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Challenges and Strategies for the Retention of Female Construction Professionals: An Empirical Study in Australia

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Abstract

The construction industry is perceived as an industry that is not viable for females to progress their careers in. Existing research studies focused on retaining senior female construction professionals are lacking. Particularly, the existing challenges and strategies found through a critical literature review were scattered and not specific to the retention of senior construction professionals. Identifying this gap, this study led to an empirical research phase to gather the firsthand experiences of 14 senior female professionals in Australia through semi-structured interviews. Subsequently, the gathered data was analysed through content analysis using NVivo software (2020). This study revealed several barriers, which were categorised into three clusters: culture in construction, disrupted career progression, and difficult working conditions. The results revealed that some barriers were consistent with the broader literature findings, while some were interesting context-specific barriers such as a lack of recognition and respect, a lack of confidence in decision-making, misalignment of childcare and construction hours, and lack of on-site feeding facilities. Similarly, the strategies were also discussed under three categories: to support females to adapt in construction, support them in their return to work from leave, and increase flexible work. Finally, recommendations were provided for individuals, organisations, and the industry to retain female employees in construction. Theoretically, this study advances understanding by identifying barriers and retention strategies specific to senior female construction professionals, framing retention as a multi-level challenge, while practically, the findings inform targeted policies to address gaps in the Australian context and improve gender equity.

Keywords: barriers; challenges; construction; female professionals; retention; solutions; strategies

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Academic Editor: Pramen P. Shrestha

Received: 7 May 2025
Revised: 13 June 2025
Accepted: 17 June 2025
Published: 23 June 2025

Citation: Senaratne, S.; Jayakodi, S.; Pascoe, R.D.; Atkins, A. Challenges and Strategies for the Retention of Female Construction Professionals: An Empirical Study in Australia. *Buildings* **2025**, *15*, 2187. https://doi.org/10.3390/buildings15132187

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1. Introduction

The construction industry is a significant economic contributor and is heavily dependent on its employees [1]. The International Labour Organisation [2] estimated that the global construction industry has provided about 7% of total global employment, which is approximately 220 million people. Although females represent 50% of the global workforce, the construction industry employs less than 10% of females over 90% of males [3,4]. Wang et al. [5] conducted a systematic literature review from 1993 to 2023, identifying barriers such as industry perception, motivation, environment, skill gaps, role models, well-being, organisational support, satisfaction, career development, family responsibilities,

and institutionalised inequality as main obstacles for females in joining and progressing in the construction sector. By these facts, Afolabi et al. [6] also revealed that these factors are perceived as anti-feminine characteristics in construction based on the study conducted, surveying 105 females in construction. The Australian construction industry is acknowledged as the third-largest industry in the country, which has forecasted a 2.4% annual growth rate through 2023 and a 10% employment growth rate [7]. According to the Australia Bureau of Statistics [8], females comprise under half of the paid workforce in Australia. However, the female participation rate in the construction industry has dropped gradually from 17% to 12.9% from 2006 to 2020 [9]. Hence, Baker, Ali, and Crawford [10] stated that, similar to other nations, the Australian construction industry is always male-dominated.

Construction professionals comprise architects, engineers, designers, consultants, estimators, and other professionals who are known as stakeholders and represent the clients, contractors, or government bodies involved throughout the lifecycle of a construction project [11]. The Department of Education, Skills and Employment [12] highlighted that the Australian construction industry is facing the challenge of widespread skill shortages in building and engineering professions and construction trades. The Australian Bureau of Statistics [8] highlighted that females account for only 16.2% of professional and management roles in the Australian construction industry. Cassells and Duncan [13] pointed out that there is no female board representation in two-thirds of Australian construction organisations. Further confirming these statistics, the National Skills Commission [14] also reported that females only comprised 7% of the 122,800 construction managers in Australia. Master Builders Australia [15] explained that the share of females in manager positions and professional positions was evidenced as 13.6% and 11.1%, respectively. According to Gorde [16], retention describes an organisation's ability to retain its employees. Numerous studies have pointed out that female construction professionals' retention rates are meagre [17,18]. Maurer, Choi, and Hur [19] highlighted that female serving supervisory roles are approximately three times more likely to leave the industry compared to their male counterparts.

This raises the question of why it is important to retain senior female construction professionals. In the context of this study, 'senior female construction professionals' refers to holding managerial or leadership roles with substantial experience (generally more than eight years of industry experience), reflecting both positional seniority and accumulated professional expertise within the Australian construction sector. Hunt, Layton, and Prince [20] show that gender-diverse companies are 15% more likely to outperform their respective industry medians. Wangle [21] found that female professionals in the construction industry are more productive and possess the ability to focus on multiple tasks. Further, females remain an untapped source who offer different perspectives on leadership, contributing alternative approaches that enhance problem-solving and innovation within the construction industry [22,23]. Male leadership is traditionally viewed as more hierarchical and directive, while female leaders tend to adopt more collaborative and inclusive approaches. This complementary difference in style can lead to higher levels of engagement and improved project results [24]. Females remain underrepresented in leadership positions, limiting the spectrum of leadership perspectives and approaches [6,25]. This evidence reveals that the representation of senior female professionals in construction is vital for fostering diverse leadership perspectives, driving inclusive decision-making, and challenging traditional gender norms in the industry. However, Zhang et al. [26] commented that retention has become a continuous issue that affects female construction professionals on a global scale. Hence, it is imperative to investigate the underlined challenges faced by senior females in construction.

Considering the current research studies on 'females in construction' in Australia, Table 1 provides an overview of the published journal articles during the last 10 years and

their focused research themes in five areas. According to Table 1, the greatest focus is on gender equity and diversity, followed by recruitment resilience and career development. Four studies have focused on the retention of females in the Australian construction industry, which further reveals a lack of studies conducted on female retention in construction in the Australian context. Zhang et al. [26] surveyed early-career females, explaining retention barriers and strategies, but overlooked mid- and senior-level female workers. Ghanbaripour et al. [27] systematically reviewed challenges and strategies without focusing on specific female categories, and lacked empirical data. Wells et al. [28] discussed attraction, retention, and career development for female graduates, but did not focus on experienced female professionals. Baker, Ali, and Crawford [10] surveyed workplace attraction and retention factors across managers, non-managers, and professionals, but lacked qualitative insights into senior professionals' retention experiences. In accordance with these findings, their study conducted a scientometric review of 128 journal articles published between 2000 and 2019 on females in construction in the global context, revealing that most research focused on gender, diversity, work–life balance, and career development [29]. However, the findings indicate limited emphasis on the specific issue of female retention in the construction industry, suggesting a need for further investigation in this area. This indicates that the issue of female retention in the construction industry is not unique to the Australian context and prevails as a research gap in the global context.

Table 1. Focus of current research studies on females in construction in Australia.

		Sources																				
	Focused Research Themes	**Galea et al. [30]**	**French and Strachan [31]**	**Francis [32]**	**Rosa et al. [33]**	**Salignac, Galea and Powell [34]**	**Bryce, Far and Gardner [35]**	**Oo, Lim and Feng [36]**	**Galea et al. [37]**	**Oo and Lim [38]**	**Wang, Messi and Sunindijo [9]**	**Baker, French and Ali [39]**	**Carnemollo and Galea [40]**	**Turner et al. [41]**	**Francis and Michielsens [1]**	**Oo, Liu and Lim [42]**	**Ghanbaripour et al. [27]**	**Baker et al. [43]**	**Holdsworth, Turner and Sanddri [44]**	**Zhang et al. [26]**	**Wells et al. [28]**	**Yan et al. [45]**
1.	Gender equity and diversity	√	√			√			√		√	√			√				√		√	
2.	Recruitment and resilience								√				√	√	√	√		√			√	
3.	Career development			√	√		√		√												√	√
4.	Retention																√	√		√	√	
5.	Other							√		√												

In addition to Table 1, the same research gap was reported in several studies, such as a lack of research in the Australian context [33] and a lack of empirical research on retention [46]; in particular, in-depth studies on the experiences of professional females in construction were lacking. This leads to the research question, "How can we mitigate the ongoing retention issue of senior female construction professionals in Australia by understanding relevant strategies to overcome their specific challenges?". Hence, this research paper aims to explore these challenges and provide suitable strategies for retaining senior female construction professionals in Australia through an empirical study. To

achieve the aim of this study, the objectives are threefold: (i) to identify the barriers faced by senior female construction professionals, (ii) to provide suitable strategies to overcome the identified barriers, and (iii) to provide recommendations to individuals, organisations, and industry to retain senior female construction professionals. This paper is structured in several sections: an abstract, an introduction, the key literature findings, the methodology, the findings and discussion, a conclusion, and references.

2. Key Literature Findings

2.1. Theories of Female Retention in Construction

The 'Glass Ceiling' theory explains the comparison of career progression between males and females in construction. This theory has been recognised as an analogy for the invisible barriers females face within the workplace [47]. Jones [48] explained that even though the workplace environment is designed for the growth of all employees irrespective of their gender, females are often disadvantaged when compared to males. Typically, faster career promotion occurs for site-based workers due to acquiring more significant responsibilities and increased project delivery exposure in construction [49]. However, females are often encouraged to take up already female-dominated career paths in construction, such as design, administration, and commercial roles in corporate offices [37]. In supporting this, the survey carried out in New South Wales (NSW), Australia, reveals that females are discouraged from taking up on-site roles due to physically demanding work in less safe environments and limited facilities [50]. The lack of on-site experience could further lead to slow career progression. Rivera et al. [51] highlight the presence of the glass ceiling theory throughout the professional development of females in the construction industry.

Another relevant theory is the 'leaky pipeline' theory. Worrall et al. [52] describe the perspective of the leaky pipeline theory as a lack of ability in females to remain in the industry after entering through education. After leaving the industry temporarily, it is becoming difficult to re-enter the industry [53]. This affects retention rates and, thereby, the female-to-male ratio of workers. Cabrera [54] explains that most females leave before they can progress further in the industry, and therefore, the leaky pipeline is the most applicable barrier. The leaks are caused by many challenges, which are discussed in the next section.

2.2. General Challenges for Female Construction Professionals

Numerous underlying causes result in high rates of female underrepresentation in the construction industry. Considering the existing literature evidence, the challenges can be separated into three main categories based on similar characteristics among the identified challenges: a masculine culture in construction, disrupted career progression, and difficult working conditions (See Figure 1).

- Masculine Culture in Construction

Navarro-Astro, Román-Onsalo, and Infante-Perea [55] concluded that culture and attitudes are the most impactful barriers among other barriers that female construction professionals face. Workplace culture comprises the underlying values, behaviours, attitudes, and beliefs that contribute to the order, function, and continuity of a work environment [56]. The culture of the construction industry has been formed to be inherently masculine. This ideology is demonstrated in many ways today, such as the belief that males are more capable of performing construction work compared to females, who find their qualifications questioned or overlooked [55]. The authors further explained that the concept of **gender stereotypes** is a significant barrier, which describes a structured belief relating to the traits, behaviour, and values assumed to be typical in males or females.

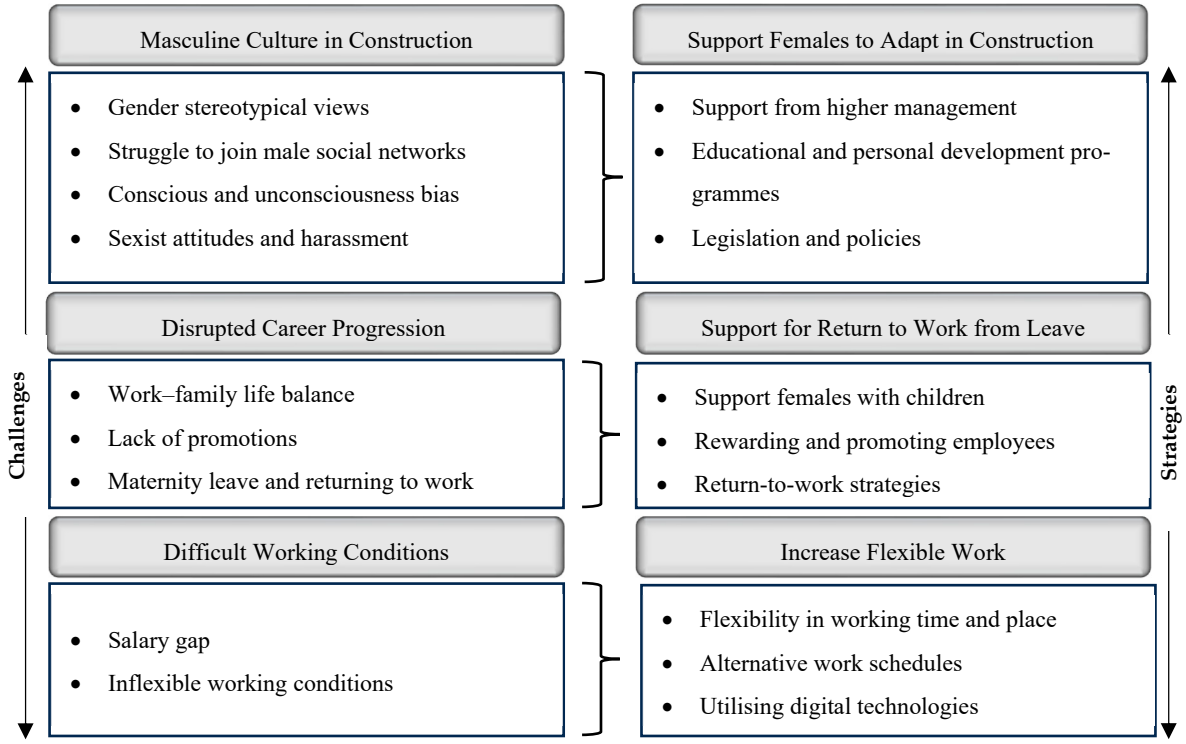


Figure 1. General challenges and strategies identified through the literature review.

Females find it difficult to integrate into a masculine workplace culture [36]. Lu and Sexton [57] reported on the career journeys of senior female managers in construction, while emphasising that females would struggle to **join existing male networks** and were often excluded from important company events. This hampers career development as networking in the industry is beneficial in forming contacts, gaining opportunities, and obtaining industry information.

Zhang et al. [26] and Hasan et al. [29] commented that females face **gender biases** and confront obstacles throughout their career journey. Preconceptions held by the organisation during the hiring process can lead to females not being given work that they desire or have studied for, putting them at a disadvantage to other male candidates. This can also occur in internal promotions and team selections for construction projects [55,58]. This is one of the reasons that the industry is not as diversified.

In addition to the embedded masculine culture of the construction industry, females tend to experience **sexist attitudes** from their male colleagues. These attitudes can occur through aggressive behaviour, a lack of cooperation, or opposition to female authority [55]. It was estimated that 51% of female workers in construction had experienced sexual harassment in the workplace [59]. Aboagye-Nimo and Wood [47] highlighted that these sexist attitudes tended to be held by older male construction workers. They also noted that their beliefs would hopefully disappear as a younger generation of workers, who see their female counterparts as equals, would replace them. Holdsworth et al. [60] have further explained that attitudes and cultural barriers most often occur in combination with each other.

In addition to this, it was evident that the **lack of female role models** in managerial positions was a barrier for young professionals. Perrenoud, Bigelow, and Perkings [3] noted that the self-perception that female construction professionals have of themselves can fluctuate due to the complicated route of career progression they experience, as mentioned before. Research shows that having **no allocated mentor** in the workplace dramatically impacts female career progression [61]. The success of formal mentoring programmes is

due in large part to the commitment and dedication of the coordinator, who matches the mentors with the mentees and ensures that the programme meets the mentees' needs.

- Disrupted Career Progression

Work–family life balance can also affect the pathway of career progression. Most of the research studies explained that a work–family life balance is expected from females, which is acknowledged as extremely difficult and challenging to obtain [26,38,62]. Due to the societal assumed obligation for females to be primarily responsible for raising and taking care of their families, a disruption to the work–family life balance is mainly exclusive to females and is an outcome of the strenuous requirements placed on construction workers through long working days [55,58]. Holdsworth et al. [60] insisted that the decline in work–family balance induces pressure and stress on workers and ultimately harms their well-being. The authors have further explained that this is a critical reason that females choose not to remain in the industry: not only to dedicate more time to their families, but also to protect their mental well-being.

Aboagye-Nimo, Wood, and Collison [47] emphasised that females with over 20 years of experience in the industry had previously faced immense challenges in taking maternity leave. For example, they opted to take annual leave instead of maternity leave to show their employer they would not be absent from work for an extended period and were finding it **difficult to return after maternity leave,** as companies would not allow for more flexible work hours. Due to the absence from work for parental leave and less availability to work long days, females will become more **overlooked for promotions** or even be given fewer choices in work roles [35]. Francis [32] highlighted that the perception of motherhood is often viewed negatively. According to Baker, French, and Ali [39], project-based construction organisations in the Australian construction industry have a sceptical attitude toward the credibility, openness, and fairness of promotions and internal appointments, which is mostly based on gender bias and informal selection. This suggests that returning to work after maternity leave negatively impacts the influx of young females studying construction and entering the industry, while preventing exiting female industry professionals from continuing their careers in construction.

- Difficult Working Conditions

The Australian construction industry is ranked the fifth highest industry in terms of the **pay gap** between males and females, with females earning 17.4% less than their male counterparts in 2021 [63]. The organisation further noted that this percentage has fluctuated over the previous years and is not consistently narrowing the gap. Factors that lead to this large pay gap include wage structures, family responsibilities, discrimination, and discretionary payments [64,65]. Expanding on this, the pay gap exists in the construction industry due to the lack of females in higher-paying roles, which, as discussed previously, is caused by a lack of promotions and the time female construction professionals may need to take parental leave.

It has been identified that the demanding workload in the construction industry leads to job pressure and insufficient personal time, which will ultimately result in poor work–family life balance in female construction professionals [38,66] as discussed above. **Inflexible working conditions** with unrealistic expectations within organisations and heavy workloads are highly discussed as deterrents for females entering and remaining in the construction industry [33,67]. It is evident that both male and female construction professionals prefer short working hours [33,66].

2.3. General Strategies to Retain Female Construction Professionals

The strategies discussed in this section fall under three categories: support for females to adapt in construction, support for their return to work from leave, and increased flexible work (see Figure 1).

- Support Females to adapt in Construction

Recommendations outlined by Holdsworth et al. [60] focused on removing stressors in the workplace, such as inappropriate behaviour aimed towards females in construction, with the introduction of an integrated 'system-wide saturation' for the complete removal of poor behaviour. The three critical interventions needed to achieve this included unanimous **support from higher management** and board members, targeted change in the whole construction industry ecosystem, and the monitoring, reporting, and auditing of workplaces. Researchers have explained that higher management in an organisation is required to play a crucial role in creating a gender discrimination-free workplace culture which promotes equitable worker practices [32,68,69]. Confirming this, Salignac, Galea, and Powell [34] also stated that higher management should discuss and promote gender equality within the organisation.

Bridges et al. [68] also argued that organisations are required to organise **education programmes**, which encourage workplace bullying and harassment-free environments for females. If female construction professionals are to be retained in the construction industry, construction organisations should reconsider their workplace culture and inflexible work practices and organise more **personal development programmes** [26,33,70]. Additionally, it can organise **mentorship programmes** [17,69]. Further, the authors proposed establishing **female construction clubs** which support both the professional and social needs of females.

Despite numerous efforts being taken to increase awareness about female underrepresentation in the construction industry, the contribution of the construction industry in implementing gender equity **legislation and policies** still shows a noticeable gap [31,69,70]. Galea et al. [37] also explained that policies for females in construction should be more adaptable and robust. The Australian government has paid extra attention to this matter by allocating government funds to establish support systems and conduct various programmes in order to increase female participation in the construction industry. A few examples of this are the AUS 2.5 million invested in supporting females in the industry through partnerships with Master Builders Australia, the AUS 1.6 million invested in the Women's Economic Security Statement for the expansion of the Women Building Australia programme, and government grants awarded to 60 organisations under the Women's Leadership and Development Program [71]. Further, the Victorian Government's Building Equality Policy can be seen as a step forward, which promotes change through the supply chain and encourages the inclusion of females in construction. However, considering policy development and the attraction and retention of female construction professionals, Australia is required to pay more attention to these matters in every state.

- Support for Return to Work from Leave

Schmidt [72] suggested that organisations in the construction industry should **support females with children** in various ways and increase flexibility in the workplace and working time options, such as flexible work arrangements, nannies, or institutional care. Baker and French [73] suggested that investment in work–family life balance will positively impact female attraction and retention in the construction industry and increase the performance of the organisation. Bryce, Far, and Gardner [35] further highlighted the importance of the creation of **return-to-work strategies** for females in construction. **Rewarding and promoting employees** based on their target completion is also a successful strategy for employee retention and production increment [74]. Perrenoud, Bigelow, and

Perkins [3] highlighted that **recognition** in the workplace should centre the recognition of females' contribution rather than monetary recognition. The authors further highlighted that although this strategy seems inefficient in the early stage, it will have an impact on employee motivation in the long run [74].

- Increase Flexible Work

Bryce, Far, and Gardner [35] offered several recommendations on work flexibility that are beneficial for the retention of female construction professionals. These include **flexibility in working time and place,** such as part-time work, starting and finishing early, 10 working hours per day, and a hybrid working option [75]. Further, the authors emphasised three main reasons for females' preference to work from home: reduced commuting time, avoiding crowded public transport, and better work–life balance. Other researchers also highlighted the significance of **alternative work schedules,** such as compressed weeks and work flexibility, which improve the work–family life balance of females in construction [74,76]. To improve workplace flexibility, it is suggested that females to **utilise digital technologies**, and females can remotely supervise and control construction sites [9,75]. Recent advancements in AI-driven safety analysis offer effective tools to minimise construction site accidents that often disproportionately affect females on construction sites [77]. Ghanbaripour et al. [27] also explained that companies should consider **work-from-home options** to reduce long working hours.

The above review shows several challenges and strategies in the retention of female construction professionals. From male-dominant cultures to inflexible working conditions, it is understood how these challenges can impact retention in the construction industry. Overcoming these issues requires support from all levels of the industry as well as government. The current remedies suggested through various studies worldwide are still in the early stages and are generic. Therefore, consideration must be given to identifying more specific challenges and strategies through the firsthand experiences of the relevant female construction professionals.

The identified challenges through the literature review are shown in Figure 1, along with suitable strategies to overcome the identified challenges.

3. Research Method

According to Creswell [78], the choice of research approach is based on relevance to the type of research problem discussed. This study aims to identify the challenges to and appropriate strategies for addressing these challenges in order to ensure the retention of senior female construction professionals in Australia. The nature of the data required for this study is qualitative, which provides robust insights into the real-life context and preserves the intended meaning. Navarro-Astor, Román-Onsalo, and Infante-Perea [55] describe how qualitative research can allow for vivid exploration into participants' experiences, which allows us to formulate new understandings and gain knowledge of the world around us. Silverman [79] elaborated that qualitative research can entail specific data-generation methods such as semi-structured and in-depth interviews, observational methods, and focus groups. The semi-structured in-depth interview method was chosen for this study as it would facilitate obtaining the firsthand experiences of female construction professionals. According to Bernard [80], there is growing support that 10–20 key research participants are sufficient to uncover and understand the major issues in studies of lived experience. Similarly, Creswell [78] recommends conducting between 5 and 25 interviews for a phenomenological study.

In this study, 14 senior female construction professionals, who were currently working in the Australian construction industry, were selected for semi-structured interviews. The researcher secured the requisite research ethics approvals prior to conducting the inter-

views. To minimise potential risks to the interview participants, the researchers ensured the appropriate recruitment of respondents and facilitated the collection of de-identified data by following the approved ethical protocols. A purposive sampling technique was employed in order to increase the depth of understanding [81]. The respondent recruitment criteria comprised the following: females who have worked in the construction industry for at least eight (08) years; females in professional construction roles, i.e., architects, contracts administrators, design managers, estimators, or project engineers; and females in a managerial or senior construction role in either the contracting or consulting sector covering different regions in Australia (see Section 4.1 and Table 2 for further details). This ensured diverse experiences were captured across roles, sectors, and regions.

Table 2. Profiles of the interview respondents.

Respondent ID	Experience	Current Career Role	Previous Career Roles
R1	20 years	State design manager	- Architect - Design manager
R2	28 years	Construction manager	- Contracts administrator - Senior project manager
R3	15 years	Service manager	- Mechanical engineer - Design manager
R4	31 years	National sector lead for architect	- Senior project architect - Graduate architect
R5	09 years	Senior project engineer	- Site engineer - Project engineer
R6	23 years	Project manager	- Site engineer - Senior project engineer
R7	15 years	Chief financial officer	- Finance graduate - Finance manager
R8	14 years	Partner at a consulting firm	- Project manager (Contractor) - Project manager (Client) - New business and tender manager
R9	15 years	Partner at a consulting firm	- Senior building surveyor - Building surveyor
R10	16 years	Project manager	- Design engineer - Project engineer - Site engineer
R11	09 years	Site engineer	- Cadet engineer - Graduate engineer
R12	15 years	Contract administrator	- Cadet contract administrator - Contract administrator

Table 2. *Cont.*

Respondent ID	Experience	Current Career Role	Previous Career Roles
R13	08 years	Safety officer	- Safety advisor - Safety officer
R14	27 years	Project manager	- Contract administrator - Site engineer - Senior project engineer - Project manager

A series of questions was formed to focus most effectively on the aim of this research, and the questions included the challenges that the participant had experienced in their career, the strategies they had implemented in trying to improve retention in the industry, and the strategies they believed could be implemented to better the retention trend. Interviews were conducted using a flexible format that allowed for follow-up questions based on participant responses, consistent with a semi-structured approach. The final step involved transcribing the audio recordings of the interviews, with the participant's consent, to facilitate the review and allow for potential corrections. Figure 2 depicts a summary of the research process of this study.

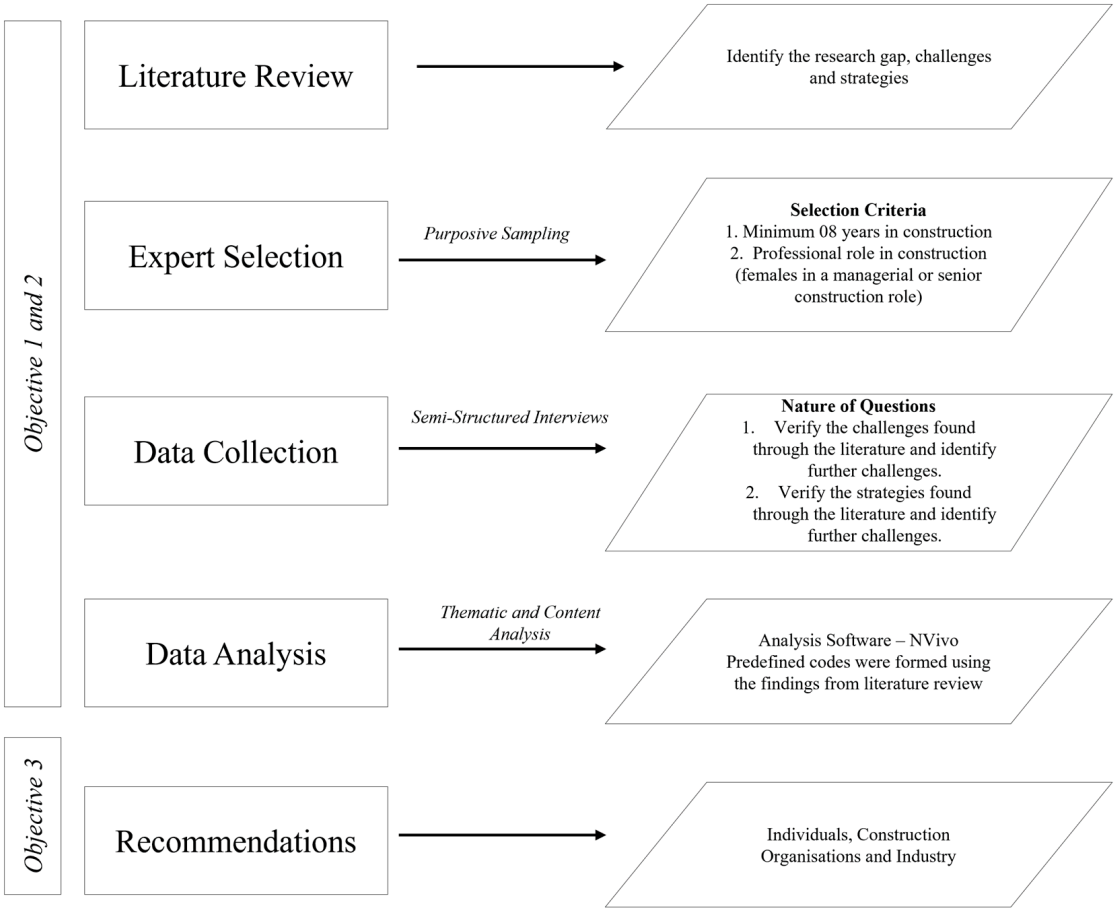


Figure 2. Summary of the research process.

Thematic analysis was then applied to the transcriptions, ensuring a thorough examination of the collected data after approval from participants. Promoting a collaborative research culture and embracing innovative approaches to qualitative data analysis, tools

like NVivo can significantly enhance the development of qualitative research methodologies [82]. Thus, NVivo software was used as it allows the user to group important themes using coding, annotate sections of importance, and compare one set of collected data with another. Figure 3 depicts the identified codes for this study.

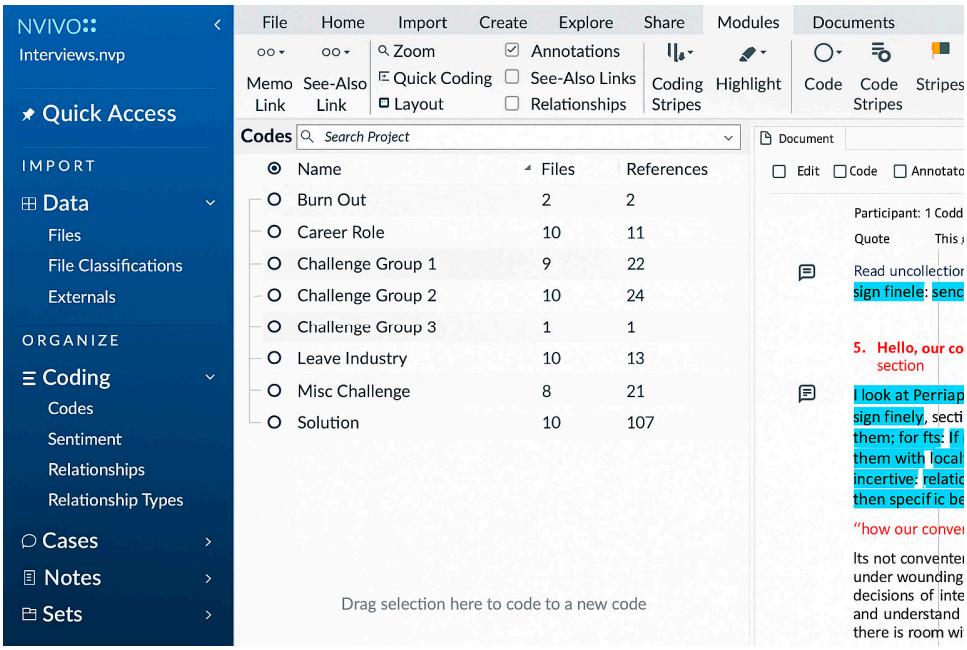


Figure 3. An example of software-facilitated coding was used for this study.

Challenges mentioned by respondents were coded under predefined categories, while strategies for retention, both already used and additionally proposed by participants, were similarly coded under the predefined categories. The coding process started with the use of predefined codes that were derived from the literature review and expanded to open coding, where new findings arose from the interview data. Annotations were also a helpful feature within the software that allowed for points of interest within the transcripts to be commented on when they could not necessarily be categorised with a code. To ensure data reliability and avoid potential researcher bias, the semi-structured interviews were guided by the same interview guideline. Further, to enhance transparency and trustworthiness, this study applied the predefined codes consistently across all transcripts, where appropriate, to maintain analytical consistency during the data analysis.

4. Empirical Findings and Discussion

This section presents the findings from the semi-structured interviews to gain an overall view of the challenges currently affecting female construction professionals within the Australian construction industry. Further, this section compares the main challenge areas and strategies identified through the literature findings with the findings of semi-structured interviews.

4.1. Respondents' Details

Fourteen (14) female construction professionals were interviewed as part of the research for this study. Table 2 includes the details of the respondents, noting that each participant meets the criteria set prior. This gauges the range of respondents in this study regarding career roles and years of experience. Most respondents had progressed into senior or managerial positions, some of which followed the typical career path of starting as a cadet and working through site engineering, contract administrator, and design manager

roles to reach project manager or construction manager positions. Other respondents chose to move to the consultancy side of the industry or begin their careers there. The trends of retention found from the interviews were that of the fourteen participants, seven (7) had never considered leaving the industry, five (5) did consider leaving their workplaces at one time but stayed in the industry, one (1) left their workplace to move into property development, and one (1) left the industry entirely for ten years before returning. It must be noted again that these interviews were conducted with current female construction professionals, and therefore, the trends displayed only represent this specific group.

4.2. Specific Challenges Faced by Female Construction Professionals

Understanding the challenges female construction professionals experience within the industry is critical in developing strategies to target these areas. The prior knowledge gained through the literature review shaped the questions asked in the semi-structured interviews. To assist in pattern-matching, challenges were sorted into the same groups identified through the literature review and coded under similar themes, and are discussed below.

- Masculine Culture in Construction

The respondents, in general, agreed with the culture-related barriers found in the literature findings and offered further real-life instances to support them. There were multiple cases of the respondents struggling with work due to colleagues, clients, or contractors **showing no recognition** for them. For instance, workers **refuse** to take instructions from **females in authoritative positions**, or clients unconsciously prefer to deal with male construction professionals. For example, R1 explained, "*Unfortunately, the gender of the person who delivers an instruction or message matters, and it is the industry's current environment. Most of the male employees resist to follow the instructions from the female professionals*". Further, R8 shared her experience as follows: "*when I was working as a project manager in my previous role, there was a subcontractor who resisted to deal with me as I am a female, and my site manager had to put him into place telling him that I was the person responsible for this area, so he had to work with me finally*". R11 commented that "*one of my work colleagues told me that she has experienced* ***some bias/discrimination*** *when she was told on the work site that she wasn't allowed to wear shorts on site. However, her male colleagues were allowed. Further, she said she was strongly advised not to and that it wouldn't be seen as professional by her manager*". This response aligns with the challenges identified in the literature, for example, on the deeply rooted gender stereotypes that associate authority and competence with masculinity [55]. Further, these actions can come from both conscious and unconscious bias, where people may not even realise they treat females in authority differently.

Further, a **lack of respect**, a **lack of confidence in females,** and a **lack of females on site** were raised by a few respondents as significant challenges. For example, R2 also shared a similar experience to R8 on the lack of respect from subcontractors for female construction professionals when communicating with them. R14 shared on lack of confidence, stating that "*I have seen some of my female professional work colleagues lack confidence in decision-making. I think the organisational culture is also one of the contributors to this. If there is a male-dominant culture in the organisation, females hesitate to make impactful decisions in the organisation.*" This reveals the importance of tailored leadership development in female professionals and creating an organisational culture that motivates and accepts decisions taken by females. R3 shared her ideas regarding the lack of females on construction sites, stating that "*in some construction projects, I was the only female on the construction site. Sometimes, I faced difficulties in these situations in joining the male networks, and I felt alone as there was no one to talk to comfortably.*" This is in line with some of the insights shared in the NSW Women in Construction Report [50]. The report also noted that females felt like outsiders, not only

within organisations, but also due to the low representation of females in construction-related degrees or courses.

- Disrupted career progression

Respondents agreed that a balance of work–family life and returning to work in motherhood are significant barriers to staying in the industry. These have the potential to result in career burnout, as experienced by some of the construction professionals interviewed. The mentally taxing aspects of the job, coupled with the responsibilities of parenting or navigating the industry's gender-related culture as discussed above, can contribute to such **burnout**.

According to the respondents, the majority of female construction professionals in the industry are mothers or are planning on having children in the future. It was expressed that going on parental leave and not being able to return to work at total capacity would often lead to **career progression slowing down**. A respondent emphasised that her career progressing from a project manager to a senior role took her **longer than others**, as people did not want a senior project manager who had children. Other respondents also raised concerns over the issue of a stagnating career when having children. R3 expressed, "*I believe you should be promoted based on merit, not gender. But females, when having kids, will likely take a step back from their careers*". R10 explained **not being able to return to work at total capacity** further by stating, "*I was working as a design engineer in my previous organisation. After I had my second baby, I left the company due to the high workload and ended up as a freelancer doing design for different organisations. I was doing a lot of it from home, and it was flexible. After one year of my child, it was challenging coming back to work*". R3 also shared similar ideas: "*I took parental leave twice, 1st I took 10 months off and 2nd I took 9 months off. During that time, the only people I talked to were my family and the other mothers with kids. Going back to work was a lot harder cause I felt like my brain was slower; it took about 3 months to get used to things again. I had to get used to a new routine because I had to go to work and then go to day-care to pick the kids up, so the routine had changed for the whole family*.".

These responses reflect the dynamics described in the **leaky pipeline theory**, where females gradually exit or slow their career progression due to structural barriers, such as managing family responsibilities. It also relates to the **glass ceiling theory**, which highlights the invisible barriers that prevent females from advancing to senior positions, despite having the required qualifications and experience. The perception that motherhood necessitates stepping back reinforces these barriers, limiting promotion opportunities for females in construction.

Hence, childcare is an added responsibility of professional mothers. The catalysts for this challenge come from the long working hours and locations of project sites that are hard to coordinate with picking kids up from school, especially when female construction professionals have massive responsibilities within the project. These requirements can lead to investing in childcare methods, such as paying for after-school care or a nanny, which creates a financial challenge. R10 commented, "*The biggest challenge faced by females who have kids while working in construction is balancing and juggling their responsibilities. I think construction hours and childcare hours are vastly misaligned. Usually, childcare facilities are open from 8 am to 3 pm if it's school or 6 pm at best. Sometimes, I have to travel to regional sites, where I have to leave at 4 a.m. from home and work until late at night. Sometimes I reach home at 10 pm. Therefore, it is a real challenge to juggle construction hours, physical hours, and having kids*". Additionally, R8 commented, "*In my case, it is probably exacerbated by being a single mum and not having two parents to handle kids*". In support of this, the study conducted by Hong et al. [83] provides valuable empirical insights into how disproportionate family time allocation, particularly when females are both employed full-time and responsible for the majority of domestic duties, significantly reduces their subjective well-being. Educated

females benefit more from equitable household arrangements, highlighting the need for both organisational and societal support, not just workplace flexibility, to effectively address work–family conflict and improve retention in the industry.

As **childcare fees and misalignment of hours** can also be considerable challenges, a **lack of necessary on-site feeding facilities** for new mothers was also identified by one respondent. R2 commented, "*I went on leave when my 2nd child was born and came back to a full-time role when she was 5 months. The difficulties I had when coming back were when I was breastfeeding; there was no breastfeeding room*". However, one respondent had chosen not to have children, as they were more career-focused, noting that they believed that having a baby would not progress a career in construction as quickly. This leads to wider societal problems that should be addressed by the responsible parties. Society as a whole is responsible for supporting the raising of healthy kids in educated families, who will eventually add value to society. The aforementioned challenges reflect the deeply embedded gendered assumptions within organisational structures, as discussed in gendered theory in the organisational context [84]. These challenges explain that the design of work environments and systems continues to neglect the needs of females, particularly those related to caregiving. As the theory suggests, such exclusions are not incidental but are part of a broader organisational logic that historically prioritises disembodied, male-centric models of work.

- Difficult Working Conditions

All the respondents agreed on the identified challenges from the literature on difficult working conditions. The rate of career progression differing between males and females was expressed as a reason that there is a pay gap in the industry, as while a female and a male may have the same number of years within the industry, the latter would likely not have to take **a long period of parental leave**. R3 commented, "*Payment issues are across both genders, but in general, females do get paid a bit less. Females are having kids, and when you go on parental leave, your career stagnates, and that's what happened to me. That is why your pay would be less than someone with the same years of experience who hasn't gone through that*".

One respondent exemplified this by describing the **demanding work hours**, **lengthy travel commitments**, and additional challenge of being a single mother to young children, which left her with no free time and inadequate sleep. The study conducted by Greenhaus et al. [85] related to behavioural research on the work–career conflicts of career couples explains that time-based work–family conflict is particularly high for females in construction due to long work hours and frequent travel. Studies show that having autonomy, such as control over work schedules, can help females reduce this conflict by allowing for more flexibility in managing their tasks. However, the construction industry often offers limited flexibility, which makes it harder for females to overcome these challenges and therefore leads to career disruption.

The above-identified challenges from the interviews are depicted in Figure 4, along with the strategies identified through the interviews, which are explained in the next section.

4.3. Specific Strategies to Retain Female Construction Professionals

During the interviews, there were various responses when asking the construction professionals about strategies they had seen, or thought could be implemented, in the industry. Based on the answers of the respondents and considering the themes of the challenges, the strategies were divided into three major categories: support for females to adapt in construction; support for their return to work from leave; and increases in flexible work, as illustrated in Figure 4.

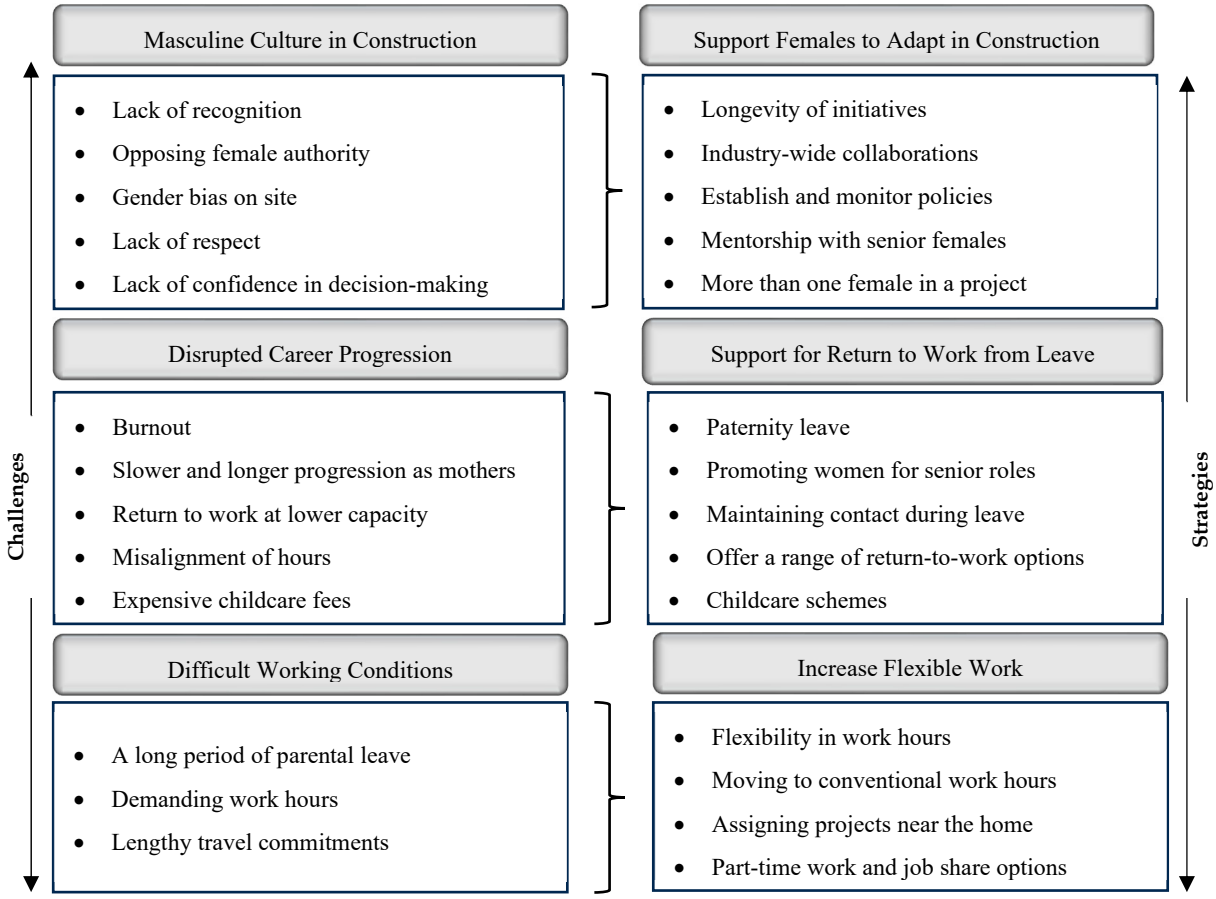


Figure 4. Specific challenges and strategies identified through interviews.

- Support females to Adapt in Construction

The respondents also highlighted that the retention strategies found in the literature, such as support from higher management and educational/personal development programmes and policies, are crucial. There were two significant points made with regard to driving change in the industry for female retention in construction. The first was about the **duration of the initiatives,** with a need for multiple challenges to be targeted by setting higher objectives. The second point regarded the **collaboration of the whole delivery chain** in the industry, from the clients to the contractors and suppliers. By encouraging and promoting initiatives for females in construction in all areas, the current perspective of the industry will change. R14 proposed that "*clients, both public and private, need to drive the change, illustrating that a strategy could be enforcing gender targets on the tenders, as this will force the builders to not only bring more females into the industry but keep them in as well. For instance, a larger project can demand gender diversity targets; if a 1-billion-dollar project is at tender and the client requires 50% of female technical staff, companies within the industry will make urgent changes to meet this demand.*" R14 further commented that these recommendations require further investigation into how this could be implemented and precisely what outcomes will be achieved. Most of the respondents accepted the fact that as an organisation, the government also have a significant contribution to female retention in the construction industry. However, R7 commented, "*Even though the government has imposed several policies, organisations should properly* ***establish and monitor such policies***".

Multiple respondents mentioned the need for **mentorship programmes**. As a young female, having someone to look up to in the industry does help in retention, as they can see that there is a way to reach senior and managerial roles. In particular, **working together with senior female construction professionals** would be beneficial for young

female construction professionals. For example, R13 commented, "*the main ways to support females in the industry include using a mentorship program in which a senior female would mentor a junior female, allowing them to share advice and experiences and be role models*". Some of the respondents commented on having **more than one female in a construction project**. In conjunction with this, **creating social networks** through initiatives such as female in construction groups within the company was noted multiple times as a practical solution, especially when males are included in the conversation.

- Support for Return to Work from Leave

The literature highlights the need for strategies to support females with children who return to work after leave, which is also confirmed by respondents. One of the main points in retaining female construction professionals revolved around support for mothers. According to the respondents, parental leave is a decisive factor when choosing a workplace, with significant emphasis on communicating with the employer about what works best for the employee. A range of strategies were given during the interviews, from organisations offering 18-week parental leave to allowing the father to take the leave so the mother can return to work sooner. R11 commented, "***Paternity leave*** *is a good option that companies are providing for parents who can schedule their work–family life accordingly*". Additionally, **promoting females into senior roles** has been highlighted by the majority of the respondents. R14 shared the experience that "*I have heard from friends of mine in other sectors that have been promoted while on maternity leave; however, in construction, I have rarely experienced this*".

Maintaining contact with workers on parental leave was also a point brought up. This allowed the worker to not feel as secluded from the organisation while away and to plan their return to work. As respondents suggested, the most effective way to use return-to-work policies is by communicating with the worker about what best suits them among **different options**, such as job-sharing, part-time work, temporary role change, and discussing the career pathway to ensure that progression is not affected.

Other strategies the organisation could use include incorporating a **childcare scheme**, such as pre-tax salary sacrifice, childcare payment help, or reimbursement plans for children under five, in order to address the challenge of childcare fees. This solution is aimed at helping female construction professionals who are also not in senior roles, where the fees of childcare or hiring nannies may have a more significant impact on their salaries. R13 elaborated, "*establishing feeding rooms for mothers and their babies and a childcare centre close to will help professional mothers to balance their work life without interrupting their daily routine*". R2 also confirmed, "*I think it is really good now that people are talking about having* ***feeding facilities*** *in construction organisations. I think this will be beneficial for more construction females*". These support methods for mothers returning to work create a workplace that not only improves the retention of females but is also desirable to be part of.

- Increase Flexible Work

The literature highlighted that flexibility of working time and workplace, digital technologies, and employee rewards and promotions are appropriate retention strategies. Half of the respondents shared that removing long working and travel hours, allowing people to work from home, is a beneficial solution in helping retain female construction professionals because it allows mothers to stay home and look after their kids. However, R1 commented that the "*adoption of digital technologies in construction is still at the adolescence stage*". **Allowing parents to start later or finish earlier** than construction hours so they can align their work with school hours is also a benefit of workplace flexibility. It must also be noted that the respondents agreed that it is their responsibility to meet deadlines and maintain productivity. Other strategies that were mentioned were construction, **moving**

towards more conventional work hours, and **allocating workers to projects closer to home**. In addition to that, some respondents emphasised a desire for **part-time and shared work**. A step further to this is **the 9-day fortnight**, which had been implemented in the workplace of one of the participants and was not found to cause a decrease in productivity.

Figure 4 depicts the summary of the identified specific challenges and strategies through the interviews.

5. Recommendations Emerging from the Research Findings

The literature review revealed generic challenges and strategies that females face within the construction industry. While the interview questions were structured around these literature findings, it was interesting to discover new challenges and strategies that were specific to the respondents' experiences and the context studied. Table 3 compares the literature findings with interview findings (Figures 1 and 4).

Table 3. Comparison of literature review and interview outcome.

Challenges	
Literature Findings	Interview Findings
Masculine Culture in Construction	
Gender stereotypical views	Lack of recognition
Struggle to join male social networks	Opposing female authority
Conscious and unconscious biases towards females	Gender bias on site
Sexist attitudes and harassment	Lack of respect
Lack of role models and mentors	Lack of confidence in decision-making
	Lack of females on site
Disrupted Career Progression	
Work–family life balance	Burnout
Lack of promotions	Slower and longer progression as mothers
Taking maternity leave and returning to work	Return to work at lower capacity
	Misalignment of hours
	High childcare fees
	Lack of on-site feeding facilities
Difficult Working Conditions	
Salary gap	A long period of parental leave
Inflexible work conditions	Demanding work hours
	Lengthy travel commitments
Strategies	
Literature Findings	Interview Findings
Support Females to Adapt in Construction	
Support from higher management	Duration of initiatives
Educational and personal development programmes	Industry-wide collaborations
Legislation and policies	Establish and monitor policies
Mentorship programmes	Mentorship with senior females
	More than one female in a project
	Creating female social networks
Support for Return to Work from Leave	
Support females with children	Paternity leave
Rewarding and promoting employees	Promoting females into senior roles
Return-to-work strategies	Maintaining contact during parental leave
	Offer a range of return-to-work options
	Childcare scheme
	Feeding facilities
Increase Flexible Work	
Flexibility in working time and place	Flexibility in work hours
Alternative work schedules	Moving to conventional work hours
Utilising digital technologies	Assigning projects near home
Work from home options	Part-time work and job share
	9-day fortnight shift

Building on these research findings, recommendations can be derived for several parties, such as individuals, organisations, and the industry, as mapped in Figure 5. While the construction organisations need to take most of the actions in retaining their female employees, the individual females, males, and the industry as a whole, need to do their part too. This will not only help to retain the existing female workforce, but also attract young females entering the industry as they see that there is a place for them to progress in their careers. Further, having more female construction professionals will impact on the profits and productivity of the organisations [21,86].

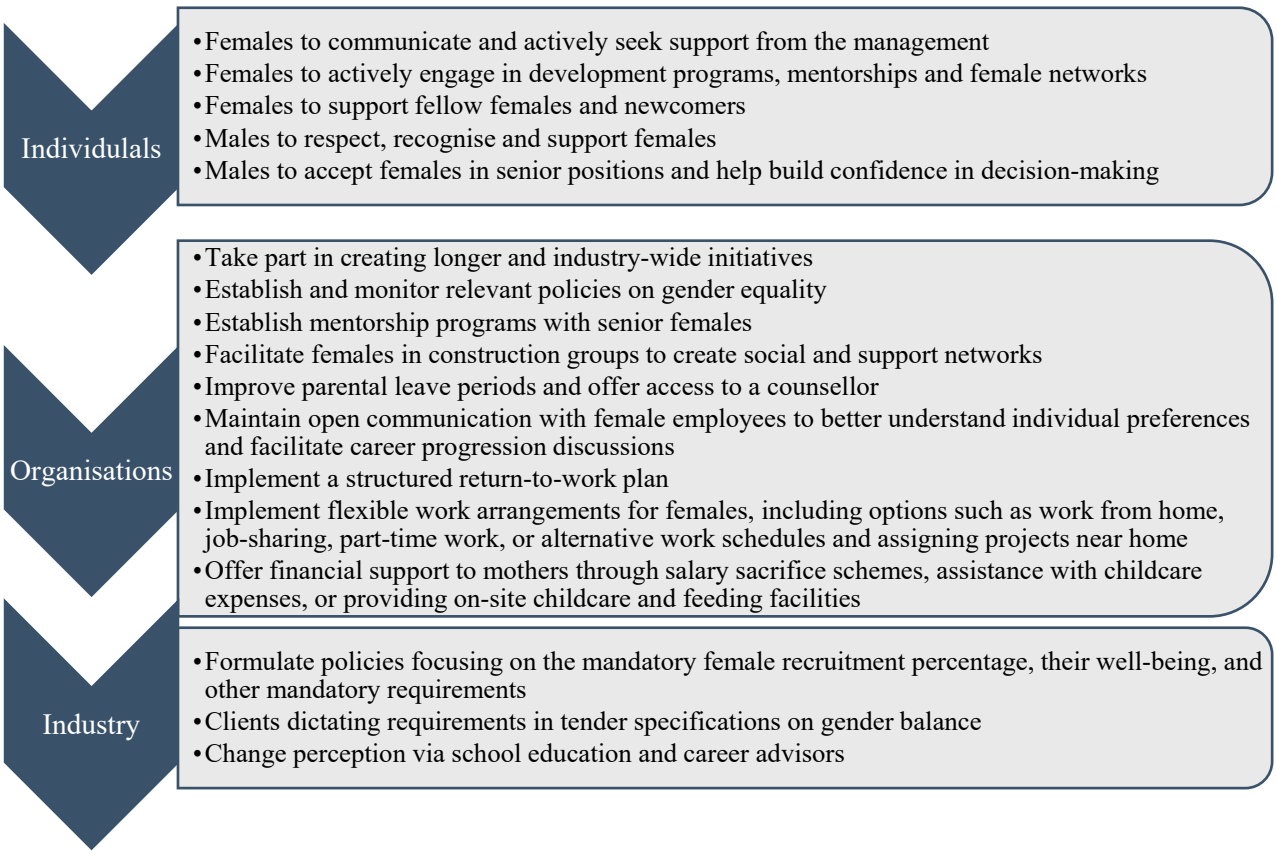


Figure 5. Recommendations for individuals, organisations, and the industry to retain females in construction.

It is imperative to evaluate organisational capabilities or feasibility when implementing the recommendations. With resources and support, the organisational structures of Tier 1 main contractor organisations are better positioned with the proposed recommendations, while other SMEs may face constraints. Hence, government incentives, industry partnerships, and access to shared resources can help build capacity for long-term implementation. Finally, the perception of construction as an unsuitable career choice for females is observed to permeate the educational system, with career advisors exhibiting gender bias in steering females towards specific professions, which needs to be addressed as well.

6. Research Implications

6.1. Theoretical Implications

This study contributes to the growing body of literature on gender in construction by specifically focusing on the retention of senior female professionals. As explained in the introduction section, a limited number of studies were carried out on female retention in construction in the Australian context. Considering the theoretical contribution,

those studies also found that there was limited empirical evidence and a lack of or no focus on the specific female category. Through the literature review, it was identified that senior female professionals bring distinctive managerial, leadership, and strategic decision-making capabilities to organisations, contributing significantly to organisational performance. Hence, their retention in the organisations is imperative. In such a context, it is essential to address the systemic barriers they face and implement targeted strategies that foster career progression and supportive workplace cultures, which are effectively addressed through this study by analysing real-life experiences. Crucially, through the literature, it was proven that, in the global context as well, female retention in construction has been an underaddressed research domain. Hence, the findings of this study can be effectively utilised in a global context based on their relevance.

6.2. Practical Implications

For construction organisations and industry stakeholders, this study identifies key barriers to retention, such as a masculine culture, disrupted career progression, and difficult work conditions. The strategies mainly identified included supporting females to adapt in construction and return to work from leave with flexible work arrangements. The majority of these strategies can be implemented at the organisational level. Hence, these findings can mainly guide human resource managers in implementing practical strategies and succession planning that supports long-term career sustainability for females. To aid this process, Section 5 offers a list of recommendations for individuals, organisations, and industry.

Additionally, the National Association of Women in Construction (NAWIC) remains steadfast in its commitment to achieving 25% female participation across all roles in the Australian construction industry by 2025. However, Master Builders Australia reported that in 2023, females represented 13.6% of the construction workforce in Australia. Further, the NSW Department of Customer Service reported that the female representation of construction has declined from 17% in 2006 to 12.9% in 2020. This slow progress underscores that the retention of female professionals is critical. In particular, to senior construction professionals, it diminishes the long-term impact of attracting other females by becoming role models. In this context, the present study is both timely and essential, as it provides targeted insights into the specific challenges that contribute to the loss of senior female talent and proposes strategies to improve retention outcomes, thereby supporting sustainable gender equity across the sector.

Moreover, this study not only aids in retaining female construction professionals but also promotes diversity and inclusion within the industry by addressing UN Sustainable Development Goal 5 on Gender Equality.

6.3. Policy Implications

This study provides evidence-based insights that can inform targeted policy interventions. While legislations such as the Sex Discrimination Act 1984 and the Workplace Gender Equality Act 2012 in Australia provide legal protections and gender reporting obligations, this study necessitates retention-focused policies that go beyond recruitment and representation. Female empowerment programmes, such as the Building Women's Careers Program, demonstrate national commitment; more specific and targeted policies are needed at the national level to retain female professionals across recruitment to the new workforce.

7. Conclusions

The construction industry has always been a fast-paced and complex environment. Improving female recruitment, treatment, and retention in the construction industry is a

continuous initiative that has progressively improved over the years. To determine the current circumstances of female construction professionals in the industry, it is essential to understand the challenges they experience and what strategies they are currently being provided. This was completed through a critical literature review and interviewing a group of senior female construction professionals in the Australian construction industry. The themes that became apparent from this study were related to flexible work with a work–life balance, parental leave and return to work policies, and support for females in the industry. It must be noted that the challenges identified through this research have some form of relation with or a catalytic effect on one another.

The ways in which the interview participants dealt with the challenges relating to these themes created a variety of recommendations that could be used by individuals or implemented by organisations. It was evident that the strategies organisations used to retain female employees varied greatly, showing that some companies performed better than others. An intriguing insight shared by a female construction professional in the interviews highlighted that a specific Australian construction company stood out as the ideal workplace for individuals planning to start a family. This distinction was attributed to extensive support, including 18 weeks of parental leave, a structured return-to-work plan ensuring suitable role placement, access to a counsellor addressing potential challenges during the return process, and conveniently located childcare facilities near the office. While this company serves as a commendable example of efforts to enhance the retention of females in construction, it is acknowledged that smaller companies may face resource constraints in replicating such comprehensive support. However, there are many strategies that all construction organisations could implement, as depicted in Figure 4 in the previous section. The critical point taken away from the research is that these initiatives require longevity and should not focus on short-term targets.

It is also essential that change is driven through the industry by the demands a client makes through the tender process, leading organisations throughout the delivery chain to make necessary improvements in recruiting and retaining females in construction. Through the research findings, it has become apparent that the industry needs to strive to do more to retain female construction professionals. Industry-wide initiatives are needed to alter the perception and working cycles of females working in construction. It was regularly mentioned throughout the interviews that the female construction professionals thoroughly enjoyed the nature of the work and often enjoyed the challenging projects and delivery aspects of construction. The issue lies in the fact that their opportunities within the industry for career progression and recognition are not equal to those of their male counterparts. Hence, it is expected that the recommendations presented in Figure 4 will address this issue, thereby positively transforming the perception of females in the industry and fostering a more equitable work environment. Furthermore, these recommendations can serve as a basis for establishing necessary rules and regulations for females in the construction industry. As limitations of this study, the authors acknowledge that the sample consists solely of senior female professionals within the Australian construction industry, which may limit the generalisability of the findings to other geographic or cultural contexts. While participants represented a range of roles, not all professional disciplines within construction were equally covered. Hence, future research should expand on acquiring the retention of senior female professionals from other countries and examine the experiences of senior females across specific construction professions and organisational types. Further, for novel study, future research directions could be in studying the leadership capabilities of senior female professionals in the construction industry, as it was revealed to be different from males.

Author Contributions: Conceptualization, R.D.P., S.S. and A.A.; methodology, S.S. and S.J.; software, R.D.P.; validation, R.D.P. and A.A.; formal analysis, A.A. and S.J.; investigation, S.S. and S.J.; data curation, R.D.P. and A.A.; writing—original draft preparation, S.S. and S.J.; writing—review and editing, S.S. and S.J.; visualization, S.S. and S.J.; supervision, S.S.; project administration, S.S.; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Human Research Ethics Committee of Western Sydney University (H15132, 1 December 2022).

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

Data Availability Statement: The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest

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