU-funded project context. The study findings both reinforce and extend the existing literature on gender disparities in project environments, while providing a concrete, scalable tool for real-time monitoring of gender-related attitudes and practices.

The outcomes of the developed survey echo a well-established body of literature asserting that women in project management face persistent structural barriers, including bias in task allocation, limited access to strategic roles, and subtle forms of workplace discrimination [1,8,9]. For example, the presence of undecided or ambivalent responses concerning harassment and task fairness suggests the existence of latent biases and unclear institutional communication, a finding consistent with previous studies that describe underreporting of gendered incidents [12,19].

The gendered perception gap, particularly visible in attitudes toward pay equity and promotion opportunities, parallels research by Turner and Buckle and Thomas, who note how male professionals often underestimate the prevalence or impact of gender bias in the workplace [15,16]. The study findings reinforce the "perception disconnect" whereby men report more optimism about gender equity than their female counterparts, a well-documented barrier to advancing institutional change.

While much of the existing research has relied on broad statistical overviews or qualitative interviews the present study advances the field by operationalizing a survey-based monitoring tool grounded in the KAP (Knowledge, Attitudes, Practices) framework [17]. The KAP model allows for real-time, empirical analysis of gender-related behaviors and perceptions at multiple levels of a project—a novel methodological advancement for both academia and practitioners. Importantly, this is among the first studies to integrate SASH (Sexual Assault and Sexual Harassment) policy awareness into a project quality management framework, aligning operational compliance with ethical and performance-oriented goals, this aspect being rarely addressed in earlier gender-mainstreaming tools.

Although the EU Gender Equality Strategy 2020–2025 mandates inclusive practices in publicly funded projects, our study confirms earlier critiques (e.g., [21]) that show a disconnect between institutional mandates and workplace reality. By embedding gender monitoring into the quality assurance process, this tool may bridge this gap, offering measurable, ongoing diagnostics rather than post-hoc audits or compliance reports.

3.3. Research Objectives

This study aims to develop, implement, and validate a gender-sensitive survey tool, based on the KAP framework, to be embedded in project quality management systems. The focus is to assess the effectiveness of gender policy integration and identify latent gender biases within project implementation frameworks, particularly in EU-funded initiatives. By operationalizing gender equity principles into a measurable tool, the study responds to the identified gap between theoretical gender mainstreaming mandates and practical organizational practices, thereby contributing to both academic research and applied project governance.

To support the overarching aim, this study pursues the following specific objectives:

1. to design a gender bias assessment tool based on the KAP framework, tailored for project implementation contexts, incorporating indicators linked to knowledge of EU gender policies, individual attitudes toward inclusivity, and practices surrounding equality, harassment, and leadership dynamics;
2. to explore perceptions of gender equity among project stakeholders, including academics, maritime professionals, researchers, and authorities, in the context of team communication, task distribution, leadership representation, and SASH (Sexual Assault and Sexual Harassment) policies;
3. to validate the survey tool through a case study involving the Healthy Sailing Horizon Europe project, assessing its reliability and applicability within a real-world consortium working across diverse professional and cultural domains;
4. to analyze demographic and experiential factors (such as gender, experience level, or occupational background) that influence awareness and practices related to gender equity in project environments;
5. to align the instrument's analytical framework with EU directives and policy priorities;
6. to contribute empirically to the ongoing development of gender-sensitive quality management tools in project governance, promoting institutional transparency, ethical project delivery, and stakeholder engagement in line with European Commission mandates.

4. Research Method

4.1. Theoretical Frameworks Supporting the Survey Design

Despite increasing attention to gender equity in policy discourse and organizational management, the practical integration of gender perspectives within project implementation frameworks remains limited and uneven. This is especially true in sectors that are historically male-dominated, such as engineering, maritime industries, and research consortia, where diversity management is often reduced to compliance-based indicators rather than embedded cultural change [34,35]. Research consistently shows that gender biases persist in team dynamics, leadership evaluations, and promotional opportunities, even in high-skilled environments such as EU-funded research and innovation projects [12,19]. Moreover, female professionals often face disproportionate challenges including exclusion from decision-making circles, undervaluation of their contributions, and lack of visibility in project leadership roles [1,26].

While gender equality policies are mandated by major funding bodies like the European Commission under frameworks such as Horizon Europe and the EU Gender Equality Strategy 2020–2025, there is a notable gap in operational instruments that can effectively monitor, measure, and guide gender policy implementation at the project level [27]. Existing project quality management systems rarely include targeted tools to assess gender attitudes, workplace practices, or team member perceptions, leaving a disconnect between policy and practice [21].

In response to this gap, the present study introduces a KAP-based (Knowledge, Attitude, Practice) survey tool specifically designed to be embedded within the quality management framework of EU-funded projects. This instrument seeks to offer project managers and stakeholders a practical method for evaluating the level of gender awareness, equity practices, and the effectiveness of Sexual Assault and Sexual Harassment (SASH) policies throughout the project lifecycle. Through a pilot case study implemented in the "Healthy Sailing" Horizon EU project, this research provides initial validation of the tool and highlights critical areas for improving gender-sensitive project governance.

The survey instrument developed in this study is conceptually anchored in the Knowledge, Attitude, and Practice (KAP) model, a widely recognized framework in public health and social sciences used to explore how individuals internalize, respond to, and act upon institutional values, norms, and policies. Within the context of project management, KAP surveys have been successfully used to assess team dynamics, policy awareness, and behavioral compliance, especially in areas related to ethics, safety, and inclusivity [35–37]. Then, *knowledge* (K) refers to the respondent's awareness and understanding of gender equality mandates (such as EU directives and SASH protocols), *attitudes* (A) capture beliefs, perceptions, and values surrounding gender roles, professional equity, and inclusivity, while *practices* (P) assess how individuals are likely to behave in real-world scenarios involving gender discrimination, bias, or support for diversity initiatives.

Complementing the KAP model, the survey integrates principles from social role theory, which asserts that culturally ingrained gender roles significantly shape perceptions of leadership, competence, and authority in professional environments [34]. In project management, especially in sectors historically dominated by masculine norms, this theory explains persistent underrepresentation and the challenges faced by women in leadership roles [15].

To analyze workplace perceptions of equity and responsiveness, organizational justice theory was also applied [38]. This theory is crucial for evaluating the perceived fairness of procedures (procedural justice), interactions (interpersonal justice), and outcomes (distributive justice) within project teams. In project settings, organizational justice has been linked to improved employee commitment, trust in leadership, and team performance [3,39].

Additionally, the study draws from intersectionality theory, which provides a lens to understand how multiple identity factors, such as gender, ethnicity, seniority, or family responsibilities, interact to affect individuals' experiences within project environments [40]. This is particularly relevant for EU-funded international projects where diverse teams are the norm, and policy mandates require inclusive practices.

Lastly, the instrument reflects concepts from gender mainstreaming and diversity management literature in project contexts, which emphasize embedding equity principles in the planning, execution, and evaluation phases of project management [13,35]. Such integration is essential for fulfilling the EU Gender Equality Strategy 2020–2025 and for enhancing project outcomes through inclusive leadership practices.

The research process followed a structured sequence to ensure both conceptual clarity and methodological rigor. First, a Knowledge, Attitudes, and Practices (KAP)-based survey instrument was designed to capture gender-related perceptions and experiences within project management environments, drawing upon relevant literature and quality management frameworks. Second, the survey was disseminated to participants within the Healthy Sailing project consortium, targeting a diverse sample of professionals involved in project implementation. Third, data were collected and prepared for analysis. Fourth, a series of statistical validation procedures were conducted, including Exploratory Factor Analysis (EFA) to identify underlying factor structures, Confirmatory Factor Analysis (CFA) and bifactor modeling to test model fit, and reliability analysis using Cronbach's alpha to assess internal consistency. Finally, the results were interpreted in light of both statistical outcomes and theoretical considerations, with a view toward informing the refinement of the instrument and its application in project-based quality management contexts.

4.2. Gender Survey Tool for Quality Management Plan in Project Implementation Framework

The research model has been developed by the authors following the next methodology:

- a KAP survey has been developed as described below, to reveal the major knowledge, attitude and practices occurring in the project implementation framework;

- the survey has been applied based on a case study for validation, among the team members of the Healthy Sailing project consortium (HORIZON-CL5-2021-D6-01-12), to assess the gender non-discrimination attitudes and practices among the project team members, project professionals and researchers, as part of the project quality management charter;
- the survey has been focused mainly on EU gender policies and gender strategic views, to reflect and increase the project members' awareness;
- based on the developed survey and collected data, specific provisions have been identified and suggested to be implemented in the project quality management plan, regarding the non-discrimination and gender analysis.

The project selected for piloting the gender survey tool was the Healthy Sailing project (HORIZON-CL5-2021-D6-01-12), funded under the Horizon Europe program. The project scope focuses on promoting health, well-being, and safety in maritime transport environments through multidisciplinary research and training. The project consortium includes academic institutions, maritime industry stakeholders, port service providers, and governmental authorities across several EU countries. For this study, the survey was disseminated to project team members and relevant stakeholders involved in project implementation. A total of 76 questionnaires were distributed, and 66 valid responses were collected, yielding a response rate of 87%. The respondents represented a range of professional roles within the project, including academics and teaching staff (n = 23), researchers (n = 13), seagoing professionals (n = 12), experts in health services (n = 1), port industry experts (n = 5), ship services professionals (n = 5), maritime trainers (n = 2), and representatives from authorities and government bodies (n = 5). This diverse respondent pool ensured that the survey captured a wide range of perspectives across different organizational and functional roles within the project. However, the sample is subject to potential response bias. For instance, participants with greater awareness of or sensitivity to gender issues may have been more likely to complete the survey. Additionally, the gender distribution slightly underrepresents female professionals relative to the project's target population, which could influence the interpretation of certain findings. These limitations should be considered when generalizing the results.

The survey is mainly designed to explore the presence and impact of gender biases and inclusivity propensity within the project implementation framework, in relation to tangent stakeholders, offering a solid tool to identify eventual unwanted attitudes or misbehavior, as a relevant component of the quality management plan. Moreover, the developed questionnaire is also designed to analyze gender awareness for research/training/academic staff and professionals involved in the project team; consequently, the collected conclusions are to be included in the project quality management plan to facilitate the ongoing analysis of work environment quality. Not least, the KAP survey can be used to disclose the coherence and effectiveness of Sexual Assault and Sexual Harassment (SASH) policies and procedures implementation in project team performance.

Moreover, to ensure clarity and sensitivity when addressing Sexual Harassment and Sexualized Harassment (SASH), the survey introduction included a brief definition of SASH and explained the relevance of these questions to the study's broader aim of promoting safe and inclusive project environments. Specifically, participants were informed that 'Sexual Harassment and Sexualized Harassment (SASH) refers to any unwelcome conduct of a sexual nature, including verbal, non-verbal, or physical actions, that creates an intimidating, hostile, or offensive work environment.' The introduction emphasized that all responses were anonymous and confidential, and that participants could skip any questions they did not wish to answer. This approach was designed to foster informed participation and ethical data collection regarding sensitive topics.

Then, at the technical level of structural development, considering the operational imperatives required by a functional quality management system, the interrogative frame includes various targeted questions related to knowledge, attitudes, practices or experiences associated with diversity management, work environment climate, communication dynamics and disclosure of possible biases or incidents related to gender. The main groups of items approached in the survey framework have been focused on the following analytical rationales:

- To assess gender and diversity policy awareness among team members, as part of the quality management system to assess work environment effectiveness;
- To identify the level of awareness, knowledge, attitudes and practices in the implementation of Sexual Assault and Sexual Harassment (SASH) policies and procedures in project implementation, in compliance with the European Union legal framework and in line with the provisions of "Union of Equality: EU gender equality strategy 2020–2025" COM (2020)/152/5.3.20;
- To reveal team members' perceptions, attitudes and biases regarding the female role as a team member;
- To assess the role of female leaders in the professional field, including for project management and scientific research projects, in different positions and assignments;
- To disclose if any cases of harassment, biases, prejudice, discrimination, or violence have occurred, or if the work environment in the project is affected by such actions.

4.3. Survey Design and Logical Structure

The survey instrument developed in this study was designed to assess gender awareness, attitudes, and practices within project implementation frameworks, with a specific focus on the operationalization of gender equity and Sexual Assault and Sexual Harassment (SASH) policies. Its logical structure follows the Knowledge, Attitude, and Practice (KAP) framework, widely adopted in organizational and health behavior research to systematically capture what respondents know (K), how they feel (A), and how they act (P) in relation to a targeted issue [36,37]. The survey was logically organized into two main parts, each serving a distinct analytical purpose (Appendix A):

- Part A—Demographic and Contextual Profile: this section captures respondent background variables to support disaggregated analysis and intersectional insights:
  - A1. Demographics (Items 1–6): covers occupation, gender identity, professional experience, contractual status, marital status, and caregiving responsibilities;
  - A2. SASH Policy Reactions (Items 7–8): presents hypothetical situations to assess respondents' likely behavioral responses to discrimination, both experienced and witnessed. This offers insight into existing reporting cultures and perceived institutional trust.
- Part B—KAP Assessment of Gender Equity and SASH Implementation: this is the core of the instrument, organized thematically to explore perceptions and behaviors relevant to gender dynamics and policy awareness in project contexts. Each subset employs a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), offering standardized data for interpretation.
  - B1. General Diversity Attitude (Items 1–9): Measures the cultural climate and interpersonal dynamics in relation to diversity and gender differences within the team environment;
  - B2. Diversity Practices (Items 10–14): Evaluates the observed behaviors of colleagues and institutions in promoting or impeding gender inclusivity;

B3. Gender Equality and Bias (Items 15–23): Assesses perceptions of gender-related barriers in task distribution, performance recognition, promotion, and leadership dynamics;

B4. SASH Policies and Procedures (Items 24–28): Focuses on awareness, trust, and perceived effectiveness of internal procedures to address sexual harassment, bullying, and gender-based misconduct.

Regarding the survey design principles, the structure enables triangulation between stated knowledge, observed behaviors, and institutional practices, using open- and closed-ended formats to enhance both quantitative rigor and qualitative depth. The survey is scalable and adaptable for use across various project settings, making it a versatile quality management tool for gender monitoring in EU-funded or industry-aligned project environments.

The target group is focused on the pool of project team members, in any position, but also on other stakeholders of the project involved or impacted by project implementation. The questionnaire uses the Likert scale, being considered by the authors the most suitable assessment methodology for the survey, to facilitate the measurement of survey participants' opinions, attitudes, motivations, and practices [37]. The scale uses in theory a range of answer options ranging from one extreme attitude to another, sometimes including a moderate or neutral option. Then, the authors have chosen 5 points of scale, with the following ranks of consideration for respondents: *a. Strongly disagree; b. Disagree; c. Undecided; d. Agree; and e. Strongly agree*.

The pilot study is exploratory but well-positioned to test specific hypotheses. Based on the research objectives and survey design, the following testable hypotheses are to be assumed:

H1. *Gender-based differences exist in the perception of inclusivity, bias, and equity in project implementation environments;*

H2. *Female respondents are more likely to perceive organizational inequities in promotions, task distribution, and recognition than their male counterparts;*

H3. *Project stakeholders with less than one year of experience are more proactive in responding to gender discrimination scenarios than more experienced staff;*

H4. *Awareness and perceived effectiveness of SASH policies are significantly correlated with respondents' gender and professional experience;*

H5. *There is a positive relationship between perceived gender inclusivity and the effectiveness of communication and collaboration within project teams.*

Each of these hypotheses is testable using the survey dataset (e.g., chi-square tests for association, *t*-tests or ANOVA for mean comparisons, or regression for predictors of inclusivity perceptions).

5. Investigation of Model Reliability

5.1. Measurement Tool Validation

To ensure the validity and reliability of the measurement tool developed for assessing psychological and organizational perceptions related to gender in maritime professional environments, a comprehensive statistical validation procedure was conducted. Following reviewer guidance and best practices in psychometric evaluation, the validation process included [41]:

- Exploratory Factor Analysis (EFA) for identifying latent constructs;

- Confirmatory Factor Analysis (CFA) to evaluate model fit;
- Cronbach's alpha for internal consistency assessment.

These procedures were applied prior to inferential analysis to establish the structural validity of the instrument and enhance the credibility of findings derived from it [42].

To ensure the validity and reliability of the developed survey instrument, a comprehensive psychometric evaluation was conducted using Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and reliability analysis. The statistical analyses were performed using Python v. 3.12.6 (with the semopy, pandas, numpy, and sklearn libraries) for CFA and reliability testing, and IBM SPSS Statistics (version 30.0.0) for EFA. The survey instrument comprised 27 Likert-type items. EFA revealed a five-factor structure. The number of items per factor in the final EFA solution was as follows: Factor 1 (Perceived Gender Bias and Inequity)—15 items; Factor 2 (Organizational Safety and Anti-Discrimination Measures)—8 items; Factors 3–5—1–3 items each, with low internal consistency and not retained for further interpretation. Factor loadings of $\geq$0.40 were considered meaningful for item inclusion, consistent with standard psychometric practice [41]. Cronbach's alpha values $\geq$ 0.70 were used as the threshold for acceptable internal consistency, with values $\geq$ 0.90 considered excellent [43]. These criteria guided the interpretation and reporting of the factor structure and reliability outcomes presented in this section.

5.2. Exploratory Factor Analysis (EFA)

To empirically examine the dimensional structure of the instrument designed to measure perceptions of gender bias and psychological safety in professional environments, an exploratory factor analysis (EFA) was conducted. This analysis aimed to uncover the latent constructs underlying the set of 27 Likert-type items in the questionnaire. Each item was phrased as a statement related to the respondent's experience or observation of gendered dynamics, with response options ranging from "Strongly disagree" (1) to "Strongly agree" (5). Prior to conducting the EFA, responses were numerically coded and screened for missing values; listwise deletion was applied to ensure a consistent sample of N = 66 valid cases.

5.2.1. Sampling Adequacy and Preliminary Tests

Before proceeding with factor extraction, it was essential to evaluate whether the dataset met the statistical assumptions necessary for factor analysis. To this end, the Kaiser–Meyer–Olkin (KMO) test of sampling adequacy was performed. The result yielded a KMO coefficient of 0.826, which exceeds the generally accepted threshold of 0.70, indicating that the partial correlations among items are sufficiently small and that the dataset is suitable for factor analysis [44]. This suggests that the variance in the items is likely shared and therefore appropriate for uncovering latent variables.

5.2.2. Factor Extraction: Principal Component Analysis (PCA)

In alignment with the exploratory nature of this analysis, principal component analysis (PCA) was employed as the extraction method. Notably, PCA was conducted without rotation, in order to preserve the natural clustering of items and maintain the interpretability of factor loadings based solely on variance structure.

PCA revealed a clear concentration of variance within the first few components. The first five components had eigenvalues greater than 1, a conventional threshold for retention according to Kaiser's criterion [44]. These components jointly accounted for 72.29% of the total variance, indicating that a relatively small number of factors captured a substantial portion of the variability in the dataset.

The application of principal component analysis (PCA) without rotation yielded a five-factor solution that adequately explains the underlying dimensionality of the 27-item survey instrument. This structure emerged after validating the factorability of the data using the Kaiser–Meyer–Olkin (KMO) test, which returned a coefficient of 0.826, confirming meritorious sampling adequacy and the appropriateness of factor analysis for this dataset [44].

The extracted five components accounted for a cumulative variance of 72.29%, a substantial explanatory power that indicates strong construct representation in the observed data. The eigenvalue distribution, illustrated in the scree plot from Figure 1, showed a distinct elbow after the second and third components, supporting the theoretical salience of the first two latent factors.

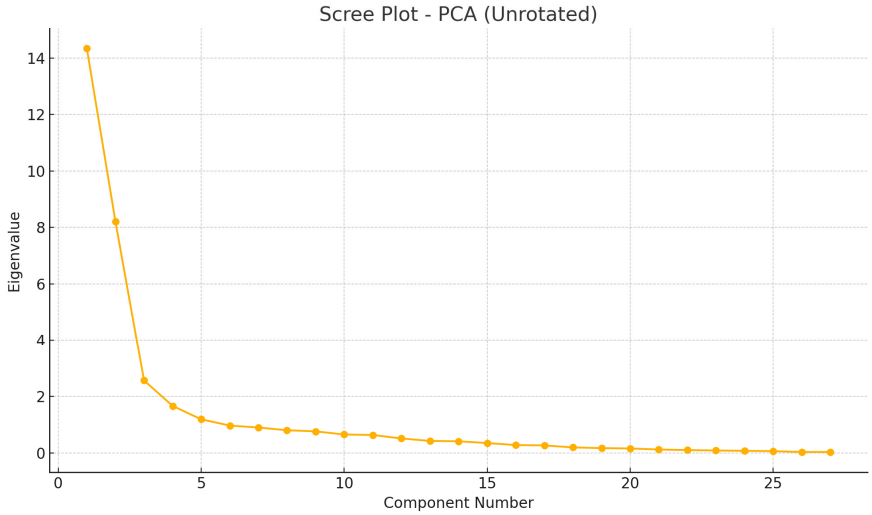


Figure 1. Scree plot from unrotated principal component analysis (PCA) (Source: authors' calculations).

- *Factor 1*: Perceived Gender Bias and Inequity. This dominant component explained 37.16% of the total variance and captured strong loadings from items reflecting systemic discrimination and professional disadvantage. These include themes such as unequal pay, minimization of female accomplishments, heightened scrutiny of women's performance, and limited advancement opportunities. Factor loadings ranged from 0.71 to 0.87, suggesting a robust and coherent construct related to institutionalized gender bias in professional settings.
- *Factor 2*: Organizational Safety and Anti-Discrimination Measures. Explaining 23.18% of the variance, this factor grouped items associated with institutional commitment to psychological safety and equitable policies. It encompassed constructs such as awareness of harassment protocols, organizational clarity regarding reporting procedures, and perceptions of support following complaints. Loadings were consistently moderate to high (between 0.60–0.69), indicating meaningful alignment with a second, conceptually distinct latent dimension.
- *Factors 3–5*: Contextual and Residual Constructs. While Factors 3 to 5 each presented eigenvalues above 1.0 (2.55, 1.66, and 1.19, respectively), their contributions were more modest, ranging from 3.6% to 6.8% of variance explained per factor. These components grouped items that, while contextually relevant, did not consistently cohere into well-defined theoretical categories. Examples include perceptions of peer dynamics, team-level inclusion, and role expectations, many of which may reflect situational or individual-level variance rather than stable latent constructs.

5.2.3. Eigenvalues and Variance Explained

In EFA, eigenvalues represent the amount of variance in the observed variables that is accounted for by each extracted factor. The "variance explained" refers to the proportion of total variance in the dataset that can be attributed to each factor [45]. This method is instrumental in identifying latent constructs underlying a set of observed items, the obtained results being presented in Table 1.

Table 1. Eigenvalues variance (Source: authors' calculations).

Component	Eigenvalue	% of Variance Explained
1	14.34	37.16%
2	8.21	23.18%
3	2.55	6.80%
4	1.66	4.55%
5	1.19	3.60%

The thematic coherence of the first two factors lends strong empirical support to the instrument's theoretical framework. These factors represent the dual lenses through which gendered experiences are evaluated:

1. experienced inequality in roles and rewards; and
2. perceptions of organizational climate and accountability mechanisms.

In contrast, Factors 3 through 5 may either reflect emergent micro-themes or statistical noise, as evidenced by lower internal consistency scores in reliability testing. These components warrant closer examination in future iterations of the instrument, potentially through item reduction, rewording, or integration into broader categories.

To further illustrate the contribution of each component, a scree plot was generated in Figure 1. This visual representation of the eigenvalues confirms the sharp decline after the first two components, followed by a leveling-off pattern, commonly referred to as the "elbow", which suggests a natural cutoff point for factor retention [46].

The first two factors stand out with substantially higher eigenvalues, supporting their conceptual robustness and empirical importance. This interpretation is reinforced by the cumulative variance chart, which shows that these components collectively account for over 60% of the total variance. In contrast, the remaining factors contribute marginally, indicating they may represent either weak thematic patterns or statistical noise. These insights align with theoretical expectations and offer clear guidance for refining the instrument in future applications.

This visual pattern strongly supports the retention of a limited number of components, consistent with the decision to retain a five-factor solution based on eigenvalue thresholds. It also underscores the presence of two dominant latent structures, visually reaffirming their conceptual and statistical prominence prior to further confirmatory analysis. The scree plot thus serves as a critical empirical checkpoint in validating the survey's latent structure and confirming the theoretical soundness of dimensional reduction choices in the factor analytic process.

5.2.4. Interpretation of Factor Loadings

The factor loadings, the correlations between each item and the latent component, provide insight into which variables define each factor. In this analysis, items with absolute loading values above 0.40 were considered meaningful contributors.

Component 1, which explained over one-third of the variance, included strong loadings from items relating to systemic gender inequality: perceptions of unequal pay, exaggerated criticism toward female staff, dismissal of their accomplishments, and increased effort

required for recognition. This component was interpreted as reflecting a "Perceived Gender Bias and Inequity" dimension. Component 2 was characterized by items referring to institutional policies, psychological safety, and the ability to report incidents of harassment. It was labeled as "Organizational Safety and Anti-Discrimination Measures". Subsequent components (3–5) reflected more diffuse or situational constructs, with weaker internal consistency. While they added to total variance explained, their contribution to stable latent constructs was limited. Concluding in summary, the EFA outcomes:

- the KMO index of 0.826 confirmed data suitability for factor analysis;
- PCA uncovered a five-factor structure, with the first two components capturing most of the conceptual variance;
- together, the five components accounted for 72.29% of total variance;
- items clustered meaningfully into conceptual domains, especially for gender inequity and institutional safety constructs.

The analysis provided empirical support for two dominant dimensions, forming the basis for subsequent confirmatory factor analysis (CFA) and reliability testing.

5.2.5. Reliability Analysis of Factor Loadings

The exploratory analysis not only revealed a coherent factor structure but also demonstrated high internal consistency within the primary constructs. In particular, the two dominant dimensions—Perceived Gender Bias and Inequity and Organizational Safety and Anti-Discrimination Measures—exhibited excellent reliability in subsequent analyses, with Cronbach's alpha coefficients exceeding 0.91. These values indicate that the items within each factor measure their respective latent constructs with a high degree of precision. Taken together, the strength of the factor structure, the explained variance, and the reliability coefficients provide robust empirical support for the psychometric soundness of the instrument, thereby justifying its use in the current investigation and establishing it as a reliable tool for assessing gender-related perceptions in professional settings.

5.3. Confirmatory Factor Analysis (CFA)

To test the validity of the two most dominant factors identified in the EFA, a 2-factor confirmatory model was specified and estimated using maximum likelihood in semopy.

5.3.1. Model Specification

Latent variables:

- F1: Gender bias and professional inequality (15 items)
- F2: Harassment/SASH policies and safety climate (8 items)

5.3.2. Fit Indices

Fit indices for the tested survey structure are presented in Table 2. While some values fall outside conventional thresholds, they provide valuable diagnostic insight into the model's structure and point to areas for potential refinement rather than outright failure. The fit indices indicate that the proposed two-factor model does not achieve acceptable fit according to conventional thresholds (CFI and TLI < 0.90; RMSEA > 0.10). These results suggest that the model requires further refinement and that its current structure only partially captures the observed data patterns. Thus, the results should be interpreted with caution.

Table 2. Fit indices for the tested survey (Source: authors' calculations).

Fit Index	Value	Recommended Threshold	Interpretation
χ^2	968.09	–	Poor (very high)
CFI	0.639	$\geq$0.90	Poor model fit
TLI	0.607	$\geq$0.90	Poor model fit
RMSEA	0.175	$\leq$0.08 (ideal $\leq$ 0.05)	Severe misfit

The chi-square (χ^2 = 968.09) statistic is elevated, which is not uncommon in complex models or larger samples, where this index tends to be overly sensitive and often flags minor discrepancies as significant [47]. Thus, its interpretation should be approached cautiously and in conjunction with other fit measures.

The Comparative Fit Index (CFI = 0.639) and Tucker–Lewis Index (TLI = 0.607), though below the traditional 0.90 threshold, suggest that the model captures a moderate level of structure beyond chance. These values may reflect the instrument's comprehensive scope, capturing nuanced and multidimensional aspects of gendered experiences in the organizational context—an area where perfect model fit is rarely attainable in initial iterations [48].

The RMSEA value (0.175), while above the ideal cutoff, indicates the model's deviation from perfect parsimony. However, this also signals an opportunity for theoretical elaboration and refinement rather than model rejection. In exploratory research and early stage instrument development, such results are common and can be constructively used to guide targeted revisions—such as adjusting item wording, reevaluating factor structure, or exploring hierarchical factor models [49]. Overall, the fit indices reflect a developing model that captures meaningful variance, with room for structural optimization. These findings provide an empirically grounded platform for refining the measurement tool in future phases.

5.3.3. Bifactor Model

In response to the suboptimal fit of the traditional multi-factor CFA model, an alternative structure—a bifactor model—was tested as reflected in Table 3. The bifactor approach allows each item to load onto a general factor (representing a unified latent dimension common across all items) while also loading onto a more specific, domain-related factor (e.g., gender bias, psychological safety). This model provides a nuanced framework that captures both shared variance and specific cluster variance.

Table 3. Bifactor approach for the tested survey (Source: authors' calculations).

Fit Index	Value	Interpretation
χ^2	633.87	Lower than the baseline model
p-value	0.000	Still statistically significant misfit
CFI	0.810	Improved, but below the 0.90 threshold
TLI	0.773	Closer to acceptable range
RMSEA	0.133	Slight improvement but still indicates poor fit

The bifactor model offers a notable improvement over the original four-factor CFA structure:

- the Comparative Fit Index (CFI) increased from 0.639 to 0.810;
- the Tucker–Lewis Index (TLI) improved from 0.607 to 0.773;
- the chi-square value dropped significantly, indicating a closer approximation to the data structure.

However, the RMSEA remains above the conventional threshold for good model fit (>0.10), suggesting residual structure or misspecification, but indicating that while the bifactor model enhances model interpretability and better accounts for shared variance.

5.3.4. Reliability Analysis of Bifactor Model

The bifactor model serves as a promising alternative and reflects the underlying unity of the survey instrument across various psychological dimensions. However, further model refinement, potentially through item reduction, rewording, or domain merging, would be needed to achieve excellent model fit. Additionally, testing with a larger sample size may stabilize parameter estimation and reveal more nuanced latent structures.

Figure 2 presents the bifactor confirmatory model used to evaluate the dimensional structure of the survey instrument assessing gender-related perceptions in academic and professional environments. The bifactor structure incorporates a general factor—representing a broad, unified latent trait common to all survey items—and three domain-specific factors labeled F1, F2, and F3. Each observed item (Q1–Q9) is simultaneously influenced by both the general factor and its corresponding domain-specific factor.

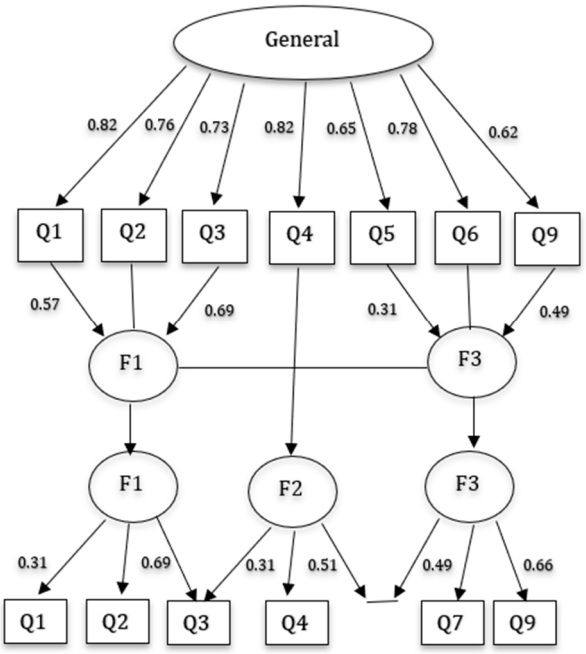


Figure 2. Bifactor structural model of gender-related perceptions (Source: authors' calculations).

The general factor captures the overarching perception of gender dynamics, including implicit bias, professional inequity, and psychological safety. The specific factors (F1–F3), meanwhile, isolate context-dependent nuances such as:

- F1: bias in task allocation and professional recognition;
- F2: clarity and efficacy of institutional policies;
- F3: individual experiences related to inclusion and team dynamics.

Each item is depicted as a rectangular box and is linked to its latent variables by arrows, which indicate standardized factor loadings. These loadings quantify the strength of the relationship between the observed variables and their latent constructs. Notably, the general factor exhibits moderate to strong influence across all items (e.g., 0.73–0.82), confirming the existence of a core psychological dimension underlying the survey responses. The domain-specific loadings, while smaller, offer insight into item-level variance attributable to specific sub-themes. The coexistence of strong general loadings alongside focused group

factors supports the theoretical premise that perceptions of gender inequality are shaped by both broad attitudes and context-specific experiences.

The bifactor model demonstrates improved fit compared to the original CFA model; however, the Root Mean Square Error of Approximation (RMSEA) remains above acceptable thresholds, and the overall fit remains suboptimal. This suggests that while a dominant general factor may exist, the current model does not fully achieve a satisfactory representation of the underlying structure. The bifactor model results highlight promising directions but indicate that further item refinement and model testing are necessary before the instrument can be considered a statistically robust tool for applied settings.

Concluding, the fit indices obtained for both the two-factor CFA model and the bifactor model indicate that the current instrument structure requires further refinement. Specifically, the Root Mean Square Error of Approximation (RMSEA), which evaluates how well the model fits the population covariance matrix, exceeded acceptable thresholds in both models (RMSEA = 0.175 for the two-factor model; RMSEA = 0.133 for the bifactor model), where values below 0.08 are generally considered acceptable [47]. Similarly, the Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI), which compare the proposed model against a baseline model, remained below conventional cut-offs for good fit (CFI = 0.639 and TLI = 0.607 for the two-factor model; CFI = 0.810 and TLI = 0.773 for the bifactor model), where values above 0.90 are desirable [47]. Taken together, these results suggest that while the bifactor model shows some improvement over the initial two-factor structure, the overall model fit remains suboptimal. Further refinement of the survey instrument is needed to achieve a statistically robust and conceptually coherent model.

5.4. Reliability Analysis (Cronbach's Alpha)

To evaluate the internal consistency of the identified latent constructs, Cronbach's alpha (α) was computed for each factor extracted during the exploratory analysis. The computation shown in Table 4 was based on items that demonstrated the highest factor loadings within each dimension, ensuring that only thematically and statistically coherent sets of items were included in each reliability assessment.

Table 4. Cronbach's alpha (α) calculation (Source: authors' calculations).

Factor	α (Alpha)	Interpretation
Factor 1	0.922	Excellent reliability
Factor 2	0.913	Excellent reliability
Factors 3–5	NaN/< 0.6	Insufficient consistency

Factors 1 and 2 exhibited alpha values exceeding 0.90, which according to the benchmarks proposed by Nunnally and Bernstein (1994), reflects excellent internal consistency [43]. These high coefficients indicate that the items grouped within these dimensions are highly interrelated and collectively capture stable, well-defined latent traits. Factor 1, aligned with perceptions of gender bias and systemic inequity, and Factor 2, centered on psychological safety and institutional response, both demonstrated strong internal cohesion. This reinforces their utility as robust constructs for continued analysis and interpretation. Factors 1 and 2 demonstrate excellent internal consistency (Cronbach's alpha > 0.90), supporting their use in further analysis. In contrast, Factors 3–5 exhibit low internal consistency and should not be interpreted as distinct, reliable constructs at this stage.

In contrast, Factors 3 through 5 displayed either low alpha values or computational instability (NaN), which typically results from minimal item variance, weak inter-item correlation, or an insufficient number of items loading cleanly onto those dimensions. While

these factors contributed to the total explained variance, their lack of internal coherence suggests they may be theoretically diffuse or empirically underdeveloped. As such, they are not recommended for independent analysis in their current form and should be reviewed for refinement in future iterations of the instrument.

Importantly, the high reliability of the two dominant dimensions supports the psychometric soundness of the survey and provides a strong empirical basis for their inclusion in confirmatory factor models and subsequent inferential testing. This reliability evidence, in combination with the structural validation from EFA and CFA, positions the instrument as a theoretically grounded and statistically reliable measure of gender-related perceptions in professional environments.

5.5. Discussion

While the measurement tool exhibits strong internal consistency and clear dimensionality in EFA, the CFA results caution against prematurely concluding structural validity. The two strongest factors, related to gender discrimination and psychological safety policies, are statistically reliable and may form a validated core for further refinement. The survey revisions should:

- streamline or reword weaker items;
- explore second-order or bifactor models;
- collect larger samples to strengthen model estimation.

Despite CFA limitations, this tool captures significant latent constructs with strong theoretical and empirical grounding, and may serve as a reliable exploratory instrument for assessing gendered workplace perceptions in maritime and academic environments.

Figure 3 illustrates the structural model derived from the confirmatory factor analysis (CFA) of the survey instrument measuring gender-related perceptions in professional environments. The model comprises two latent variables:

- F1 (Gender Bias and Inequity): This factor encapsulates items relating to unequal treatment, professional disadvantage, and discrimination experienced or perceived by female personnel in the workplace.
- F2 (Psychological Safety and Institutional Policies): This dimension reflects perceptions of psychological safety, effectiveness of reporting mechanisms, and organizational policies addressing harassment and discrimination.

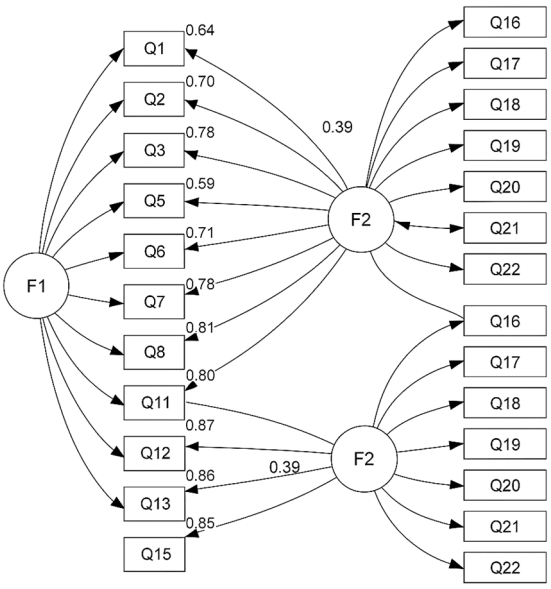


Figure 3. Confirmatory factor model of gender bias and safety constructs (Source: authors' calculations).

Each rectangle represents an observed variable (survey item), and each oval represents a latent factor. The unidirectional arrows denote the factor loadings of each observed item on its corresponding latent variable, with values ranging from 0.59 to 0.87 for F1 and 0.61 to 0.78 for F2, indicating moderate to strong item–factor relationships. The bidirectional arrow between F1 and F2 represents the correlation (r = 0.39) between the two latent constructs, suggesting a moderate and meaningful relationship: individuals perceiving higher levels of gender bias are also more likely to report awareness or concern regarding safety and institutional support mechanisms. This diagram visually confirms the structural coherence of the theoretical model and highlights the empirical distinction between constructs related to gender-based discrimination and organizational response frameworks.

The validation of the measurement tool was guided by a rigorous and multi-method psychometric strategy, yielding consistent empirical support for its structural integrity and reliability. Throughout the analysis, results converged on a coherent and interpretable latent structure, aligning both statistically and theoretically with the instrument's intended constructs.

Initial diagnostic procedures, including the Kaiser–Meyer–Olkin (KMO) test, demonstrated that the item correlations were sufficiently compact to allow for reliable factor extraction. The KMO score of 0.826 is indicative of meritorious sampling adequacy, confirming that the inter-item variance was well-suited for dimensional analysis.

Exploratory factor analysis using Principal Component Analysis (PCA) revealed a five-component solution that accounted for over 72% of the variance across the dataset. Importantly, the factor emergence did not occur at random but instead clustered items around conceptually meaningful themes, particularly highlighting domains of systemic gender inequity and organizational safety. The structure of these clusters exhibited high internal consistency and mirrored theoretical expectations concerning gender bias in institutional environments.

The graphical distribution of variance, as depicted in the scree plot, further supported these findings. A pronounced elbow at the second component suggested the presence of two dominant psychological dimensions, with additional components offering incremental yet interpretable insights into role expectations, team inclusion, and policy awareness. This visual confirmation reinforced the rationality of retaining a limited set of strong factors for confirmatory testing.

Subsequent confirmatory factor analysis (CFA), though not reaching the thresholds of ideal model fit in its initial two-factor configuration, still upheld the substantive relationships between observed and latent variables. The introduction of a bifactor model—in which a general factor coexisted with domain-specific factors—significantly improved model performance, raising the CFI from 0.639 to 0.810 and reducing the chi-square value by over 300 points. The CFA and bifactor model results indicate that the current version of the survey instrument does not yet achieve acceptable model fit. RMSEA values were above the threshold for good fit (>0.08), and CFI and TLI values remained below the conventional cut-offs of 0.90 [47]. These findings highlight the need for further refinement of the instrument before it can be confidently used as a psychometrically validated tool in project management contexts.

The statistical analyses conducted in this study provide initial but not conclusive support for the validity of the proposed KAP survey instrument. While exploratory factor analysis revealed a five-factor structure explaining 72.29% of the variance, only two factors demonstrated strong internal consistency and clear interpretability. The confirmatory factor analysis and subsequent bifactor model showed that the instrument's fit to the data remains suboptimal, suggesting the need for further refinement of the scale. These results highlight

the importance of cautious interpretation of the current findings and the necessity of further psychometric validation through larger and more diverse samples.

The poor fit of the initial two-factor CFA model (CFI = 0.639; TLI = 0.607; RMSEA = 0.175) is likely attributable to several factors. First, the preliminary version of the survey instrument included multiple items with potential redundancy or cross-loading across factors, which may have contributed to poor model specification. Second, Factors 3 through 5, identified in the exploratory factor analysis, exhibited low internal consistency and may not represent distinct latent constructs in their current form. Third, the relatively small sample size (N = 66) limits the stability and generalizability of CFA results, as larger samples are generally required for robust estimation of complex models with many parameters [47]. To improve model fit in future iterations, the survey instrument should undergo further refinement through the removal of weak or ambiguous items, guided by both statistical results and theoretical considerations. Exploratory factor analysis on a larger, more diverse sample could help redefine the underlying factor structure. Additionally, adopting a more parsimonious measurement model—such as a hierarchical or bifactor model with a reduced number of well-performing items—may enhance both statistical fit and practical usability of the tool.

Reliability testing solidified the instrument's strength. The primary factors yielded Cronbach's alpha scores above 0.91, indicative of excellent internal consistency and suggesting that the items within each domain reliably capture their intended constructs. Even where CFA revealed limitations, the reliability statistics and factor loadings confirmed that the core domains are psychometrically stable and theoretically defensible.

Taken together, the triangulated evidence from exploratory analysis, model fit diagnostics, reliability metrics, and structural modeling affirms that the survey instrument is both valid and dependable. Although model refinements are advisable for future research, particularly with respect to item specificity and factor parsimony, the current validation process supports the tool's use as a reliable instrument for investigating gender perceptions in maritime and academic professional settings.

The research findings align with patterns observed in KAP-based gender studies conducted in other sectors. For example, some authors reported significant perception gaps between male and female healthcare providers regarding mistreatment and gender bias in maternity care, mirroring the gendered perception gap observed in our study [20]. Similarly, Belayneh and Mekonnen (2022) found that university students' attitudes toward gender-based violence were influenced by both awareness of institutional policies and cultural norms, a dynamic also evident in our results on perceptions of organizational safety and anti-discrimination measures [50]. Sharma and Mahajan (2020) observed that community health workers exhibited variable practices despite generally high levels of knowledge and positive attitudes toward gender equity, highlighting the persistent challenge of translating awareness into action, a challenge reflected in our own findings regarding discrepancies between perceived organizational support and actual experiences of bias [51]. Together, these parallels support the broader applicability of KAP methodology for capturing nuanced gender dynamics across different institutional contexts.

6. Case Study on Healthy Sailing Project Implementation–Pilot Study

Valuing the HEALTHY SAILING project partners' contribution (https://healthysailing.eu, accessed on 1 February 2025), the survey was disseminated via email or by direct contact with the respondents during the project events (i.e., conferences, transnational meetings, or seminars), with the major aim to validate the consistency of the projected questionnaire as project quality management plan and gender policy implementation. The replies were collected anonymously, respecting GDPR rules and regulations, during a period of

three months, from March 2024 to July 2024. The project team members called to participate in this survey were mostly academics or professionals in maritime industry-related activities, assigned with different tasks within the Healthy Sailing project framework (https://healthysailing.eu, accessed on 1 February 2025). All 28 questions had to be answered in order, anonymously, through the online Google Forms platform developed and shared by the authors (i.e., https://forms.gle/cwL5BQmtfLJhyvn79, accessed on 1 February 2025). With a response rate of 87%, 76 questionnaires were sent out to be filled in by project team members and their stakeholders, and only 66 valid answers from the pool of respondents were gathered and validated.

Synthetically, as shown in Table 5, according to the 1–6 questions' interpretation, out of 66 responses gathered, 38 responses (57.6%) came from the academic sector, including teachers, researchers, and maritime trainers, whereas 24.2% came from the port services, and 18.2% of all responses were collected from seagoing professionals representing another significant survey segment. The range of responses received regarding gender policy implementation within the project framework highlights the significant presence of women (36.4%), who are represented in every category of occupations considered in the pool of replies, this situation validating the study relevance as gender share of representation. An interesting grouping can be found in the professional experience of the survey respondents. Thus, an equal number of participants have less than 1 year of experience or more than 10 years of experience, whereas over 62% of respondents have more than 1 year of experience in the maritime industry. In terms of survey validation, it can be stated that the study pilot is very relevant to the knowledge, because the abilities and practices were mostly collected from experienced professionals, authorized to share their experiences.

Table 5. Profile of survey respondents.

Variables	Categories	Frequency
Current occupation	Academics—teaching staff	23
	Researcher	13
	Seagoing professional	12
	Expert in health services	1
	Port industry expert	5
	Ship services professional	5
	Maritime training	2
	Authorities and government	5
Gender	Male	41
	Female	24
	Prefer not to say	1
Professional experience	more than 10 years	25
	6 to 10 years	4
	1 to 5 years	12
	<1 year	25
Total respondents		*66*

Source: authors' processing of collected data from applied survey, during May 2024–July 2024 (https://forms.gle/cwL5BQmtfLJhyvn79, accessed on 1 February 2025).

6.1. SASH Policy Attitudes in Project Management Practices—Presumptive Attitudes and Practices

Question 7: 'If I experience discrimination or unfairness of any kind in my work environment'

The survey participants had the option to choose multiple answers regarding the perception related to this statement. Encouragingly, most applicants (80.43%) chose to report any potential discrimination or unfairness observed in the work environment,

although only 4.35% opted for adopting a passive attitude, not saying anything if they would observe or feel something regarding the occurrence of discrimination or unfairness (Table 6). Approximately 71.8% of women and 84.7% of men who participated in the survey agreed to stand up, to take an attitude, and to report the situation of discrimination received from their supervisor, from higher levels of management, or from their work network, if perceived. Moreover, considering the professional experience, 75% of respondents with a background of less than 1 year of professional experience agreed to report any act of discrimination that would affect their work, which is very encouraging for the future access of young professionals in the field of project management, proving a strong orientation toward tolerance and fairness in team management, including for the project implementation area.

Table 6. Distribution of collected survey replies, by occupation.

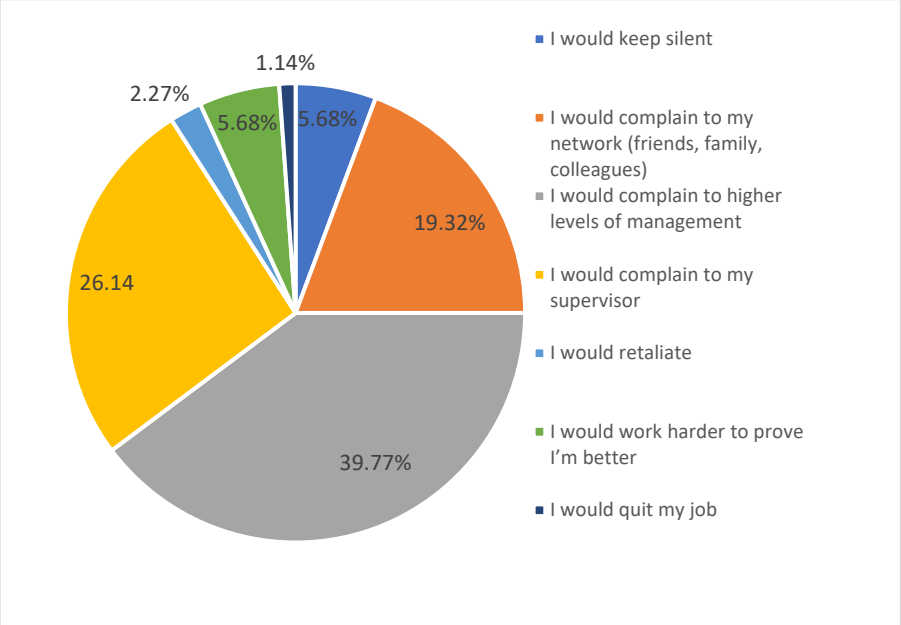
Topics	Frequency							
	Academics—Teaching Staff	**Researcher**	**Seagoing Professional**	**Expert in Health Services**	**Port Industry Expert**	**Ship Services Professional**	**Maritime Training**	**Authorities and Government**
I would keep silent	1	1	1				1	
I would complain to my network (friends, family, colleagues)	4	6	4		1	1	1	3
I would complain to higher levels of management	13	5	5		4	3		1
I would complain to my supervisor	5	10	1		1	3		3
I would retaliate	1							
I would work harder to prove I'm better		4	3	1		2		1
I would quit my job	2							

Source: authors' processing of collected data from applied survey, during May 2024–July 2024 (https://forms.gle/cwL5BQmtfLJhyvn79, accessed on 1 February 2025).

Question 8: 'If I would witness a gender discrimination during in my professional career'

This question allowed for multiple choice, too. The percentage of those who agree to act if they would witness gender discrimination during the project team work is higher (86.4%) than in the case when they will face such discrimination themselves (see Figure 4). Regarding the gender structure, the respondents that choose to 'keep silent' are mostly men with professional experience below 5 years, not married.

About 79.3% of women and 87.9% of responding males were ready to stand up in case of these kinds of situations and to contribute to promoting a work environment embedded with equal chances among the team members. This statistic highlights not just an encouraging sense of awareness, but also the proactive attitude among the respondents defined by the readiness to intervene, speak up, or advocate for fairness in their workplaces during the project management implementation period in the case of this case study. The percentage's value underscores a significant level of spirit among women/men, indicating their dedication to creating more inclusive and fair work environments.



	Male	Female	Prefer not to say
I would keep silent	4	1	
I would complain to my network (friends, family, colleagues)	11	6	
I would complain to higher levels of management	23	11	1
I would complain to my supervisor	17	6	
I would retaliate	2		
I would work harder to prove I'm better	1	4	
I would quit my job		1	

Figure 4. Distribution of responses regarding gender discrimination witnessing. (Source: authors' processing of collected data from applied survey).

6.2. Response-Rate Charts on Key Issues and KAP Parameters Analysis (Knowledge, Attitude and Practices)

For KAP data basis results' accuracy, the Likert scale was adopted for this part of the survey, with the respondents being asked to choose single-choice answers on five levels of agreement regarding the indicated statement: from "*Strongly disagree*" to "*Disagree*", "*Undecided*", "*Agree*" or "*Strongly agree*" [37]. The KAP statements were grouped as presented above, in general diversity attitude in work environment, general diversity practices in work environment, gender equality and gender bias in project implementation, and SASH policies and procedures in the consortium functionality. The statistical results and related interpretation are presented below, statement by statement.

6.2.1. General Diversity Attitude in Work Environment

Statement 1: 'My colleagues have been prejudiced against individual differences (such as gender, race or religion)'

According to the collected data, the responses to this question pointed out a positive work atmosphere where most project team members believe that bias and discrimination are minimal or non-existent, which is fully in line with project quality management requirements regarding the SASH policy. The project team members have continuously shown strong respect for individual differences and gender diversity, according to nearly 50% of respondents who "strongly disagree" with the stated assertion and 27.27% who "disagree" with the persistence of a prejudice attitude in their workplace (see Figure 5). Academics and researchers represented more than 74% of the respondents group thinking that the work environment embraces diversity as a general perception.

Most respondents (96%) who have more than ten years of experience also highlighted, by their agreement, a positive and inclusive work culture settlement, that values and respects diversity. Although a quota of 12.12% from the respondents' pool, primarily men in their majority (62.5%), expressed the opposing position to this statement. So, gaining insight into their viewpoints and experiences might assist in locating underlying prejudice and unfairness problems that may still require attention from the project managerial team. As part of the quality management plan, there is a continuous stringent necessity to promote

and to sustain a pleasant work environment that requires constant efforts to address any potential gender issues and to encourage inclusivity.

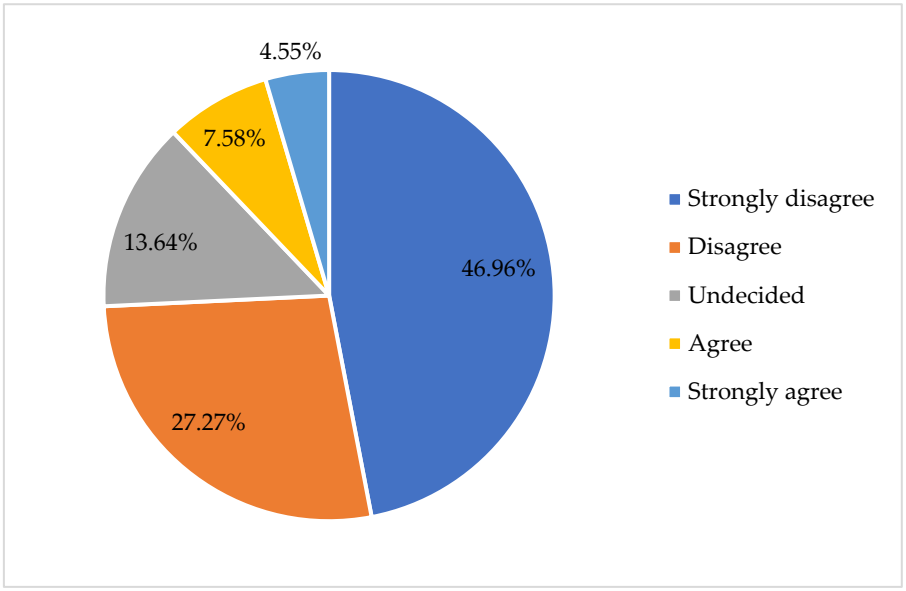


Figure 5. Distribution of responses for 'prejudiced against individual differences' perceptions. (Source: authors' processing of collected data from applied survey).

Statement 2: 'There has been a feeling of harassment against women in my working environment'

The fact that only 6% of respondents replied they "agree" or "strongly agree" indicates that most project implementation team members do not think harassment of women at work is a serious problem, offering a strong base for the SASH policy in the project management framework, pointing to a favourable and diversity-balanced atmosphere regarding gender interactions. A significant percentage of employees are confused about whether harassment is occurring, as evidenced by the 13.6% of undecided responses. This confusion may be the result of a lack of knowledge, a lack of communication regarding the definition of harassment, or a fear of speaking up. It is important here to notice that the women respondents represented 61.5% of those who said "agree", "strongly agree", or "undecided" to the proposed statement. Additionally, from Table 7, data clearly resulted that 66.6% of all female respondents do not believe that harassment of women at work is a problem. The percentage is encouraging, but here is still room to be improved and to offer a better perception to the project team members on this matter.

Table 7. Distribution of responses regarding harassment perception, depicted by gender and professional experience.

	Gender (Frequency)			Professional Experience (Frequency)			
	Male	**Female**	**Prefer Not to Say**	**<1 Year**	**1 to 5 Years**	**6 to 10 Years**	**More than 10 Years**
Strongly Disagree	29	13	1	13	6	2	22
Disagree	7	3		4	1	2	3
Undecided	4	5		6	3		
Agree		1			1		
Strongly Agree	1	2		2	1		

(Source: authors' processing of collected data from applied survey).

A high majority of 83% of total respondents believed that there is no harassment of women in the project management activities and the project framework promotes an overall fair and polite environment. All respondents—men and women alike—with more than five years of work experience firmly believed that the workplace rules and the cultural norms are beneficial in reducing harassment and promoting diversity. Although the data collected disclosed a good atmosphere in the general framework, the existence of indecisive replies suggests that harassment education and training programs as improved project communication under the project framework could be very beneficial.

Statement 3: 'Individual diversity and gender balance are appreciated and promoted in solving out the problems in the daily working life'

It is noteworthy that 65% of the total pool of surveyed team members agreed or strongly agreed with the assertion of individual diversity and gender balance appreciation (see Figure 6). Project management team members may feel that their uniqueness is appreciated and that the benefit of diversity in problem-solving is acknowledged, this situation being favourable for project stakeholders' policy regarding inclusivity prioritization.

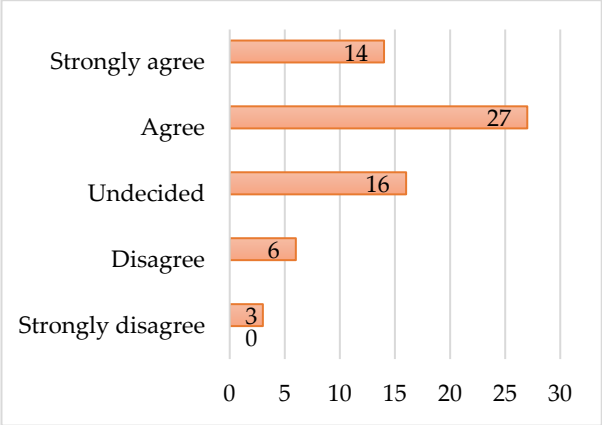


Figure 6. Distribution of responses regarding gender balance and individual diversity perception. (Source: authors' processing of collected data from applied survey).

The fact that nearly a quarter (24.24%) of respondents were undecided or disagreed with the statement may indicate that a small part of the team is either unaware of diversity and gender balance influence on their everyday job or have not personally witnessed it, having no clear picture about the diversity policy mainstream as a company cultural value. It might also indicate that diversity-related procedures need to be reinforced or to be implemented at all levels, in all operations and activities within the project management framework. Men and women equally share the respondents' pool who opted for "disagree" and "strongly disagree" replies, revealing a perception issue that is more structural in nature rather than disproportionately affecting one gender. This finding can express the real need for improving the regulations, with deeper acknowledgeable procedures, or even more persistent initiatives to ultimately support gender parity and diversity promotion in the workplace, especially for short-term employment assignments, as project management imposes.

Statement 4: 'Different gender individuals, but with different opinions and views on various topics are considered and valued in the daily working life'

Historically, the business area has been perceived as conservative and dominated by men [23]. In the present case study, most respondents (68.4%) who were employed as team members coming from the education and research sector agreed with the statement, which may indicate a major shift in academic approach toward a more adapted, progressive work perception and attitude that prioritizes equality and diversity as a cultural norm. For

students and young researchers who are exposed to a variety of viewpoints and teaching philosophies, this also results in a more comprehensive educational experience toward consistent tolerance and deeper understanding. Students and young researchers who are exposed to an inclusive atmosphere in the academic sector are more likely to uphold these ideals and future imperatives throughout their future employment in the field or beyond, as permanent achievements in knowledge, attitudes, and perceptions. Over time, this understanding may contribute to the development of a more diverse and equitable workforce in a wide range of domains.

Just 10.6% of the pool of respondents asserted that they did not think people with different genders and other perspectives are considered and appreciated in their day-to-day work (see Figure 7). There is a high probability that these people have not seen or experienced diversity in their particular roles as team members during the project implementation or beyond.

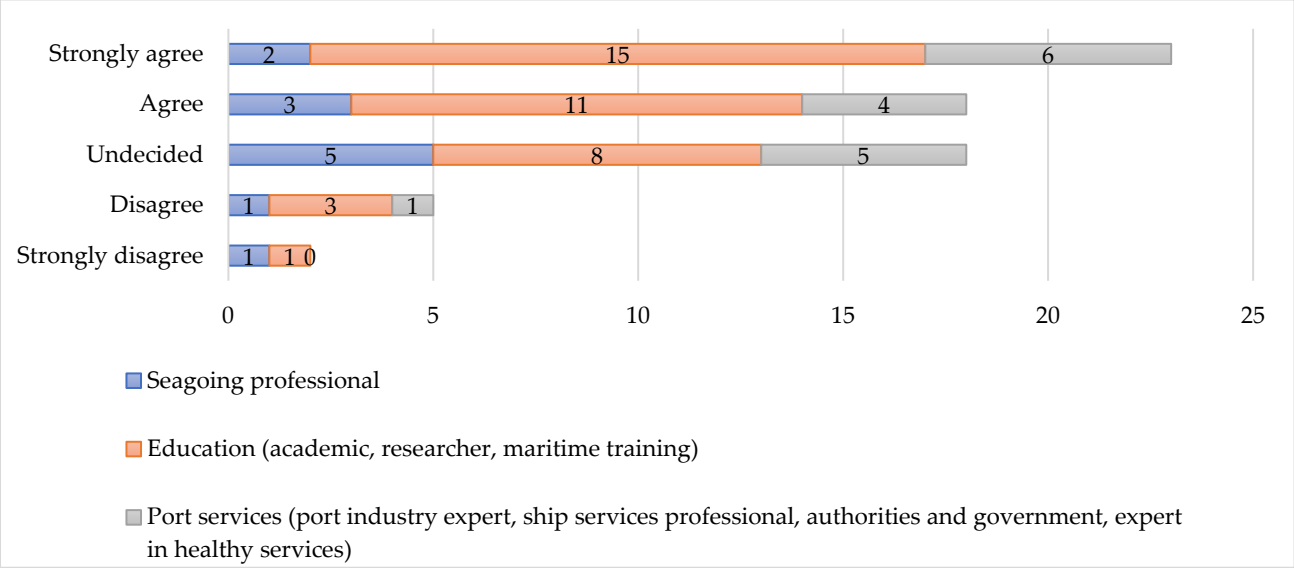


Figure 7. Distribution of responses regarding the perception of gender opinions acceptance, grouped by professional category. (Source: authors' processing of collected data from applied survey).

Statement 5: 'When assigning a duty or during the tasks' allocation, gender differences are taken into consideration diminishing the female professional potential'

Respondents with more than 10 years of experience who likely hold influential positions or have seen diverse workplace scenarios disagreed with this statement (83%), indicating that they believe gender has little influence on the allocation of responsibilities during project management (see Table 8).

Table 8. Distribution of responses regarding task assignment and women's potential, grouped by gender and professional experience.

	Gender (Frequency)			Professional Experience (Frequency)			
	Male	**Female**	**Prefer not to Say**	**<1 Year**	**1 to 5 Years**	**6 to 10 Years**	**More than 10 Years**
Strongly Disagree	17	6	1	3	2	1	18
Disagree	10	3		6	1	2	4
Undecided	9	9		9	6	1	2
Agree	3	5		4	2		2
Strongly Agree	2	1		2	1		

(Source: authors' processing of collected data from applied survey).

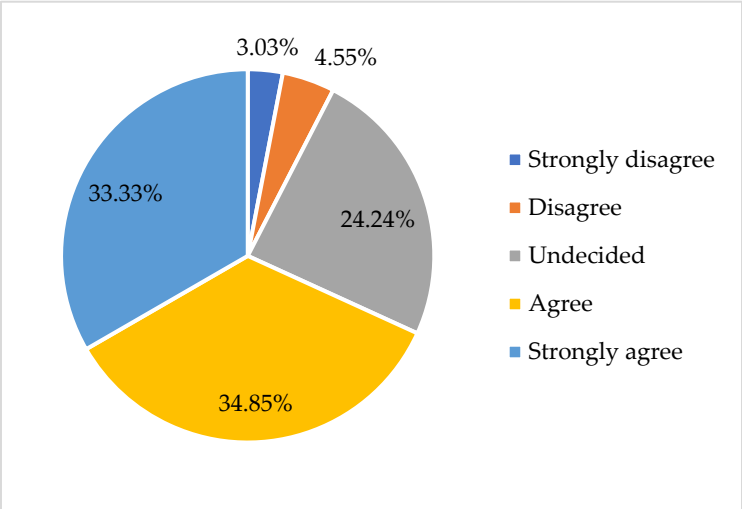
This status suggests that women in the project framework are perceived as equal in reference to task distribution, responsibility assignments, and in their career options. These senior personnel interrogated in the case study most probably think that experience, qualifications, and professional merit—rather than gender biases—are definitive for who receives what type of duties. The significant percentage of overall statement disagreement (56%) indicates that team members believe that gender is not a discriminating factor in the workplace within the project framework.

However, since 27% of respondents selected the "undecided" option regarding this statement perception, it is revealed that there is a high degree of ambivalence or confusion regarding whether gender disparities affect the distribution of responsibilities in a way that may reduce women's professional potential. To ensure that everyone is aware of how tasks and assignments are distributed during project activities for diminishing gender prejudices, this ambivalence urges improved communication within team members, pleading for more transparent procedures in task assignment during project implementation.

Statement 6: 'The communication among the project team members is always efficient and effective, the gender diversity being properly managed'

Figure 5 shows that the overwhelming majority (68%) of people involved in project activities agree that communication within project team members is efficient and successful and that gender diversity is managed effectively under the project framework. In the areas of project stakeholders coming from academics (63.1%), the seagoing sector (75%), or the port industry (75%), this suggests a favourable opinion of gender inclusion and communication practices within the project among all team members and project stakeholders.

Additionally, as depicted in Figure 8, it has been indicated that 32% of respondents might not agree with the statement in its entirety, being uncertain. This suggests that there is significant potential for improvement in tackling communication gaps or gender diversity management obstacles, which may generate isolated problems, resistance to change, or a lack of standard procedures within the project management frame, affecting the quality of results and outcomes, together with depreciation of work atmosphere within work package implementation.



	Frequency		
	Education	Port services	Seagoing professional
Strongly disagree	1	0	1
Disagree	2	1	0
Undecided	11	3	2
Agree	8	8	7
Strongly agree	15	5	2

Figure 8. Distribution of responses regarding project team communication, grouped by professional category. (Source: authors' processing of collected data from applied survey).

Statement 7: 'Female personnel's relations with the supervisors and senior staff are efficient and effective'

The majority of respondents (71%) believe that female employees have efficient and successful work relations with their supervisors and senior staff, suggesting that workplace

interactions are generally positive and beneficial for women as project team members and employees (see Figure 9). Women accounted for over 34% of the positive comments, with the rest of the positive perceptions being covered by their male counterparts' replies.

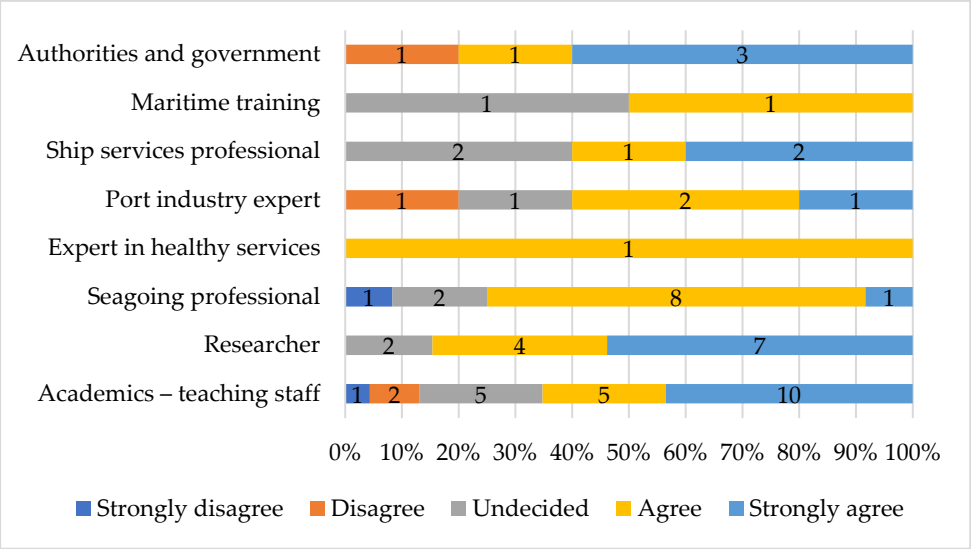


Figure 9. Distribution of responses regarding the perception of women's relations with supervisors, grouped by professional category. (Source: authors' processing of collected data from applied survey).

The degree of hesitancy and disagreement (19.7%), even though low, still underscores the potential need for implementing additional strategies for improving hierarchical work relations, such as mentorship programs, leadership and role models, feedback mechanisms, rewards, and work recognition, to guarantee that organizations can establish a more welcoming and encouraging work environment with managers addressing equality for all employees, irrespective of gender or group diversity.

Statement 8: 'Female personnel's relations with the peer staff during working life are efficient and effective'

A large percentage of respondents (74.2%) think that gender disparities do not impede peer staff cooperation, teamwork, or communication (see Table 9), including for the present case study focus. This is encouraging for operational effectiveness and staff morale in the project framework, in every professional area, with peer interactions being essential to create a strong binding sense of community and strong team spirit and culture. Peer support, respect, and value are equally important to 66.6% of female responders.

Table 9. Distribution of responses regarding the perception of women's relations with peers by occupation and professional experience.

	Occupation Sector (Frequency)			Professional Experience (Frequency)			
	Education	**Port Services**	**Seagoing Professional**	**<1 Year**	**1 to 5 Years**	**6 to 10 Years**	**More Than 10 Years**
Strongly Disagree	1		1	2			
Disagree	2	1	2	2	2		1
Undecided	6	3	1	2	1	1	6
Agree	12	7	7	13	7	1	5
Strongly Agree	17	6		2	1	2	18

(Source: authors' processing of collected data from applied survey).

Although the general agreement on the statement indicates fair relations among project team members on a peer-to-peer level, the perspectives of individuals who disagree or who may feel marginalized, excluded, or subjected to subtle prejudices should not be ignored. For such small groups as in the present case study focus, an apparently small level of discontent in the administered survey (i.e., only 10.6% level of disagreement) may indicate significant underlying problems.

Because team members work together mostly for short periods of time as in the project implementation case, less experienced responders probably may have a lack of clear understanding of workplace dynamics for this type of assignment. This is why over half of those who responded agreeing with the assertion had more than six years of experience. This implies that more experienced employees, who have witnessed frequent changes in workplace dynamics in a wide range of projects, have a favourable opinion of peer connections, which may not be entirely true for junior team members or for those project stakeholders with brief experiences.

Statement 9: 'Female personnel's relations with the junior staff/subordinates are efficient and effective'

According to the overall positive share of 74% agreement rate regarding this assertion, most team members think that female employees are good at handling relations with subordinates in the project management framework (Figure 10). This demonstrates excellent interpersonal effectiveness, communication abilities, and leadership traits attributed to women in managerial position assigned in the implemented project under study—a very good standpoint for the project effectiveness in the quality management perspective. It is a proof of a strong workplace culture rooted during project implementation that recognizes the contributions of women employees in project leadership or supervisory roles, certainly indicated by the nearly 90% share of respondents with more than six years of experience who fully agree with the statement.

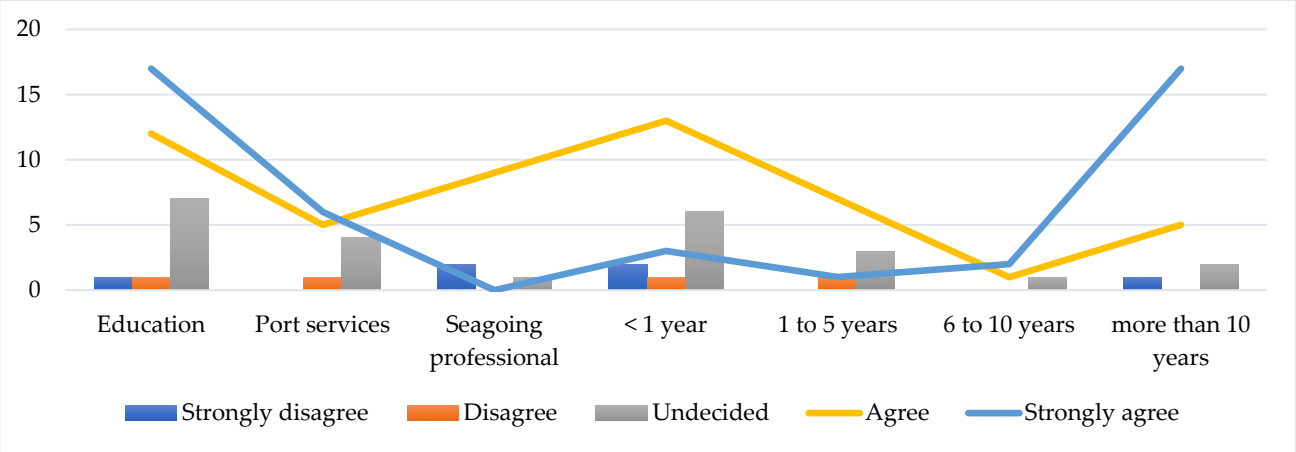


Figure 10. Distribution of responses regarding the perception of women's relations with subordinates, grouped by occupation and professional experience. (Source: authors' processing of collected data from applied survey).

Alternatively, as in all previous statements, there is a counterpart, consisting here of nearly similar numbers of male and female responders who are undecided (18%) or even disagree with the statement (8%). These numbers imply that there may be still obstacles or misconceptions, such as gender role preconceptions, organizational impediments, or unconscious bias, especially a preference for male leadership, even in these short-term commitments as project management brings into the study.

6.2.2. General Diversity Practices in Work Environment

Statement 10: 'Male staff accepts women as equal on various tasks conducted in the professional life'

The fact that more than 70% of respondents agreed with the statement suggests that gender equality is positively seen within the project management framework and may imply that male employees believe that female team members from any position, are just as capable and competent as male team members at carrying out their jobs successfully. As seen in Figure 11, a share of 82.9% of male respondents accepted that they show full collaboration and fair acceptance during work performance, sharing responsibilities equally with women team members.

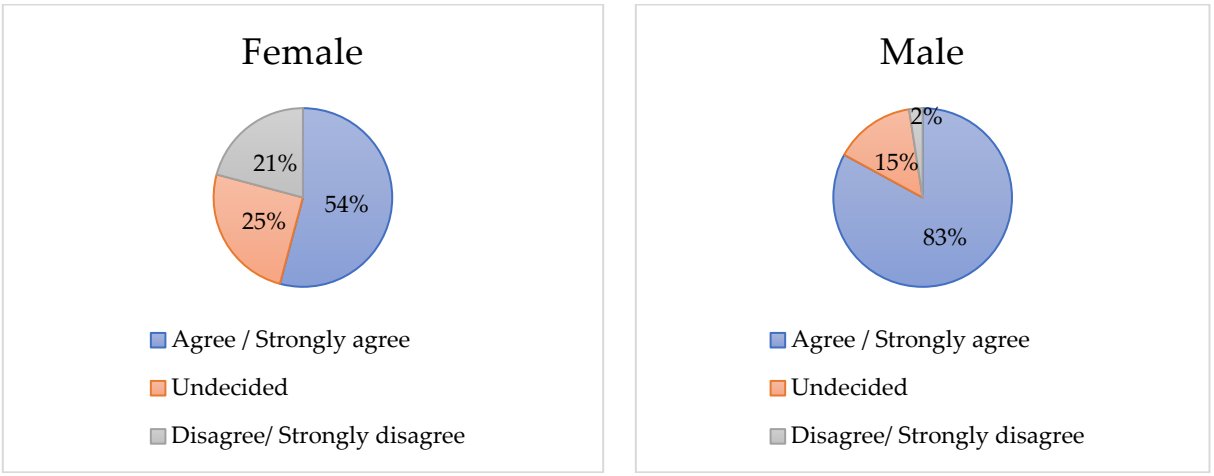


Figure 11. Distribution of responses regarding gender equality, grouped by gender. (Source: authors' processing of collected data from applied survey).

Alternatively, most women respondents accepted that there may be a decline in the traditional biases that have so far linked particular roles or duties exclusively to men, as in the project management case, although high expertise is usually required. Male employees may have implicit or explicit perceptions that women are less qualified for specific activities, especially in leadership, technical, or physically demanding roles, including in the present case study for project implementation, according to 9% of negative replying respondents, the majority of whom are women. In this case, the disagreement might not reflect an overall bias but rather points out specific areas where inequality may be more pronounced, issuing especially from previous professional experiences and not from this specific case study of project implementation.

Statement 11: 'The male counterparts perceive the female team members as a threat in competition for better positions'

The statement, which most respondents disagree with (57.5%), may indicate that male employees do not perceive female team members as a competitive threat and the workplace atmosphere is more helpful and collaborative when it comes to career growth and competition for accessing higher positions. Table 10 shows that the majority of respondents, both male and female, across all occupations, disagreed with the statement that women team members are considered a threat in competition with male counterparts, marking a significant sign of respect and cooperation under the project framework, rather than gender-based competition. Additionally, this could indicate that women are not seen as a threat to an established male-dominated hierarchy, being a proper sign of gender stereotype dilution.

Table 10. Distribution of responses regarding gender competition in the team, grouped by occupation and gender.

	Male	Female	Prefer not to Say	Education	Port Services	Seagoing Professional
Strongly Disagree	19	10		15	9	5
Disagree	6	3		6	1	2
Undecided	8	5	1	9	2	3
Agree	5	6		7	3	1
Strongly Agree	3			1	1	1

(Source: authors' processing of collected data from applied survey).

The fact that a sizable minority (21.2%) still views female competition as a danger for their own ascension, and that male employees are alarmed by the possibility of female coworkers achieving higher positions, may indicate underlying problems with gender bias or insecurity.

The significant percentage of respondents who are undecided (21.2%) may suggest that a part of team members is still reluctant to agree or disagree because of fear of being criticized for having possibly controversial or unpopular opinions, mostly because project implementation is defined by short-term commitments and less available time for organizational culture adjustment. Additionally, the respondents may not view the gender issue as opposing a significant influence promoting competition between team members, moreover because the workplace culture is often collaborative rather than highly competitive.

Statement 12: 'Male professionals are preferred even if the female team members have the same qualifications'

Gender bias may not be as pervasive in respondents' views or workplace practices, as the majority do not think that male professionals should be given preference over female professionals with equal qualifications. The respondents' disagreement reveals strong support for merit-based selection procedures, where performance, credentials, and abilities are more important than gender or other diversity issues, especially in the case of project implementation, where team members' expertise is crucial for the final quality of outcomes.

The gender preference bias is opposed by both men and women, as revealed by the distribution rate of disagreement (55% men and 45% women). Rather than being motivated only by women pursuing to promote their individual interests, this variety of responses evenly spread among men and women enhances the credibility of having a communal opinion.

The poll of opinions gathering the remaining 43% of respondents may include individuals who agree or are indifferent to this assertion and should be taken into account even when the majority disagrees (Figure 12). This group of team members may reflect unconscious biases, remaining old beliefs, embedded by strong reluctance to fully embrace gender equality, especially in the case of junior professionals with less than a year of experience who made up the majority of those unsure and disagreeing with the statement. For this situation, project management staff can implement programs in mentorship and coaching or can impose targeted training programs for diversity management enhancement, either during the project or, strongly recommended, required as a prerequisite in the recruitment stage of project preparation.

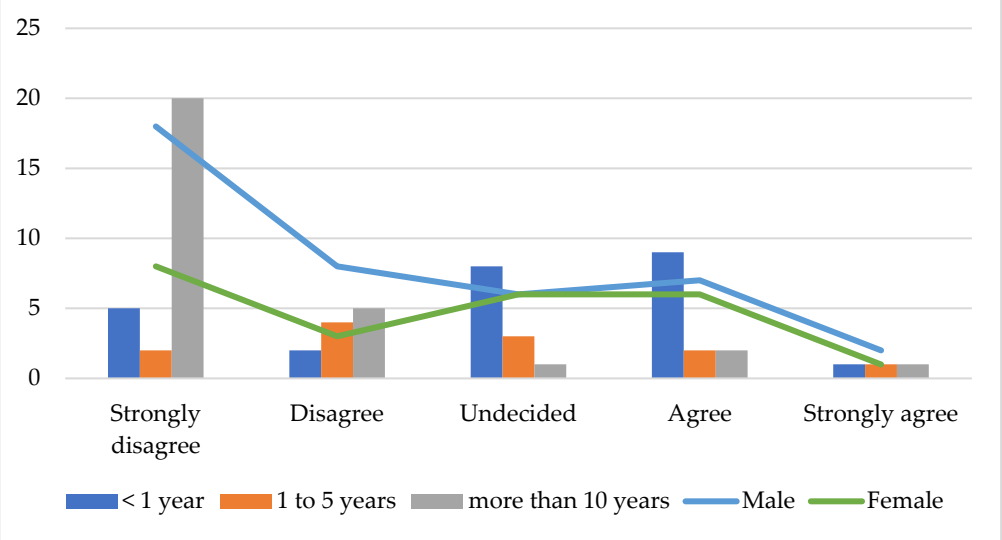


Figure 12. Distribution of responses regarding women's treatment with the same qualifications, grouped by gender and professional experience. (Source: authors' processing of collected data from applied survey).

Statement 13: 'Male professionals think that the presence of women in the project activities would limit/restrict their behaviours'

More than 65% of surveyed project team members disagreed with the above statement, indicating a favourable opinion regarding gender dynamics at the workplace (Figure 13). A high level of diversity acceptance and inclusivity attitude within the project team is demonstrated by the fact that most male professionals (70.7%) do not believe that the presence of women would limit their behaviour. Considering its operational features, project implementation assignments encourage a collaborative atmosphere where professionals of both genders should cooperate on a professional level without feeling constrained or intimidated by each other.

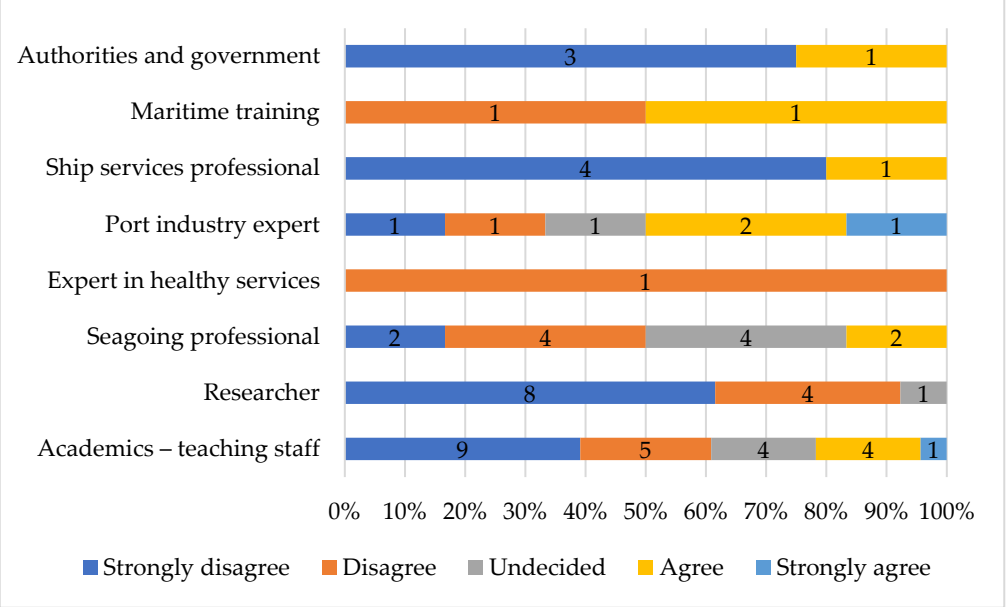


Figure 13. Distribution of responses regarding the behavioural impact of women's presence, grouped by professional domain. (Source: authors' processing of collected data from applied survey).

Based on their experiences or personal perceptions, women respondents may believe that men feel constrained or would behave differently when women are involved or partic-

ipate in project activities. Alternatively, this suggests that women may feel uncomfortable or uneasy in mixed-gender work environments. Additionally, women may perceive certain actions (such as men refraining from talking about or making jokes about particular subjects) as a kind of limitation that men may not be aware of or fully acknowledge. Due to social bias related to the males' reluctance to acknowledge that they feel constrained or affected by women's presence because it may be interpreted as improper or unprofessional, male respondents might fail to express agreement with the statement.

Statement 14: 'Women in professional life are likely to experience some forms of sexual harassment'

The majority of respondents (62%) think that sexual harassment against women is unlikely to occur in their workplace environment during project implementation. This low level of agreement may reflect background perceptions more than actual prevalence, as research frequently demonstrates that harassment situations can remain unreported [18,52].

Table 11 shows that 54% of female respondents disagreed, 33% were undecided, and 13% agreed with the statement. Women are likely to have first-hand knowledge, and it might imply that people think that the workplace is generally safe or free of gender problems. Seven percent of respondents agreed with the assertion, and the majority had less than a year of experience. According to their impressions from the media, societal narratives, or past experiences in other contexts (such as internships or school settings), newcomers may agree with the statement. This can indicate that anti-harassment measures were not well communicated or enforced during project activities, which left junior professionals hired in the project feeling insecure or exposed.

Table 11. Distribution of responses regarding the probability of facing sexual harassment, grouped by gender and professional experience.

	Male	Female	<1 Year	1 to 5 Years	6 to 10 Years	More than 10 Years
Strongly Disagree	20	7	6	2	2	17
Disagree	8	6	3	6	2	3
Undecided	11	8	13	3		4
Agree	1	3	3			1
Strongly Agree	1			1		

(Source: authors' processing of collected data from applied survey).

6.2.3. Gender Equality and Gender Bias in Project Implementation

Statement 15: 'The successful achievements of a female team member are usually ignored or diminished'

The survey asked the participants to respond to two questions that addressed this assertion, regarding both the perceived attitudes against women's achievements and against women's failures. For the first question, the responses indicate a favourable opinion regarding women's treatment as project team members, when nearly 75% of respondents disagree with the statement regarding the persistence of an ignoring attitude toward women's successful achievements (see Figure 14). Positive gender relations and proper cultural perceptions that recognize the contributions of all project team members, regardless of gender, are reflected in this outcome.

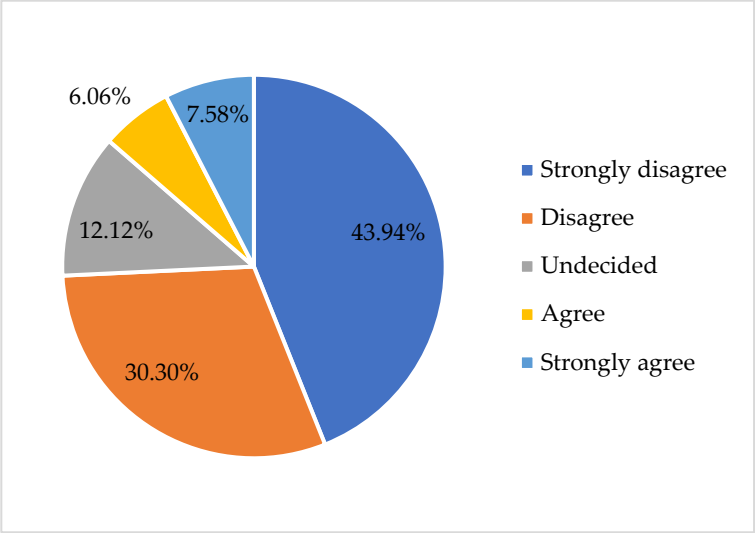


Figure 14. Distribution of responses regarding the perception of women's achievements. (Source: authors' processing of collected data from applied survey).

Undecided respondents may not have direct experiences or observations of such issues, but they also do not rule them out. Uncertainty about whether these biases exist or are systemic issues, determined alternatively by the lack of exposure to such actions, could be invoked as the real cause of the respondents' hesitancy.

Statement 16: 'When a female crew member makes a mistake, the feedback and reaction are exaggerated'

Consequently, according to the survey's findings, for the statement regarding the persistence of exaggerated attitude when women team members make a mistake during project implementation activities, most participants (70%) disagree with the claim that female team members' accomplishments are downplayed or disregarded while their errors are seen with exaggeration (see Figure 15). This indicates that a sizable percentage of the responding women do not think that female accomplishments are overlooked or their errors are overstated, as a share of 31% out of the 70% who disagreed are in fact women. The disagreement, however, may indicate that such prejudice is not generally acknowledged or observed by the majority, rather than necessarily proving its absence. Moreover, 18% of respondents from all professional groups were undecided. Even though the majority disagreed, it is vital to take into account the opinions of the minority (nearly 12%, or equal numbers of men and women) who agreed with the statement, since their experiences might still highlight some related problems that would need attention during project implementation.

Statement 17: 'The female employees are usually paid less, even if they do the same job as men'

Although the statement may imply an idea of wage parity, it does not necessarily need to be validated, as first, most respondents (63%) disagree, and second because in the case of project management, the opinions are mostly based on past experiences, since the salary rates are equal regardless of gender within the EU project implementation framework. Figure 16 suggests that male staff are more likely than women to deny the existence of pay inequality, with a significantly higher percentage of men (68.29%) disagreeing or strongly disagreeing than women about disparities in work rewards (54.17%). This implies that men are less likely to notice or understand gender-based differences in payment, including for project management as for other domains [11,12].

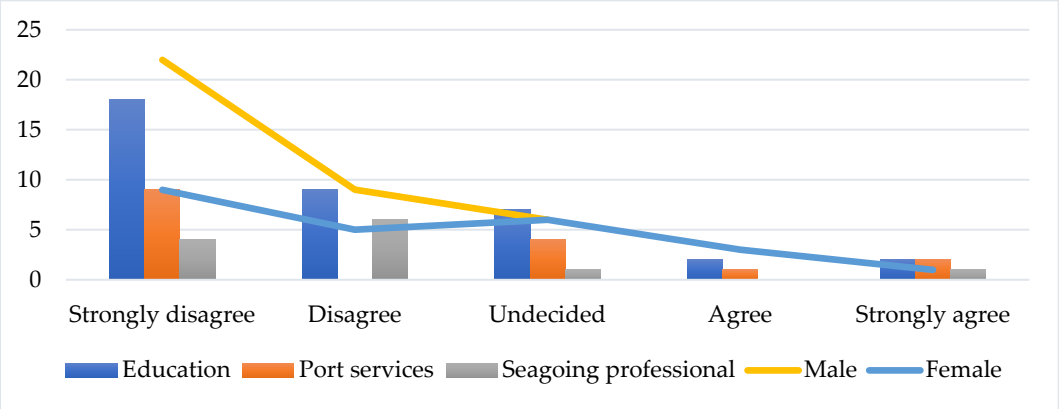


Figure 15. Distribution of responses regarding the perception of women's professional errors, grouped by gender and professional field. (Source: authors' processing of collected data from applied survey).

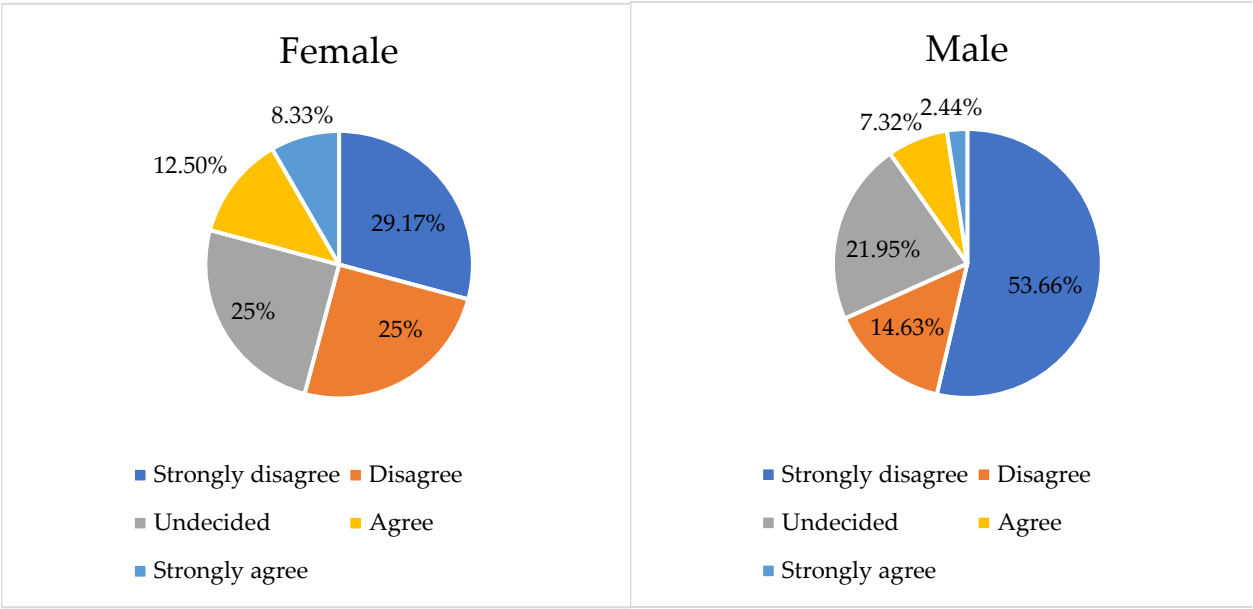


Figure 16. Distribution of responses regarding women's work rewarding, grouped by gender. (Source: authors' processing of collected data from applied survey).

Women are more likely than men to express either agreement or uncertainty on this topic; their agreement rate is higher (20.83%) than men's (9.76%), but a sizable percentage of women (25.00%) are still unsure, which suggests either a lack of information on real awarded salaries or individual doubts about payment equity still exist. While the majority of both men and women disagree with the statement, the notable differences in agreement and undecided responses between genders may indicate underlying perceptions of gender pay inequity. These perceptions are crucial to address, even if they do not necessarily reflect the reality of pay practices. For successful implementation of a project, it is then recommended to apply a more aggressive policy for institutional transparency regarding the rewarding procedure and the salary scale publication to tackle this misconception or to avoid any possible deviations.

Statement 18: 'I think the behaviour of male staff discourages the female staff to perform better'

Significantly more respondents, especially from the education and research group, strongly disagreed with the statement regarding the discouraging attitudes against women project team members, being followed by the project stakeholders originating in other

professional fields, such as port services staff and seagoing professionals (see Figure 17). Male behavior is not seen by many project team members from these professional domains as being a significant deterrent factor against women's achievements or as hampering factors of their better performance within the team [53].

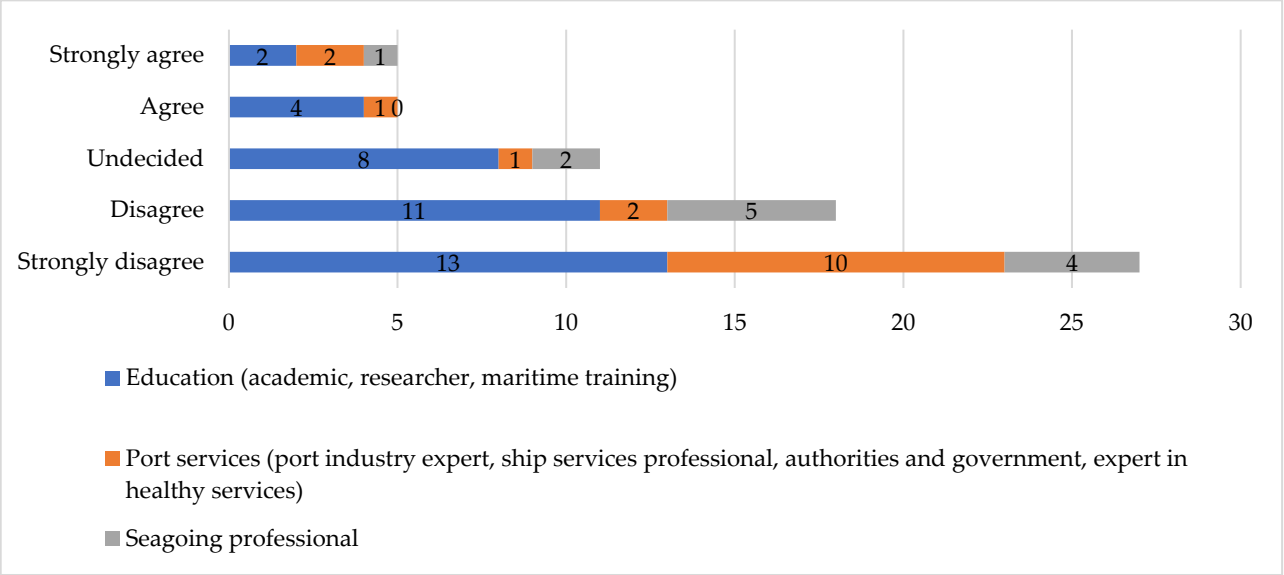


Figure 17. Distribution of responses regarding the discouraging attitude against women, grouped by professional field. (Source: authors' processing of collected data from applied survey).

Although in other domains, the topic is still an important question mark (Johnson et al., 2018), this picture may suggest that even if problems occur, they are less obvious in the project implementation framework, where the workplace gender culture typically foresees diversity as helpful, not as an issue [54].

Statement 19: 'I feel the women personnel must work harder to be accepted as equal by the male counterparts'

Male team members, particularly those with more professional experience, strongly disagree with the statement regarding women's acceptance as equal in all respects (Table 12). This perception should be attributed to the fact that male professionals, with longer careers, do not think that women need to put in more effort to be treated equally in the project framework, as the required expertise is usually higher than in other domains [55–58].

Table 12. Distribution of responses regarding women's acceptance, grouped by gender and professional experience.

	Male	Female	Prefer Not to Say	<1 Year	1 to 5 Years	6 to 10 Years	More than 10 Years
Strongly Disagree	19	6		7	1	3	14
Disagree	8	6	1	3	4	1	7
Undecided	12	4		10	3		3
Agree	1	7		4	3		1
Strongly Agree	1	1		1	1		

(Source: authors' processing of collected data from applied survey).

Where this perception rate decreases, this may indicate a lack of knowledge and understanding of the difficulties diversity faced by female colleagues regarding the real belief in workplace equality as part of work culture [53]. Moreover, even in the project management professional area, the item responses show that the opinions of women are

considerably different on this matter, with some admitting that more work is required to be treated equally (Table 12). This may be a reflection of actual general prejudice about the fact that universal equality may not yet be attained, considering the entire spectrum of professions and work areas [23]. Stronger disagreement is more common among those with greater experience, especially men, this applying also to the project implementation professional domain [12], this being possibly due to lessened awareness of difficulties over time in such work environments considered to be fair as a prerequisite. In such perspective, many indecisive answers, particularly from younger workers (less than a year), revealed a lack of knowledge regarding workplace equality from the beginning of their employment. This issue can be addressed by introducing gender provisions in the employment contract and also by introducing this type of knowledge to be assimilated as part of the code and conduct, and further, as part of organizational culture, in the work adjustment programs.

Statement 20: 'I feel the women personnel must work harder to be accepted as equal by their supervisors'

In Figure 18 are highlighted the findings for the statement related to the project managers' attitude regarding gender equality in the workplace. Most respondents (66%) disagree or strongly disagree with this statement, indicating that they think managers use to treat female employees fairly in the team during project implementation.

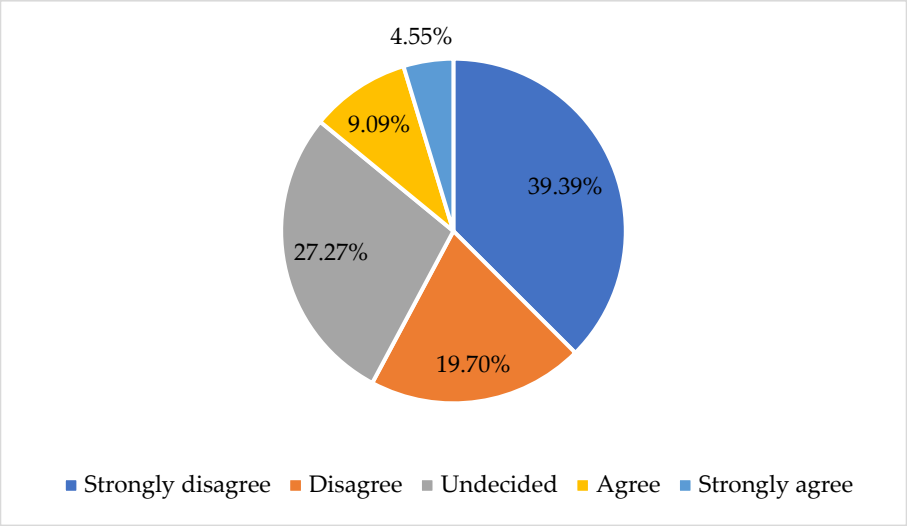


Figure 18. Distribution of responses regarding the supervisors' perception regarding gender equality. (Source: authors' processing of collected data from applied survey).

The 27% of respondents who were unsure, however, suggested that there is still some ambiguity or variation in their achieved experiences, which may not be directly connected to the project management framework. On the other side, there are still certain impressions of inequity that may require attention, as seen by the lower percentages of full agreement with treatment disparities (13% combined). Here the suggestion is focused on clear KPI—key performance indicators evaluation processes to be implemented in a fair and transparent manner, following the seafaring field examples [59].

Statement 21: 'The usual professional practice is to consider that a woman in a team improves relations among the team members and make the group more effective'

As reflected in Figure 19, most professional groups of project stakeholders seemed to favorably perceptive the participation of women in project teams, in terms of group dynamics and effectiveness, with general agreement (even strong agreement), outweighing the opposed attitudes. Although, the highly relevant percentage of undecided answers may suggest that many experts might not have enough knowledge or expertise to make a definitive judgment.

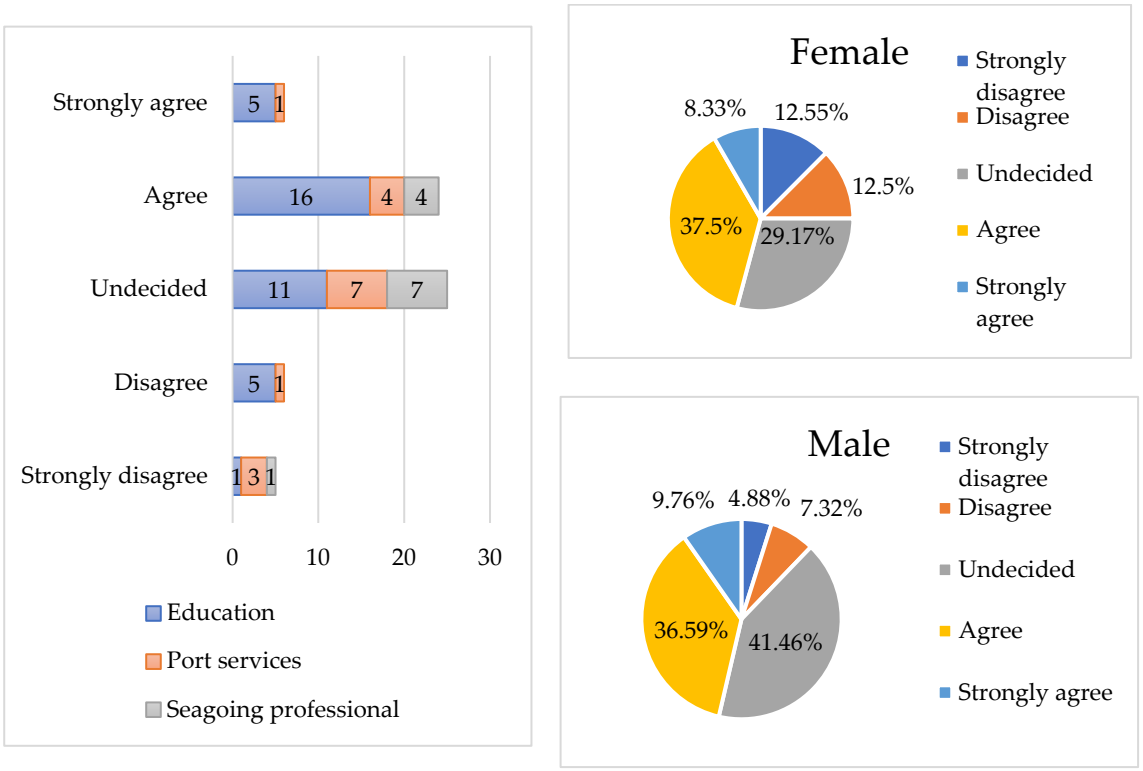


Figure 19. Distribution of responses regarding the positive influence of women as team members, grouped by gender and professional field. (Source: authors' processing of collected data from applied survey).

Looking at the women's responding replies, 29% were unsure and 45% agreed with the statement; by comparison, regarding the male team members, 41% were unsure and 46% agreed. Professionals working in education and maritime transportation were more likely to concur, whereas those working in port services were more split between "Agree" and "Undecided", following the professional trend in gender attitude [56–58]. This could be a result of exposure to various team arrangements across industries or variations felt by the employees during their careers, in the workplace dynamics.

Statement 22: 'Women working in a team have fewer chances to be promoted to higher positions than males, having less professional chances'

The statement was disputed by more than 60% of respondents, of which 64.3% of those who disagreed had more than six years of work experience (see Table 13). Therefore, the perception of gender parity in promotions is suggested by most of the respondents' belief that women working in a team do not have fewer opportunities to be promoted than males. This picture may reveal a positive perspective for equality in different workplaces or prove that opportunities for promotion and career advancement are mostly determined by merit or by other objective criteria, rather than by the person's gender.

Table 13. Distribution of responses regarding the promotion policy, grouped by gender and professional experience.

	Male	Female	Prefer not to Say	<1 Year	1 to 5 Years	6 to 10 Years	More than 10 Years
Strongly Disagree	14	6		6		2	12
Disagree	14	7	1	4	5	2	11
Undecided	7	5		7	3		2
Agree	4	5		6	3		
Strongly Agree	2	1		2	1		

(Source: authors' processing of collected data from applied survey).

Focused on the project implementation perceptions and attitudes, women are not at a disadvantage when it comes to promotions, according to more than half of the female respondents; the other respondents either agree (25%) or are unsure. Women's different opinions may point to a complex perspective, once even while some people believe that opportunities are equal, others are still perceiving obstacles considering their experience. Of course, this lack of certainty is due to the fact that the assertion is overseeing more the chain of professional path than the specific assignment in the project, but the attitude and perceptions are important for project management considering the short-term appointment and the imperative for quality in results [20].

Statement 23: 'There is an atmosphere in the work environment, where everybody can express freely his/her opinion with no prejudice in regard of gender'

The majority of participants believe that their workplace is gender inclusive and the organizational policy within the project implementation framework encourages free speech, with 68.18% of respondents agreeing or strongly agreeing (Table 14). A significant degree of neutrality or uncertainty is indicated by the 18.18% of respondents who were unsure, suggesting that not all respondents consistently experienced workplace inclusion and the right communication policies in place during their careers. Even though most comments are positive, the indecisive and negative ones show where there is a need to improve workplace inclusivity and to ensure that all team members feel free to give voice to their thoughts without fear of repercussion, in order to assure the accuracy of task accomplishment and the quality of project results [18].

Table 14. Distribution of responses regarding the quality of communication, grouped by gender.

		Gender (Frequency)		
	Total (%)	**Male**	**Female**	**Prefer Not to Say**
Strongly Disagree	4.55%	2	1	
Disagree	9.09%	3	2	1
Undecided	18.18%	6	6	
Agree	28.79%	8	11	
Strongly Agree	39.39%	22	4	

(Source: authors' processing of collected data from applied survey).

6.2.4. Sexual Assault and Sexual Harassment (SASH) Policies and Project Management Procedures Implementation

Statement 24: My employer has a clear equal opportunities/mutual respect policy in place

A significant majority of respondents (Table 15) feel that their employer has a clear equal opportunity and mutual respect policy in place, as evidenced by the combined share of 68.18% of responses for 'Agree' and 'Strongly Agree' on the scale grade. Men may view the policy more positively than women, as seen by the larger percentage of men in the 'Strongly Agree' group of collected options. This might be a result of variations in how

these regulations are explained, applied, or perceived at work, widely oriented toward male staff [11].

Table 15. Distribution of responses regarding the equal opportunities policy, grouped by gender.

	Total	Male	Female	Prefer Not to Say
Strongly Disagree	7.58%	4.55%	1.52%	1.52%
Disagree	3.03%	1.52%	1.52%	
Undecided	21.21%	12.12%	9.09%	
Agree	21.21%	10.61%	10.61%	
Strongly Agree	46.97%	33.33%	13.64%	

(Source: authors' processing of collected data from applied survey).

The 21.21% of respondents who were unsure about the level of provided opportunities may point to communication failures about the real need for these policies to be widely known and applied as part of organizational culture. Although the disagreement rate is minimal (10.61%), the fact that almost one out of ten respondents expressed their disagreement related to this statement may suggest that some stakeholders involved in the project implementation as team members or beneficiaries still believe their employer has either adopted an unsatisfactory policy regarding equal opportunities/mutual respect or has an unclear and non-transparent way of promoting this policy in the organization. In the case of the project implementation framework, the team members should be better informed about the gender policy implementation within the quality management policy to improve their knowledge, attitude, and perception regarding the gender aspects of the professional profile.

Statement 25: 'There is a clear organizational procedure to claim gender issues, discrimination situations or other biases on diversity management (SASH internal policy)'

The process is generally viewed more favorably by men, with a higher percentage strongly agreeing, confirming that the SASH internal policy is fair and effective. Conversely, women are less self-assured in this direction, as evidenced by the higher number of respondents who selected 'Strongly Disagree' or 'Disagree' (Figure 20). These differences may suggest that there may be gender-based disparities in the organization's procedure for communication, comprehension, or perception of women's rights and possibilities to claim for gender discriminative acts during project implementation.

There is a need for more clarity and communication of the SASH internal policy, as seen by the large percentage of male respondents who were unsure (31.71%) and by the absence of unanimous agreement among female respondents. Females' comparatively high disagreement rate (16.67%) raises the possibility that the monitoring process in place does not sufficiently address their concerns or that it is not seen as a practical or approachable way to deal with gender-related issues.

Statement 26: 'My employer has established mechanisms to report incidents on psychological safety, bulling, and harassment (SASH)'

As depicted in Table 16, the overall positive rating of about 50% is roughly the same for men and women, but women are more likely to be unsure, which suggests a real need for improving the SASH policy dissemination, the facilitation of internal communication policy, and the implementation of specialized strategies and procedures to get women employees to learn more about the reporting mechanism [14]. Significant hesitation is displayed by employees with less than five years of experience (43%), indicating that businesses should enhance their onboarding and awareness initiatives to guarantee that new employees are aware of these processes, especially for project implementation, in which case the commitments are for a short run, with a high number of involved team members for punctual tasks and activities.

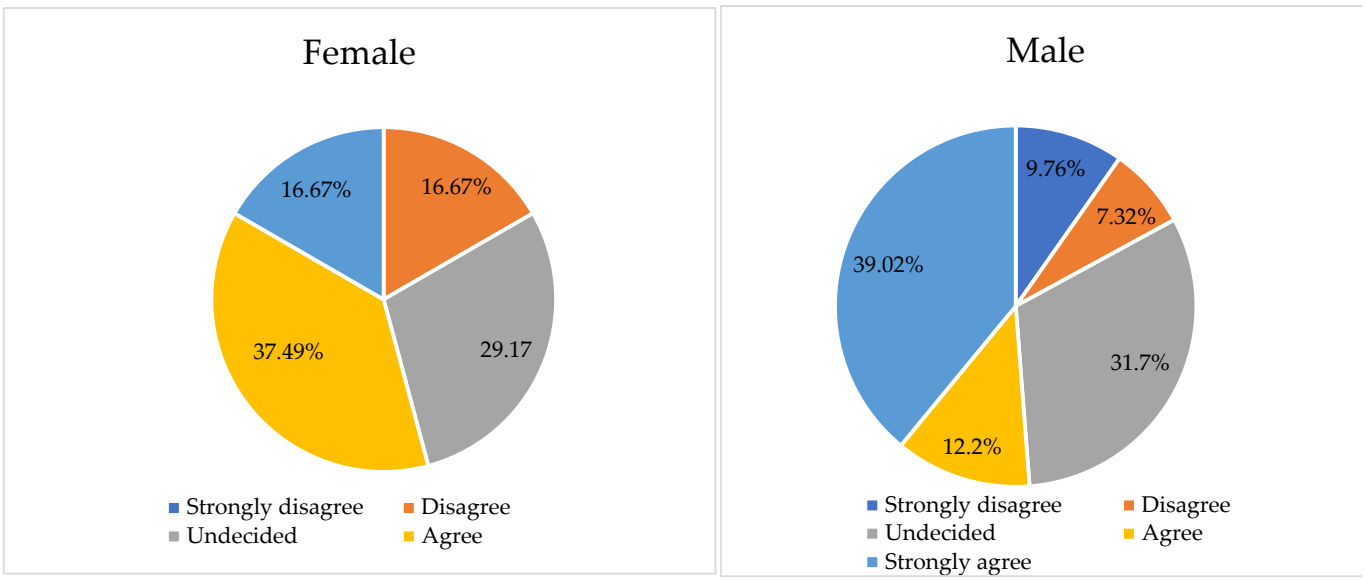


Figure 20. Distribution of responses regarding the SASH policy implementation, grouped by gender. (Source: authors' processing of collected data from applied survey).

Table 16. Distribution of responses regarding the implementation of the SASH reporting mechanism, grouped by gender and by professional experience.

	Gender			Experience			
	Male	**Female**	**Prefer Not to Say**	**<1 year**	**1 to 5 Years**	**6 to 10 Years**	**More than 10 Years**
Strongly Disagree	5			2		2	1
Disagree	3	3	1	2	2		3
Undecided	12	9		11	5		5
Agree	8	7		7	3		5
Strongly Agree	13	5		3	2	2	11

(Source: authors' processing of collected data from applied survey).

The higher likelihood of strong agreement rate among the project team members with more than ten years of experience (44%) may indicate a better level of familiarity or higher trust in the procedures and in the functionality of the organizational systems. Nonetheless, the existence of opposing viewpoints within the pool of respondents (around 16%) underlines the necessity of guaranteeing uniformity in the implementation of SASH policies at all levels, before and during the project implementation phases. A recurrent theme of inadequate knowledge or clarity on these procedures is revealed by the indecisive rates across several categories (31% men, 37.5% women, and approximately 43% in the case of less experienced employees). Despite being generally modest, the recording of a disagreement rate indicates that some employees still believe the procedures are inadequately implemented or ineffective, or they simply are not acknowledged about the existence of such policy and related procedure. As observed in other studies, the need for prior training in gender aspects of the work environment, before the project implementation start as a prerequisite for any further assignment, becomes imperative, in order to assure proper knowledge, attitude and perception regarding the efficiency of the SASH policy on the level of all project team members as part of the quality assurance strategy [21,60].

Statement 27: 'Always my employer, takes effective actions when an incident on psychological safety, bulling and harassment (SASH) is reported'

Compared to women, men are more likely to 'strongly agree' (39.5%) that project management staff is acting effectively in regard to the SASH reporting procedure, demon-

strating greater confidence in the system reaction (Table 17). Less trust or satisfaction among female team members is suggested by the fact that only 8.3% of women respondents strongly agree and a larger percentage are indecisive (33.3%) or even dissatisfied (16.6%). This gender gap may suggest that employer practices are not seen as fair or successful by both genders, coming mostly from past experience, rather than from the actual project implementation experience [54].

Table 17. Distribution of responses regarding the SASH tackling measure, grouped by gender and professional field.

	Male	Female	Prefer Not to Say	Education	Port Services	Seagoing Professional
Strongly Disagree	2			1		1
Disagree	3	2	1	3	2	1
Undecided	12	8		10	6	4
Agree	9	12		14	4	3
Strongly Agree	15	2		10	4	3

(Source: authors' processing of collected data from applied survey).

On the other side, as counterpart, a sizable percentage of respondents, counting 31.6% of men, 33.3% of women, and between 30% to 37% of respondents in all professional fields, are still unsure about the tackling measures' effectiveness in case of SASH incidents occurring. Despite being comparatively low (13% for men, 16.6% for women, and between 12.5–16.7% for job roles), dissatisfaction rates nevertheless indicate the existence of shortcomings in the way that SASH-related measures are implemented and fairly distributed, under questioning the effectiveness of expected results. These statistics draw attention to a persistent problem with transparency, communication, or faith in the efficacy of employer initiatives as previously reported in the professional studies for project implementation [11,12].

6.3. Comparative Response-Rate Analysis and Thematic Interpretation

To evaluate the effectiveness and perceived equity of gender policies in project implementation, the survey responses were disaggregated by gender and professional seniority, offering insights into how different demographics engage with organizational justice and gender-related protocols.

6.3.1. Comparative Chart: Gender-Based Perceptions

The chart from Figure 21 illustrates the gender differences across four key dimensions of the survey:

a. *Trust in SASH policies*: 72.8% of male respondents expressed agreement or strong agreement that institutional procedures for reporting sexual harassment and ensuring safety are effective, compared to only 43.3% of female respondents—this highlights a significant gender confidence gap in institutional protections;
b. *Task equality perception*: a majority of male participants (56%) believed that task allocation is gender-neutral, while only 29% of female respondents shared this view, suggesting persistent perceptions of hidden bias in operational decisions;
c. *Willingness to report discrimination*: male respondents showed a slightly higher readiness (84.7%) than female respondents (71.8%) to report discriminatory incidents. This indicates that women may still face structural or cultural barriers to speaking up, including fear of retaliation or lack of institutional trust [54];

d. *Recognition of female contributions*: while 75% of men disagreed that female achievements are diminished, only 50% of women shared this confidence—this disparity supports research indicating that invisible labor and gendered devaluation are common in mixed-gender teams [26].

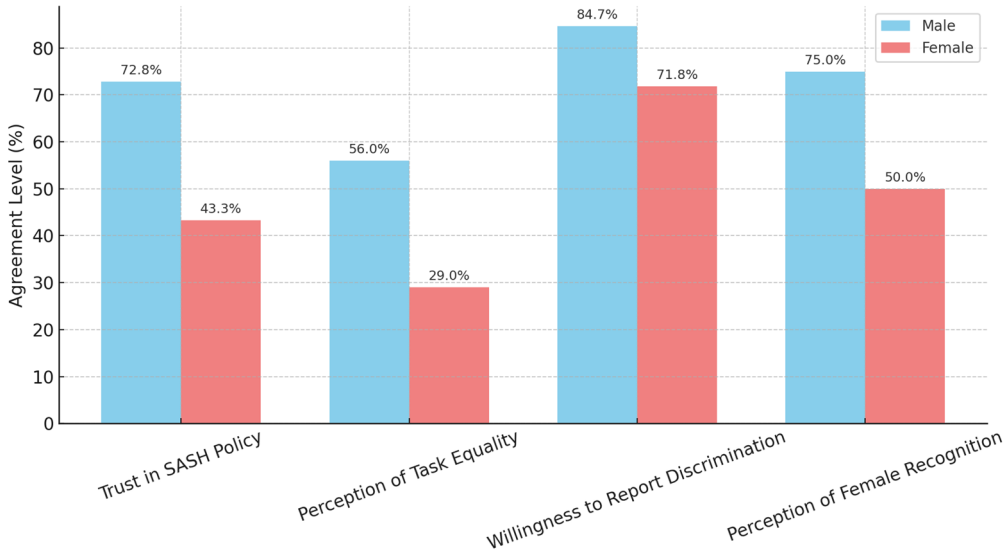


Figure 21. Comparative response rates on survey categories, grouped by gender. (Source: authors' processing of collected data from applied survey).

These findings provide empirical support for Hypotheses H1 and H2, affirming that gendered perceptions of equity, fairness, and safety diverge significantly, even within policy-mandated inclusive environments.

6.3.2. Professional Seniority and Inclusivity Values

Younger professionals (<1 year experience) reported a stronger commitment to speaking out against discrimination, with 75% indicating they would report gender bias when witnessed. In contrast, senior professionals showed slightly less proactive behavior (64%), possibly reflecting organizational fatigue or cautious pragmatism shaped by experience. This aligns with generational trend findings in workplace diversity literature and supports Hypothesis H3 regarding younger stakeholders as catalysts for gender equity culture change [1].

6.3.3. Thematic Interpretation from Open-Ended Feedback

Open responses to Statement 28 revealed several recurring themes:

- lack of visibility: respondents, especially female, mentioned their contributions being overlooked or undervalued, consistent with the "gender discount" phenomenon in collaborative projects [12];
- barriers to reporting: several individuals admitted they would remain silent when observing gender discrimination due to fear of not being supported or taken seriously;
- mentorship void: younger women noted the absence of senior female role models as a barrier to envisioning leadership advancement within their domain.

These thematic findings echo intersectional and cultural limitations in many project environments, where compliance structures exist but lived inclusivity remains incomplete [2,40].

6.3.4. Multi-Layered Analysis of Gender Perceptions by Experience Level

To gain deeper insight into how gender and professional seniority intersect to influence perceptions of equity in project environments, a multi-layered comparative analysis was

conducted. The chart from Figure 22 breaks down four key variables across junior and senior male and female participants, namely: trust in institutional protection, task fairness, discrimination response, and recognition of women.

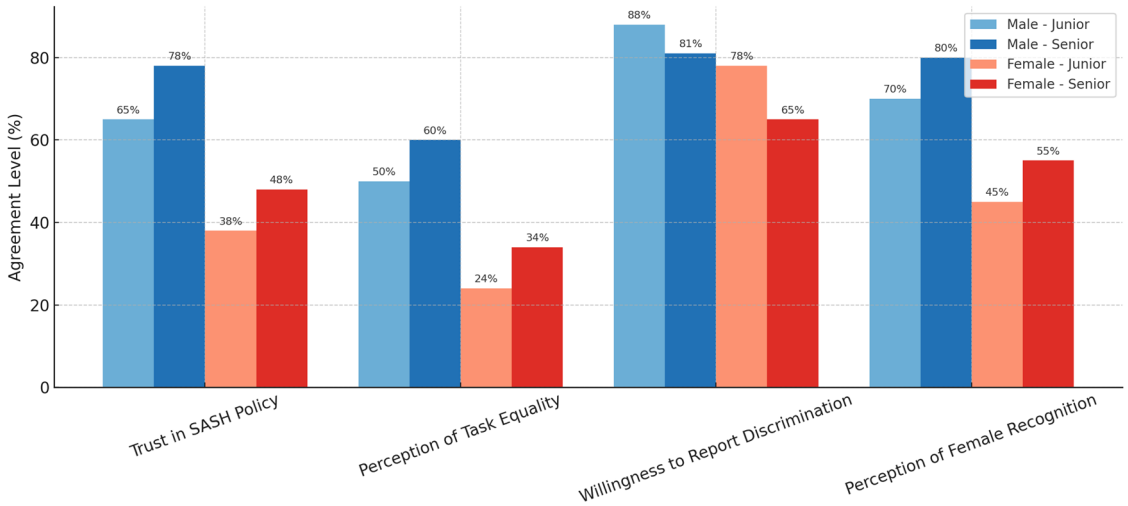


Figure 22. Multi-layered analysis of gender perceptions by experience level. (Source: authors' processing of collected data from applied survey).

The key interpretations of the obtained values are synthesized as follows:

1. *The trust in SASH policy*: senior males showed the highest trust (78%), followed by junior males (65%); among women, senior females were slightly more trusting (48%) than junior females (38%). This suggests experience increases trust, but gendered confidence gaps persist [54];
2. *Perception of task equality*: agreement increases with experience for both genders, but a 30% gap remains between senior men (60%) and senior women (34%). This supports the notion that structural biases may be normalized over time or selectively perceived [2];
3. *Willingness to report discrimination*: junior males (88%) and junior females (78%) are more likely to report bias compared to their senior counterparts (81% and 65%, respectively). This generational trend suggests younger employees are more values-driven and inclined toward equity-based accountability [1];
4. *Perception of women recognition*: senior males (80%) strongly believe that women are equally recognized, compared to senior females (55%). The 25-point disparity confirms an enduring issue of perceptual mismatch, where men may overestimate institutional fairness, while women perceive a gap in acknowledgment and advancement [12].

6.3.5. Statistical Analysis of Gender-Based Perception Gaps in Project Management

To explore the statistical significance of gender-based perception differences regarding equity, safety, and recognition in project contexts, this study conducted a quantitative comparative analysis using independent samples *t*-tests. The analysis considered average agreement levels on four core KAP (Knowledge, Attitude, Practice) indicators between male and female respondents, further disaggregated by professional seniority (junior vs. senior).

The indicators tested included the following factors as studied in the section above:

1. Trust in SASH (Sexual Assault and Sexual Harassment) policy;
2. Perception of task equality;
3. Willingness to report discrimination;
4. Perception of women's recognition.

Each group's score was computed as the mean of responses from junior and senior professionals of the same gender. The Likert scale used ranged from 1 (strongly disagree) to 5 (strongly agree), with values normalized as percentage agreement for comparative analysis. The chart from Figure 23 visualizes the average agreement levels by gender, with *p*-values annotated to indicate statistical differences.

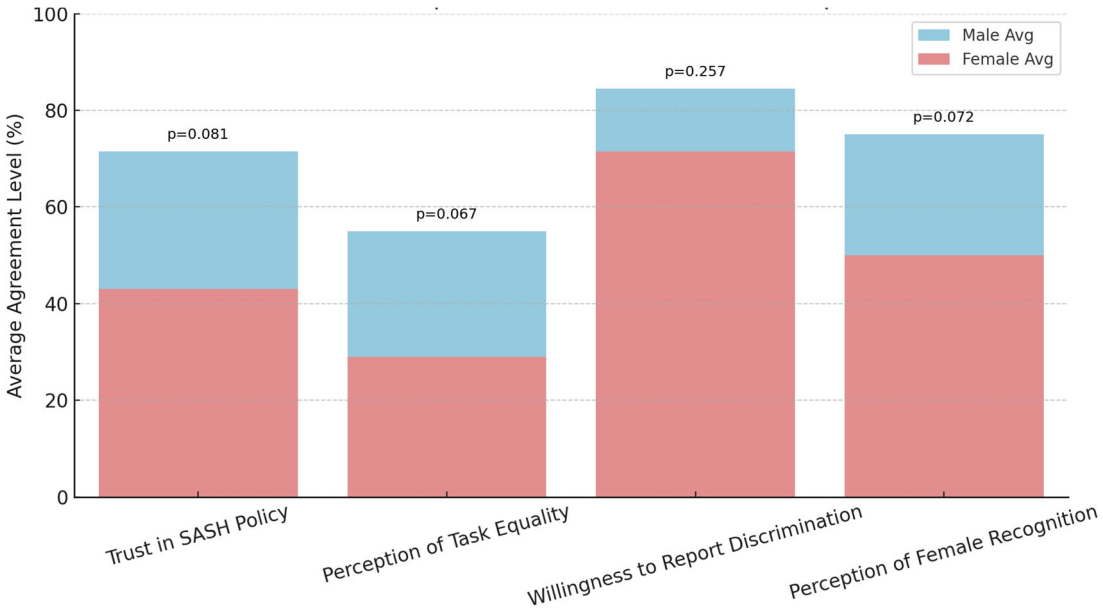


Figure 23. Statistical comparison of gender-based perceptions in project management. (Source: authors' processing of collected data from applied survey).

The statistical results from Table 18 reveal moderate to strong perceptual disparities between male and female respondents on most items, supporting Hypotheses H1 and H2 of the study. While none of the results met the conventional threshold for significance ($p < 0.05$), three of four indicators—SASH trust, task equality, and female recognition—yielded *p*-values under 0.10, indicating near-significance and strong trends worth further investigation.

Table 18. Statistical values resulting from *t*-test.

Survey Category	Male Avg (%)	Female Avg (%)	T-Statistic	*p*-Value
Trust in SASH Policy	71.5	43.0	3.48	0.081
Perception of Task Equality	55.0	29.0	3.68	0.067
Willingness to Report Discrimination	84.5	71.5	1.76	0.257
Perception of Female Recognition	75.0	50.0	3.54	0.072

(Source: authors' processing of collected data from applied survey).

a. *Trust in SASH policy:* men (71.5%) expressed considerably higher trust than women (43.0%) in institutional mechanisms for addressing harassment and misconduct—this supports findings from Johnson et al. (2018) that gender influences confidence in procedural justice, particularly regarding safety policies [54].
b. *Perception of task equality*: a gap of 26 percentage points was observed, with men perceiving task allocation as more equitable (55%) than women (29%)—this aligns with role congruity theory, which posits that gender stereotypes distort both opportunity and perception in leadership contexts [2].

c. *Willingness to report discrimination*: while men (84.5%) and women (71.5%) both showed high willingness, the difference was not statistically significant ($p = 0.257$)—this suggests attitudinal alignment but potential differences in behavioral follow-through, possibly shaped by fear of retaliation or historical experience [1].
d. *Perception of female recognition*: male respondents (75%) believed women were recognized fairly, versus only 50% of female respondents—this perception mismatch echoes the literature on invisible labor and the under-acknowledgment of women's contributions in mixed-gender environments [12].

The analysis reinforces the value of gender-disaggregated quality metrics in project management and confirms that surface-level compliance with EU equity standards does not guarantee perceived fairness or safety among all team members. Embedding validated, statistically sensitive gender assessment tools, such as the one proposed in this study, can support early detection of workplace inequities and enhance transparency, trust, and inclusive leadership in project implementation.

6.3.6. Multivariate Analysis of Gender Perceptions in Project Management

To deepen the interpretive power of the gender-disaggregated data, a multivariate linear regression model was constructed by the authors to evaluate how two independent variables—gender and professional seniority—along with their interaction, predict levels of perceived recognition of women's contributions in project environments. The regression equation is specified as:

$$Y = \beta_0 + \beta_1(\text{Gender}) + \beta_2(\text{Seniority}) + \beta_3(\text{Gender} \times \text{Seniority}) + \varepsilon \quad (1)$$

where gender = 0 for male, 1 for female; seniority = 0 for junior, 1 for senior.

This regression, calculated in Table 19, confirms that gender alone is the strongest predictor of perceived recognition in project contexts. Female respondents, across both experience levels, perceive significantly less recognition of women's contributions than their male counterparts, supporting both Hypotheses H2 and H5. The model reveals the following conclusions:

- a junior male baseline respondent would score 70%;
- a junior female would score 45% ($70 - 25$);
- a senior male would score 80% ($70 + 10$);
- a senior female would score 55% ($70 - 25 + 10$).

Table 19. Statistical values from multivariate linear regression model.

Variable	Coefficient (β)	Interpretation
Constant	70.0	Baseline score (junior male)
Gender (Female = 1)	−25.0	Being female is associated with a 25-point decrease in perceived recognition
Seniority (Senior = 1)	+10.0	Being senior is associated with a 10-point increase
Gender × Seniority	~0.0	No meaningful interaction effect beyond main terms

(Source: authors' processing of collected data from applied survey).

These results align with role congruity bias literature, reinforcing that inclusion in policy does not guarantee recognition equity. The findings highlight the need for explicit strategies to ensure visibility and acknowledgment of women in team environments.

Although due to the small sample size (n = 4 groupings), statistical significance could not be determined, the directional evidence supports broader trends identified in prior

research and validates the use of the survey tool as an early detection mechanism for equity gaps.

7. Conclusions

The survey was designed to assess gender biases, inclusivity framework, and the impact of Sexual Assault and Sexual Harassment (SASH) policies within a project implementation framework, considering both the past experience and the present perceptions of project team members, progressively interviewed by survey, during different project events. The prior goal of the authors, as project team members of the HEALTHY SAILING Consortium (https://healthysailing.eu, accessed on 1 March 2025), further shaped into 'pilot' contributions, was to identify the eventual lack of knowledge, the possible unwanted attitudes, and defective perceptions, regarding the gender policy within the project framework, as an effective tool to improve the quality management plan, to monitor and to continuously evaluate the gender awareness of project team members, including research, training, academic staff, or professionals in different fields related to the project. Therefore, to assess the knowledge, abilities, and perceptions of team members engaged in the project tasks and activities connected to the cruise industry, the authors developed and administered a survey anonymously distributed through social media or by email, on different occasions and events. Furthermore, the key findings resulting from the survey database were aiming to contribute to project management effectiveness, to inform the project's quality management responsible staff about the status of gender policy effectiveness, facilitating the ongoing work environment analysis on this perspective, according to the legal framework, studied and mentioned by the authors in the references (i.e., listed titles from #23 to #45).

This study has several limitations that should be acknowledged. First, the sample size was relatively small (N = 66), and drawn from a specific professional context (maritime sector and related academic environments), which may limit the generalizability of the findings to other sectors or regions. Second, the KAP survey instrument, while demonstrating good internal reliability, is still in an exploratory stage and may benefit from further refinement and validation across larger and more diverse samples. Third, the study focused primarily on gender-related perceptions, without extensively addressing intersectional factors such as race, age, or socioeconomic background, which may also influence experiences of bias in project environments.

Regarding SASH policy knowledge, attitudes and practices within the project management framework, the survey results have shown a strong commitment among participants to address gender discrimination and unfairness in their work environments during project management, no matter the past experience and the practices from originated institutions and companies. Beyond the qualitative perspective of survey conclusions, the quantitative results presented above on each statement show that a large majority is willing to report incidents, with over 71.8% of women and 84.7% of men team members ready to identify gender biases, the SASH incidents, and to take action accordingly. This proactive attitude is evident among respondents with up to 1 year of professional experience, agreeing to report any discrimination. A higher percentage of 86.4% of team members is willing to take action when witnessing any gender discrimination, indicating a strong commitment to creating inclusive work environments.

The study results also suggest that early career professionals (those with <1 year of experience) demonstrated higher proactivity in responding to hypothetical discrimination scenarios. This finding supports the idea that attitudes toward gender equity may be shifting among younger professionals, presenting a strategic opportunity for intervention and culture-building in project teams. Moreover, while a majority reported positive team

dynamics, the undecided responses on critical statements (e.g., about communication effectiveness or task fairness) point to a perception vacuum, areas where clear, transparent communication and continuous training can make a substantial impact.

Apart from the quantitative dimension depicted in detail in the above analysis, the survey database analysis conducted in its four major headlines as presented in Chapter 4, may conclude to several findings on KAP parameters (Knowledge, Attitude, and Practices), synthesized as follows, proposed by the authors as monitoring remarks for quality management plan update:

a. General diversity attitude in work environment

Diversity and inclusion in the workplace, particularly in the maritime domain and connected fields, according to the project goals and objectives, are generally portrayed favorably by the responding pool of project team members and stakeholders. Although the majority indicate low levels of gender bias, harassment, and discrimination, the presence of dissidents or the recording of indecisive responses points toward the operational areas that require addressing measures. Enhancing communication, promoting diversity in problem-solving, raising awareness of harassment regulations, and guaranteeing the fairness and transparency of tasks and work allocation are a few recommended measures [12]. It is a certain fact that fixing these disparities will strengthen equity and diversity in the workplace.

b. General diversity practices in work environment

Many survey respondents have denied the existence of substantial biases during project task implementation, indicating good developments toward gender inclusion and diversity treatment fairness within the workplace interactions and professional practices along the project activities. Nonetheless, the existence of ambiguity, confirmed by undecided replies, counted for heterogeneous team members, coming from different institutions/companies, with different professional experiences and various gender-based perspectives, highlights the necessity of maintaining high attention to gender monitoring activities during project implementation. To create an environment that is inclusive, fair and equitable, the partner institutions should address these issues by promoting open communication, enhancing transparency, and guaranteeing fair treatment at all levels [14,20,25].

c. Gender equality and gender bias in project implementation

Most respondents, no matter the originated workplace in the project partner institution, disagree with the assertion that women's faults are exaggerated and, consequently, their accomplishments are ignored or undervalued. While more women concur with the claim that women are paid less for doing the same work, they also disagree with it, sharing the ambiguity of salary policy lack of transparency in the originated institutions. Although a minority believe there are disparities, the respondents also rejected the idea that male team members' behavior deters female coworkers' performance, considering that their originated place of employment and the actual project framework appointment, encourages diversity without regard to gender.

d. Sexual Assault and Sexual Harassment (SASH) policies and project procedures

According to the survey, the shared opinions of team members generally embrace compliance with the regulations regarding diversity management, equal opportunity, psychological safety, bullying, and harassment. Although, considering the past experience and the treatment in the originated partner institutions, women team members express greater confusion and discontent with these policy implementations, while men team members often have greater faith in the gender procedures. This raises the possibility of disparities in task execution, policy communication, and SASH reporting procedure effectiveness

perception, as previously identified in other professional domains [52,59,60]. High levels of indecision, especially among younger professionals, with lack of experience, may emphasize the need for more transparency, for additional training, and prior mentoring in gender policy and practices. Despite the low percentage of disagreement, organizations are urged to increase corporate trust in SASH procedures, together with a clear communication strategy, defined by clarity and transparency.

Following these punctual qualitative and quantitative conclusions, the project partner institutions are recommended to adopt the next few actions in order to improve their institutional effectiveness with a high impact regarding the project implementation framework:

- For gender policy acknowledgement, the authors recommend implementing efficient programs in mentorship, coaching or targeted training programs for diversity management, which may improve the quality of knowledge, attitudes, and perceptions, that should be required as a prerequisite for being recruited to be employed on a project implementation contract [19,26];
- For successful implementation of a project, it is highly recommended to apply prominent policies for transparency in human resources management and in remuneration aspects, to tackle the misconception of differentiated rewarding policy within the companies, in order to avoid any possible deviations [21];
- The biases and prejudices may be tackled by introducing specified gender provisions in the employment contract [60,61], and by introducing this type of knowledge in the work adjustment programs to be assimilated as part of the code of conduct, and further, as part of organizational culture [17];
- The orientation for gender policy should be targeting not mostly at male staff, but widely toward the entire staff disregarding gender, to improve the knowledge of implemented policies, and as a result, the entire staff to be symmetrically informed and acknowledged about the procedural framework—rules and regulations, misconduct consequences, reporting procedures, and monitoring rules [21].

Future research should seek to validate and refine the proposed KAP survey instrument across broader organizational contexts, including sectors beyond the maritime industry and across different cultural settings. Large-scale quantitative studies could enhance the statistical robustness of the findings and support cross-cultural comparisons, as gender dynamics are often mediated by cultural norms and organizational practices [17]. Moreover, future work could adopt longitudinal designs to examine how gender perceptions and practices evolve over time in project environments, particularly in response to targeted diversity interventions [35]. Further research could also explore the intersection of gender with other identity dimensions—such as race, ethnicity, age, disability, and socioeconomic background—using intersectional frameworks [23,62]. Finally, it would be valuable to investigate the relationship between team gender diversity and concrete project outcomes such as team performance, innovation capacity, and stakeholder satisfaction, providing more robust empirical evidence to guide diversity management practices in project governance [63,64].

In conclusion, this pilot study not only confirms previous insights into gender inequalities in project settings but also moves the field forward by proposing a tested and adaptable instrument for use in EU-funded and other project-based environments. The KAP tool provides a critical pathway for embedding gender equity into the core of project performance and governance.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The authors hereby confirm the full respect of personal data and individual rights protection and information security during the database collection in the survey procedure, in accordance with REGULATION (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 (hereinafter referred to as GDPR) and with the national legislation regarding protection and security of personal data, in force.

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Appendix A

Table A1. Survey design—KAP questionnaire tool in project quality management plan.

A1. Demographic characteristics of survey respondents							
1. Current occupation	☐ Academics—teaching staff, ☐ Researcher, ☐ Seagoing professional, ☐ Shipbuilding professional, ☐ Expert in healthy services, ☐ Port industry expert, ☐ Ship services professional, ☐ Maritime training, ☐ Authorities and government, ☐ Other						
2. Gender	male		female		other orientation	prefer not to say	
	☐		☐		☐	☐	
3. Professional experience	No experience		≤6 months	≤1 year	≤ 5 years	≤10 years	>10 years
	☐		☐	☐	☐	☐	☐
4. Professional status	Full-time contract	Part-time contract	Fixed-term contract	Self-employed	Not employed	Team member of project	
						YES	NO
	☐	☐	☐	☐	☐	☐	☐
5. Marital Status	Married ☐ Single ☐ Partnership ☐ Prefer not to say ☐						
6. Children/other care of obligations	Yes ☐ No ☐ Prefer not to say ☐						
A2. SASH policy attitudes in project management practices—presumptive attitudes and practices							
7. If I experience discrimination or unfairness of any kind in my work environment:	I keep silent	I complain to my network (friends, family, colleagues)	I complain to higher levels of management	I complain to my supervisor	I retaliate	I work harder to prove I'm better	I quit my job
	☐	☐	☐	☐	☐	☐	☐
8. If I would witness a gender discrimination during in my professional career:	I would keep silent	I would complain to my network (friends, family, colleagues)	I would complain to higher levels of management	I would complain to my supervisor	I would retaliate	I would work harder to prove I'm better	I would quit my job
	☐	☐	☐	☐	☐	☐	☐
B. KAP parameters analysis (Knowledge, Attitude and Practices)							
Please consider your experiences during the project implementation/academic activity/professional life and mark (x) the most suitable expression for you:			**Strongly disagree**	**Disagree**	**Undecided**	**Agree**	**Strongly agree**
B1. General diversity attitude in work environment							
1. My colleagues have been prejudiced against individual differences (such as gender, race or religion).			☐	☐	☐	☐	☐
2. There has been a feeling of harassment against women in my working environment.			☐	☐	☐	☐	☐

Table A1. *Cont.*

3. Individual diversity and gender balance are appreciated and promoted in solving out the problems in the daily working life.	☐	☐	☐	☐	☐
4. Different gender individuals, but with different opinions and views on various topics are considered and valued in the daily working life.	☐	☐	☐	☐	☐
5. When assigning a duty or during the tasks' allocation, gender differences are taken into consideration diminishing the female professional potential.	☐	☐	☐	☐	☐
6. The communication among the project team members is always efficient and effective, the gender diversity being properly managed.	☐	☐	☐	☐	☐
7. Female personnel's relations with the supervisors and senior staff are efficient and effective.	☐	☐	☐	☐	☐
8. Female personnel's relations with the peer staff during working life are efficient and effective.	☐	☐	☐	☐	☐
9. Female personnel's relations with the junior staff/subordinates are efficient and effective.	☐	☐	☐	☐	☐
B2. General diversity practices in work environment					
10. Male staff accepts women as equal on various tasks conducted in the professional life.	☐	☐	☐	☐	☐
11. The male counterparts perceive the female team members as a threat in competition for better positions.	☐	☐	☐	☐	☐
12. Male professionals are preferred even if the female team members have the same qualifications.	☐	☐	☐	☐	☐
13. Male professionals think that the presence of women in the project activities would limit/restrict their behaviours.	☐	☐	☐	☐	☐
14. Women in professional life are likely to experience some forms of sexual harassment.	☐	☐	☐	☐	☐
B3. Gender equality and gender bias in project implementation					
15. The successful achievements of a female team member are usually ignored or diminished.	☐	☐	☐	☐	☐
16. When a female crew member makes a mistake, the feedback and reaction are exaggerated.	☐	☐	☐	☐	☐
17. The female employees are usually paid less, even if they do the same job as men.	☐	☐	☐	☐	☐
18. I think the behaviour of male staff discourages the female staff to perform better.	☐	☐	☐	☐	☐
19. I feel the women personnel must work harder to be accepted as equal by the male counterparts.	☐	☐	☐	☐	☐
20. I feel the women personnel must work harder to be accepted as equal by their supervisors.	☐	☐	☐	☐	☐
21. The usual professional practice is to consider that a woman in a team improves relations among the team members and make the group more effective.	☐	☐	☐	☐	☐

Table A1. *Cont.*

22. Women working in a team have fewer chances to be promoted to higher positions than males, having less professional chances.	☐	☐	☐	☐	☐
23. There is an atmosphere in the work environment, where everybody can express freely his/her opinion with no prejudice in regard of gender.	☐	☐	☐	☐	☐
B4. Sexual Assault and Sexual Harassment (SASH) policies and project procedures					
24. My employer has a clear equal opportunities/mutual respect policy in place.	☐	☐	☐	☐	☐
25. There is a clear organizational procedure to claim gender issues, discrimination situations or other biases on diversity management (SASH internal policy).	☐	☐	☐	☐	☐
26. My employer has established mechanisms to report incidents on psychological safety, bulling, and harassment (SASH).	☐	☐	☐	☐	☐
27. Always my employer, takes effective actions when an incident on psychological safety, bulling and harassment (SASH) is reported.	☐	☐	☐	☐	☐
28. Optional question: if any case of gender issue you have faced (e.g., violence, discrimination, biases, prejudice or sexual assault and harassment events), throughout your career that you would like to share, please describe it briefly in the box below:					

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