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RESEARCH ARTICLE

Challenges Faced by Women in New Zealand's Construction Industry and the Impact of Demographic Factors

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Abstract

Diversity and inclusion of the construction workforce are considered fundamental to disrupting the perception of the male-dominated construction industry. Despite efforts to increase diversity and inclusion, the construction industry continues to record a slow increase in women's representation, resulting in the industry missing significant potential talent. Therefore, identifying challenges in women's work environment is vital for promoting construction careers. This study examines three categories of challenges:

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benevolent sexism, hostile sexism, and job conditions and the influences of demographic factors. The study adopted a quantitative research method, with 65 structured questionnaires completed by women working in the New Zealand construction industry. The study found that benevolent sexism challenges, such as stereotyping and pressure to prove oneself and hostile sexism challenges, like masculine culture, sexual harassment, and lack of respect, are significant for women in construction. A lack of female role models and work overload are two job condition-related challenges that affect women in the industry. The findings from this study are an important contribution to the existing literature, as they highlight the need to consider demographic factors when creating initiatives to address the challenges faced by women in the construction industry.

Keywords

Challenges; Construction; Job Condition; Women Workforce; Sexism

Introduction

In empirical research, the New Zealand construction industry emerges as a critical focal point due to its dynamic interplay with gender-related challenges. The construction industry is a complex, multi-level, interrelated system that is traditionally male-dominated (Lingard and Turner, 2022). The enduring gender gap is officially acknowledged as a real problem (Abdel-Raouf and Buhler, 2021). As women strive for equality in traditionally male-dominated sectors, it becomes increasingly imperative to delve into the key issues affecting their experiences. Research examining gender-related challenges across work environments in diverse social, historical, and economic complexities has been conducted (Cortis, Foley and Williamson, 2022; Williams and Emerson, 2019). Research results might fall into groups based on biological, organizational, structural, cultural, or socialization models (Bowen et al., 2018; Evetts, 1998; Pollard, 2007). It is important to emphasize that the scarcity of research on women in the New Zealand construction industry (Rotimi, et al., 2022) constitutes a significant aspect that this current study will address. This paper aims to shed light on the distinct challenges faced by women in the construction industry, their implications for mental health, and the underlying factors that contribute to these issues.

The construction industry has been making efforts to increase the representation of women, but the rate of growth in the number of female workers has been slow. As a result, the industry is missing out on a significant pool of talented individuals. In the fourth quadrant of 2022, females accounted for 14.9 % of full-time employees and 19.5 % of total status in NZ employment in construction (Stats NZ, 2023). The reason for this difference is that 29.5 % of women in construction are on part-time pay (Stats NZ, 2023), which indicates that the issues of the existing gender gap in construction are broader than just the proportion between the sexes. Regardless of their pay status, working women who face mental health challenges can experience significant impacts on various aspects of their lives. This can affect work outcomes, morale, mental and physical wellbeing, the industry, work-family conflict, and the wider society (Bostock, et al., 2019; Bowen, et al., 2018).

This study employs the framework developed by Rotimi, et al. (2023), which recognizes that women's underrepresentation in male-dominated industries is linked to three key challenges: benevolent and hostile sexism and job conditions. Benevolent sexism involves seemingly positive attitudes that reinforce traditional gender roles, while hostile sexism is overtly discriminatory (Glick and Fiske, 1996). Furthermore, tough job conditions—physically demanding environments, isolation risks, and inadequate support policies—further compound their difficulties. The study aims to investigate the challenges women face in the New Zealand construction industry, specifically in benevolent sexism, hostile sexism, and job conditions. The study also seeks to establish how demographic factors may influence these challenges. The value of this paper is threefold. First, this study fills the knowledge gap in the underlying causes of women's mental health challenges in the NZ construction industry. Second, the results might indicate reasons for the persisting

gender gap in the construction industry. Third, this empirical research will have implications in identifying various means to improve women's mental health in the construction industry. Thus, the following research questions:

RQ1: What are the significant challenges that women in the New Zealand construction industry experience that could affect their mental health?
RQ2: What are the demographic factors that influence sexism and job condition-related challenges women encounter in the NZ construction industry?

Literature review

Over the last decade, employment in the NZ construction industry has remained strong. The period between 2013 and early 2016 saw a significant increase in employment growth, which coincided with a surge in net immigration rates. Although growth diminished briefly in 2018-2019, it has since bounced back (MBIE, 2022). The construction industry has witnessed robust job growth over the past two years, despite the COVID-19 pandemic, largely due to high demand for housing and a strong infrastructure project pipeline. As of the March 2022 quarter, female workers in NZ construction increased by 25,200 (making 16% of the total construction workforce) compared to 2012 figures (MBIE, 2022). Globally, the construction sector remains characterized by a significant gender disparity, with only a small percentage, around 10%, of women constituting the workforce (RLB, 2023). However, there have been several initiatives to improve numbers. An earlier study in New Zealand by Climo (2017) describes increasing awareness of the depth of female talent as a way of attracting female workers. Similarly, OneStaff (2023), a recruiting agency in New Zealand, argues for positive change and making concerted efforts to improve the industry's diversity figures. The National Association of Women in Construction (NAWIC) has played a crucial role in advocating for women's mental well-being by promoting policies and initiatives that foster a more inclusive and supportive workplace environment (NAWIC, 2024). Stats NZ (2023) reveals that only about 19.5% of the construction workforce in New Zealand is comprised of women, meaning that they are still underrepresented. This disparity prompts the current scrutiny of the unique challenges being experienced by women in construction. It is anticipated that this scrutiny could provide valuable insights into broader workplace issues that extend to the male-dominated construction industry.

Several researchers argue that the gendered cultural contradictions shape women's impediments in construction (Dainty and Lingard, 2006; Denissen and Saguy, 2014). Cockburn (1985) addresses the cultural dilemmas for women in engineering by confronting a widely accepted sense of order and meaning. The gendered cultural processes are persuasive, and women going against them experience the power of such cultural dictates. Particularly when men derive psychological, social, and economic advantages and gain from their identification with "men's work" (Epstein, 1992). Therefore, the presence of women in male-dominated industries menaces the perception of specific jobs as intrinsically masculine (Denissen and Saguy, 2014; Ness, 2012). Cockburn (2009) states that technically skilled men fear their position in the labour market might be undermined by capable women and, therefore, may prefer to exclude women from entering organizations. Cortis, Foley and Williamson (2022) argue that senior male leaders, shaping agents of organizational norms and status hierarchies, tend to defend the status quo and constrain gender equality. All these factors lead to repeatedly described covert/hidden gender discrimination in employment incorporated into organizational structures, cultures, and processes (Danby and Ciesielska, 2021; Evetts, 1998; Ridgeway, 2009; Walker, 2019).

The construction industry has been recognized for its direct contribution to mental ill-health (Boschman, et al., 2013; Chan, Nwaogu and Naslund, 2020; Gullestrup, Lequertier and Martin, 2011). Women in construction face additional gender-specific challenges that exacerbate these mental health risks, including a

male-dominated culture and prevailing gender perceptions (English and Le Jeune, 2012). Thenguzhali and Veerachamy (2015) highlight occupational health hazards specific to women, such as mental, biological, and physical risks. More recent studies have continued to explore these issues, with Longe, et al. (2019) focusing on women engineers' participation and retention and Walker (2019) attributing underrepresentation to implicit bias. Most organizations have various inequality regimes in the form of systematic disparities incorporated into the organizational structure and hierarchy (Acker, 2006). The interaction between the dimensions of diversity, such as gender, race, class, and sexuality, influences the shape and degree of inequality, which is created and maintained by organizing processes (Acker, 2006; Blackburn, Jarman and Racko, 2014; Cockburn, 1985). Additionally, workspace typology and their interiors impact inequality issues (Migliore, Rossi-Lamastra and Tagliaro, 2022). Therefore, the concept of intersectionality assists the understanding of complex challenges women face in the workplace (Shields, 2008; Thatcher, Hymer and Arwine, 2023; Wright, 2013).

Gender is a pervasive force shaping jobs and experiences (Cortis, Foley and Williamson, 2022; Dicke, et al., 2019; Jarman, Blackburn and Racko, 2012). According to Cockburn (1985), achieving equality in the workplace requires us to move away from the idea that men and women have complementary skills and instead prioritize humanistic traits over traditional masculine or feminine characteristics. However, some argue that such gender-focused ideology may have negative sociological consequences, including a war between the sexes, declining marriage, broken families, and devaluing motherhood (Case, 2011, 2019; Kuhar and Paternotte, 2017). Additionally, innate physical and biological sex differences between men and women can affect occupational health and safety risks, such as heavy lifting impacting women's fertility (Mínguez-Alarcón, et al., 2017) and musculoskeletal disorders (Ervasti, et al., 2019). As a result, there is a need for a more gender-sensitive approach supported by research on the occupational health risks faced by women in the workplace (Mariam, Olalusi and Haupt, 2020; Venugopal, et al., 2016).

Furthermore, women tend to have more responsibilities outside their paid work in the form of unpaid care and domestic work in homes and communities than men, especially as mothers (Moreira da Silva, 2019). Despite these circumstances, women continue to be stereotyped and undervalued in the workplace (Pollard, 2007). Flexible work arrangements, becoming increasingly common, affect men and women differently (Chung and van der Lippe, 2020). While flexible working hours may promote gender equality by allowing women to balance work and family needs (Singley and Hynes, 2005; Lingard and Turner, 2022), the expectation for increased responsibility for family and work can lead to conflicts and pay penalties (Fuller and Hirsh, 2019). Research on gender biases related to motherhood and childbearing examines the societal belief that women are more devoted to family and childcare than committed to work (Kurniawan, et al., 2018; Pozo-García, et al., 2020). The COVID-19 pandemic further exacerbated the already stressful demands on working mothers (Chandola, et al., 2019) by requiring them to care for their children without institutional support (Tunji-Olayeni, 2021). As care work shifted from paid to unpaid, part-time, inequalities deepened, particularly in single-parent households (Grönlund and Öun, 2022; Power, 2020).

The challenges women face in construction are distinct, depending on the working situation, position in the organization, organization type, and age (Clarke, et al., 2015; Ibáñez, 2017; Smith, 2013; Wright, 2016). Women working onsite are more exposed to the rules of the "men's world" than those working primarily in office environments (Denissen and Saguy, 2014; Ness, 2012; Wright, 2013). Additionally, there is a discrepancy between the official definition of sexual harassment and the way women in trades or working onsite perceive and label their experience (Denissen, 2010a; Denissen, 2010b). In many countries, the construction industry faces a shortage of skilled workers (Ackrill, Caven and Alaktif, 2017; Morello, Issa and Franz, 2018; Tapia, et al., 2020). Therefore, increasing the number of women in the construction industry could yield significant social and economic benefits, making it crucial to bridge the gender gap and attract and retain more female workers (Hasan, et al., 2021). However, achieving gender equality requires

workplaces to recognize and address the multifaceted factors that impact mental health and to implement systemic organizational changes accordingly (Williams and Emerson, 2019).

SPECIFIC CHALLENGES

Building upon the work of Rotimi, et al. (2022), this study embraces the same framework rooted in sexism theory to illuminate gender-based discrimination intricacies. This framework delineates discrimination as benevolent and hostile sexism or non-gender-related job conditions. It resonates with this study by revealing discriminatory patterns in the challenges women confront (Glick and Fiske, 1996). While Rotimi, et al. acknowledged bias, prejudice, privilege, entitlement, and masculinity theories, their work omits these frameworks due to their male-focused nature (West and Zimmerman, 1987; Connell, 1995; Lorber, 1996). Other forms of sexism, such as ambivalent, institutional, and internalized sexism, often intersect with and are embedded within both benevolent and hostile sexism.

Consequently, these nuanced forms are inherently considered within our broader categorization into hostile and benevolent sexism. Benevolent sexism involves traditional gender-role-based attitudes, while hostile sexism signifies overt discrimination (Glick and Fiske, 1996). These biases profoundly affect women in construction, intertwining with demanding job conditions such as physical strain and isolation (Bridges, *et al.*, 2020). Demographics like age, race, ethnicity, and socioeconomic status can exacerbate these challenges. These biases and challenges contribute to heightened stress, anxiety, and depression. This framework, rooted in Rotimi, et al.'s work, underpins the exploration of women's distinct struggles in this male-dominated field. The current study probes the mental health implications and considers the framework's applicability to New Zealand, which is shaped by unique country-specific conditions. The ensuing section delves into these concerns, followed by this research validating their existence in New Zealand's context.

BENEVOLENT SEXISM

First, adolescence marks the start of pressure on young women to pursue careers in stereotypical female industries (Dutta, 2017; Murphy and Ren, 2010). The age demographic may have an additional influence on this challenge, as young women may experience more pressure to conform to gender stereotypes and pursue careers in traditionally female-dominated industries compared to older women. Second, recruitment bias favours male applicants, perpetuated by Human Resource staff (Regis, et al., 2019; Schmitt, 2021). The ethnic and socioeconomic demographics may further increase this bias, as women from ethnic minority groups or lower socioeconomic backgrounds may face additional challenges and discrimination due to intersectional bias. Third, in the workplace, gender-based role allocation and differential treatment towards women persist (Kamardeen and Sunindijo, 2017; Morello, Issa and Franz, 2018; Ness, 2012; Sunindijo and Kamardeen, 2017). Fourth, the gender wage gap still exists, with women paid less than men for equal work or having to work harder (Afolabi, et al., 2019; Barreto, et al., 2017; Ettinger, Conroy and Barr, 2019; Hammond, et al., 2017). The gender wage gap may also vary depending on demographic factors, with women from particular racial or ethnic groups earning less than their male counterparts. Women are denied promotions for maternity leave or working part-time (Bryce, Far and Gardner, 2019; Grönlund and Öun, 2022; Worrall, et al., 2010). This is more likely to impact older women or women with children. Fewer opportunities and promotional biases confront women in the construction industry, where the glass ceiling persists (Maji and Dixit, 2020; Nyanga and Chindanya, 2020; Oo, Lim and Feng, 2020; Servon and Visser, 2011). A woman's ethnicity can compound these biases.

HOSTILE SEXISM

The construction industry is plagued with harassment of women, affecting all demographics, including sexual harassment, humiliation, and objectification (Afolabi, et al., 2019; Barreto, et al., 2017; Capaldi,

et al., 2012; Fouad, Fitzpatrick and Liu, 2011; Galea, et al., 2021; Murphy and Ren, 2010). Unfortunately, the unfavourable sexual harassment climate and lack of support discourage women from reporting such incidents (Minnotte and Pedersen, 2019; Nyanga and Chindanya, 2020). Furthermore, younger women may feel less inclined to speak up due to not wanting to 'rock the boat' in a new workplace. Organizations often fail to address inappropriate male behaviours and adopt reactive rather than preventive measures (Regis, et al., 2019; Tapia, et al., 2020). Bystanders often fail to intervene when women are harassed (Foley, et al., 2020). The industry's dominant masculine culture leads to aggression, hostility, and disrespect towards women (Hammond and Overall, 2013; Schmitt, 2021). Women are often pressured to act like men to fit in (Fouad, Fitzpatrick and Liu, 2011; Regis, et al., 2019). In addition, bullying and harassment that victimize women but are not gender-related, are also prevalent (Kamardeen and Sunindijo, 2017). Women in ethnic minorities may feel additionally victimized by hostile sexism, as they may not know whether the harassment is due to gender, ethnicity, or perhaps both.

JOB CONDITIONS

Women face numerous job condition-related challenges in construction, including low representation and a lack of female role models and support networks (Afolabi, et al., 2019; Barreto, et al., 2017; Bryce, Far and Gardner, 2019; Schmitt, 2021). Balancing career and domestic responsibilities can also be overwhelming (Galea, et al., 2021; Lekchiri and Kamm, 2020; Regis, et al., 2019; Tapia, et al., 2020; Uzoigwe, Low and Noor, 2016). Work flexibility and childcare options are limited, and construction work can be high-pressure, with long and unpredictable hours and strict deadlines (Bowen, et al., 2018; Oo, Lim and Feng, 2020; Powell, et al., 2018; Rosa, et al., 2017; Sunindijo and Kamardeen, 2017; Worrall, et al., 2010). The work is also often physically and mentally demanding, risky, and lacks adequate site safety (Afolabi, et al., 2019; Powell, et al., 2018). Although construction work conditions affect all women in the industry, increased pressure may arise for the older demographics, who are more likely to have dependents and are more likely to have physical health issues (Tunji-Olayeni, Kajimo-Shakantu and Oni, 2021). This could also be true for women in lower socioeconomic positions who lack support networks in the industry.

Demographic factors can intersect and compound to create unique challenges and barriers for women in construction, highlighting the importance of addressing issues related to gender, race, ethnicity, and socioeconomic status in pursuing greater equity and inclusion (Acker, 2006; Dainty, et al., 2004; Shrestha, 2017). Comprehending the demographic factors influencing these challenges is critical to reducing or resolving them effectively.

Methodology

The current study was conducted in New Zealand to examine three categories of challenges women face in the construction industry: benevolent sexism, hostile sexism, and job conditions. Literature sources for these three challenges are summarised in Appendix 1. These challenges were further investigated in relation to the influence of demographic factors. The review follows Rotimi, et al. (2022) with 58 concerns under three categories (26 challenges women face in the construction industry, 15 consequences of these challenges on work, and 17 wellbeing outcomes). For this study, the 26 challenges were the focus and the basis for the questionnaire survey. The questionnaire survey requires participants to address two main questions: how often do they experience the 26 challenges? How much do those challenges affect them? A questionnaire survey was selected for this study because it is cost-effective in eliciting various responses and producing reliable results easily and flexibly (Akinci and Saunders, 2015). The questionnaire survey aligns with the quantitative research approach, which lends itself to statistical analysis to provide meaningful insights and improve interpretability (Bernard, 2017). The participants (women and those who identified as such) were selected based on a minimum of one year's experience in the construction industry within the last five years.

Before administering the questionnaire to the participants, a pilot study was conducted with experienced construction women to test the questionnaire's clarity and comprehensiveness following Oppenheim's (2001) recommendations. The questionnaire had four sections, with the first section covering demographic questions. The second, third, and fourth sections included 5-point Likert scale questions on the workplace challenges for women, the consequences of these challenges, and the wellbeing outcomes, respectively. The 5-point Likert scale was adopted because of its less complexity for the respondent to correctly rank their opinion (agreement or disagreement) using the 5-point scale provided with each statement on the challenges, consequences, and wellbeing outcomes.

The study used purposive sampling to select suitable survey participants based on the maximum variation strategy. According to Teddlie and Yu (2007), purposive sampling techniques are helpful when a researcher aims to select a sample representing a broader group of cases or to compare different types of cases along a particular dimension of interest. A total of 160 construction women were purposively sampled from the total population of 27,600 women (less mining and other occupations) (MBIE, 2022), based on the selection criteria, and 96 initially agreed to participate. However, only 65 research participants responded to the survey, which adequately satisfied the minimum sample size requirements of one sample t-test and ANOVA (Analysis of Variance), the main analytical techniques applied in this study (more details are provided under Methods of analysing data). According to Skaik (2015), a minimum sample of 40 guarantees an approximate normal distribution for the data, and the one-sample t-test can then be safely applied. The minimum sample size required for applying one-way ANOVA was calculated using the online sample size calculator for ANOVA, and it was 63 for a 0.01 level of significance and the maximum number of groups 3 (the variables relationship status, age, and experience had three groups each while other variables had only two). Further, the data requirements of one-way ANOVA explained on the Minitab (2024) website were reviewed to confirm the adequacy of the sample size. As per these explanations, the sample size for each group should be at least 15 when there are 2-9 groups to compare means, and this requirement was satisfied by the sample used in the study (Tables 7, 8, and 9).

This sample was homogeneous and comprehensive to ensure the data collected was reliable and adequate (Alreck and Settle, 1995). The questionnaire was sent via email for the speed and immediacy it offers (Michaelidou and Dibb, 2006). There were three groups of respondent: 22 women working in office environments, 21 onsite professionals, and 22 working in trades. Table 1 presents the demographic information of the study participants in terms of their age, educational background, number of children, experience, and relationship status. In addition, it describes the sample based on the participants' employment-related factors, namely, employment status, position in the employment hierarchy, experience, number of people managing, experience in the NZ construction industry, and the location of work. This detailed exploration of demographic factors is vital as the main inferential analysis of sexism and job condition-related challenges of the study are based on these variables. Informed consent for this study was obtained from all participants. The study was conducted in accordance with the Auckland University of Technology Human Ethics Guidelines and approved by the Human Ethics Committee, with reference number 21/357.

According to the results from Table 1, most of the sample was young women, and more than 85% (56/65) of them were below 50. The level of education of the participants in the study was generally high. Specifically, 80% (52/65) had certificate level or above qualification, while nearly half of the women (33/65) were graduates. Two survey participants have not completed any university qualification, though entered one and studied for a few years. Most of the women in the sample were in a relationship, where 43% (28/65) were married, and approximately 29% (19/65) were de facto.

Table 1. Demographic Data.

Age	Frequency (%)	Highest education	Frequency (%)	Relationship status	Frequency (%)
30 or below	15 (23.1%)	Below high school	7 (10.8%)	Married	28 (43.1%)
31-40	21 (32.3%)	High school	5 (7.7%)	Divorced	4 (6.2%)
41-50	20 (30.8%)	Certificate/ Diploma	16 (24.6%)	Single	9 (13.8%)
51-60	9 (13.8%)	University	2 (3.1%)	De facto	19 (29.2%)
Total	65 (100%)	Bachelor's degree	20 (30.8%)	Other	5 (7.7%)
		Master's degree	11 (16.9%)	Total	65 (100%)
		Other	3 (4.6%)		
		Total	64 (98.5%)		
No. of children	**Frequency (%)**	**Employment status**	**Frequency (%)**	**Employment level**	**Frequency (%)**
0	26 (40%)	In employment	47 (72.3%)	Employee	22 (33.8%)
1	8 (12.3%)	Self-employed	18 (27.7%)	Lower-level management	14 (21.5%)
2	21 (32.3%)	Total	65 (100%)	Middle-level management	10 (15.4%)
3	6 (9.2%)			Upper-level management	10 (15.4%)
4 or more	3 (4.6)			Total	56 (86.2%)
Total	64 (98.5%)				
No. of people managing	**Frequency (%)**	**Construction experience in NZ**	**Frequency (%)**	**Location**	**Frequency (%)**
0	27 (41.5%)	1-5 years	22 (33.8%)	Auckland	31 (47.7%)
1-5	19 (29.2%)	6-10 years	18 (27.7%)	Wellington	6 (9.2%)
6-10	6 (9.2%)	11-15 years	6 (9.2%)	Christchurch	10 (15.4%)
11-15	3 (4.6%)	16-20 years	12 (18.5%)	Other	18 (27.7%)
More than 15	10 (15.4%)	21-25 years	4 (6.2%)	Total	65 (100%)
	65 (100%)	Over 25 years	3 (4.6%)		
		Total	65 (100%)		

Thirty-nine out of 65 women (60%) in the study had children, while 30 out of them had two or more kids. More than 66% (43/65) had more than five years of experience in the NZ construction industry. Eighteen out of 65 women in the sample were self-employed. About 52% (34/65) of the sampled workers were employed at the management level. However, 19 managers had less than five people to manage. It is important to note that the sexism and job condition-related factors considered in this study can be challenging for women in the construction industry holding both high- and low-level positions. Self-employed workers also get to work with others (outside people collaborating on their projects, people working under them etc.), and thus have a chance of facing the above challenges. Therefore, regardless of the position of the job, the work in the construction industry can be tough, even for women who run their own businesses. However, since our sample contained (see Tables 2 and 3) only a very few women who are self-employed and have no one to manage (7) and are working as employees (2), the findings will be mostly relevant to female employees holding various responsibilities and interacting with a lot of co-workers in construction companies based in NZ. However, the level of challenge can vary based on the people's position. Obviously, the variability of measurement variables is an important requirement for obtaining valid results in any statistical analysis.

Table 2. Employment status and employment level

		Employment Level				Total
		Employee	Lower-level management	Middle-level management	Upper-level management	
Employment Status	In employment	20	13	10	4	47
	Self-employed	2	1	0	6	9
Total		22	14	10	10	56

Table 3. Employment status and number of people managing

		People managing					Total
		0	1-5	6-10	11-15	More than 15	
Employment Status	In employment	20	11	5	2	9	47
	Self-employed	7	8	1	1	1	18
Total		27	19	6	3	10	65

In regard to the work location, the largest group of participants (48%) were based in Auckland, while approximately 9% (6/65) and 15% (10/65) were in the other two main cities in NZ, Wellington and Christchurch, respectively. A few participants did not mention their highest level of education and employment level or the number of children they had. Hence the response rates for these questions were below 100% (see Table 1, highest education - 64/65, employment level – 56/65, and number of children – 64/65).

METHODS OF ANALYSING THE DATA

Parametric statistical tests are more methodologically rigorous compared to the alternative non-parametric approaches as long as the underlying distributional assumptions are fulfilled (Faizi and Alvi , 2023).

Mean comparison tests are the main analytical method used in this study. In order to validate the use of parametric mean tests (t-test and ANOVA), the normality of data was initially tested using the histograms and coefficients of skewness values. However, this was not a compulsory requirement in this data analysis as a sample of size 65 is sufficient for the assumption of approximate normality of data (explained under Methodology). All the variables except one job-condition challenge (Lack of site safety) had skewness coefficients within -1 and +1 range, and 18 out of 26 variables had coefficients within the -0.5 and 0.5 range. These results indicated approximate normality of data. Secondly, the homogeneity of variances was examined across all the groupings considered in the tests and the values did not indicate large deviations. Since the sample was drawn without any selection bias, all the data gathered were sufficiently independent. Therefore, parametric methods were confirmed to be valid for this study.

First, one-sample t-test was applied to examine the criticality of each challenge under three main categories: benevolent sexism, hostile sexism, and job conditions. One sample t-test is a parametric statistical test for determining whether a population mean equals to a given value. This study had 10 benevolent sexism, 10 hostile sexism, and 6 job condition-related challenges. In the t-test, the mean score of each challenge was compared with the mid-point (3) of the 5–point Likert scale used to evaluate the participants' experience of the particular challenge. Although this analysis identifies the most common challenges, the other challenges are also likely to disturb the smooth work life of construction women to some extent. Therefore, the challenges were then ranked based on the magnitude of mean scores calculated to reflect the level of cruciality of each challenge.

Since the sample of this study covered women at varied levels of job conditions in their personal and work lives, it is worth studying the three types of challenges with respect to their demographic characteristics. One-way analysis of variance (ANOVA) is the most widely used statistical technique for comparing the mean of a continuous variable across groups. The 5-point Likert scale data collected on sexism and job condition-related challenges were the continuous variables for the analysis. A one-way ANOVA was performed to identify the significant demographic factors that influences the challenges encountered by women employees in the construction industry. The Least Significant Difference (LSD) post hoc test was applied to explore the mean differences found in the ANOVA.

Results

The t-test results for benevolent sexism, hostile sexism, and job condition-related challenges are presented in Tables 2, 3, and 4. According to these results, stereotyping and pressure to prove oneself are significant benevolent sexism challenges (having the mean values above the mid-level) to construction women. Masculine culture is the only hostile sexism challenge that is statistically significant. Two job condition-related challenges, namely, lack of female role models and work overload, are also significant at 0.05 level. Although the other challenges do not indicate statistical significance for being above the average scale (3), all the individual mean values are above 2. Therefore, all 26 challenges experienced by women in the construction industry are significant and cannot be overlooked. The average values imply the level of criticality of each challenge, and Tables 2-4 have been arranged in the descending order of averages. As per these results, benevolent sexism challenges are more common than the other two types. Among these concerns, the absence of gender-inclusive uniforms or protective equipment, wage disparity, and presumed incompetency are significant issues that warrant attention. Job pressure is also a significant job condition-related challenge with a sample mean above 3. According to the analysis, there are two benevolent sexism challenges (gender role differentiation and glass ceiling). As well as three hostile sexism challenges (behavioural impressions, lack of respect, and bystander behaviour) that have mean values between 2.5 and 3, and thus could be considered moderate challenges.

Table 4. Benevolent sexism challenges (One-sample t-Test)

Challenge	Mean	Standard Deviation	P-value (H_a: $\mu > 3$)
1. Pressure to prove oneself**	3.97	1.03	0.000
2. Stereotyping**	3.52	0.96	0.000
3. Uniforms or protective equipment not gender inclusive	3.03	1.41	0.430
4. Wage gap	3.00	1.3	0.500
5. Presumed incompetency	3.00	1.12	0.500
6. Gender role differentiation	2.92	1	0.231
7. Glass ceiling	2.88	1.22	0.271
8. Encouraging into stereotypical industries	2.46	1.12	0.500
9. Sexist recruitment practices	2.46	1.17	0.500
10. Promotions withheld	2.44	1.17	0.500

**The challenge is statistically significant (i.e. the average is above the mid-level, 3) at 5% level.

The other challenges are relatively low in their level of influence on female construction workers (means between 2 and 2.5). These include three benevolent challenges (encouraging into stereotyping industries, sexist recruitment practices, and promotions withheld), five hostile sexism challenges (gender harassment,

Table 5. Hostile sexism challenges (One-sample t-Test).

Challenge	Mean	Standard Deviation	P-value (H_a: $\mu > 3$)
1. Masculine culture**	3.68	0.95	0.000
2. Behavioural impressions (Women feel pressured to act like a male to 'fit in')	2.95	1.3	0.114
3. Lack of respect	2.91	1.11	0.250
4. Bystander behaviour (Witnesses to sexist behaviour do not speak out)	2.66	1.24	0.485
5. Gender harassment	2.48	1.01	0.500
6. Encouraged into stereotype	2.44	1.16	0.500
7. Harassment not related to gender	2.23	0.96	0.500
8. Employer's refusal to address sexism	2.14	1.12	0.500
9. Sexual harassment climate (Women don't know the sexual harassment complaint procedure, or don't believe it will be taken seriously)	2.13	1.10	0.500
10. Sexual harassment	2.08	0.96	0.500

**The challenge is statistically significant (i.e. the average is above the mid-level, 3) at 5% level.

harassment not related to gender, employer's refusal to address sexism, sexual harassment climate, sexual harassment), and three job condition-related challenges (unpleasant nature of work, lack of flexible work arrangements, and lack of site safety).

Table 6. Job condition-related challenges (One-sample t-Test)

Challenge	Mean	Standard Deviation	P-value (H_a: $\mu > 3$)
1. Lack of female role models**	3.78	1.23	0.000
2. Work overload**	3.56	1.05	0.000
3. Job pressure (long hours are expected, hours are unpredictable, there is excessive work)	3.13	1.16	0.197
4. Unpleasant nature of work (risky work, a competitive culture, unsanitary conditions)	2.41	1.11	0.500
5. Lack of flexible work arrangements	2.36	1.07	0.500
6. Lack of site safety	2.03	1.04	0.500

**The challenge is statistically significant (i.e. the average is above the mid-level, 3) at 5% level.

THE EFFECT OF DEMOGRAPHIC FACTORS ON THE CHALLENGES FACED BY CONSTRUCTION WOMEN

Tables 5, 6, and 7 include the one-way analysis of variance ANOVA performed to identify the demographic factors that will significantly affect the sexism and job condition-related challenges for construction women in NZ. The p-values indicate the significant influence of several factors on the challenges. The three tables also include the number of workers in each category and the LSD multiple group comparison (post hoc test) results. Some small subgroups of demographic factors presented in Table 1 were appropriately combined to ensure adequate group sample sizes required for performing the ANOVA.

Benevolent sexism challenges

According to Table 7, four benevolent sexism challenges, namely, encouraging into stereotypical industries, gender role differentiation, stereotyping, and presumed incompetency, are all affected by the level of education of the construction women. The detailed mean comparison result explains that women not having a university degree face all four of the above challenges. For this group, gender role differentiation, stereotyping, and presumed incompetency challenges are notably above the average level measured (3) in the study. Age and industry experience in NZ are the other factors influencing benevolent sexism in the construction industry (Table 7). According to the results, wage gaps and withheld promotions are significant challenges experienced by older employees. Having children can also be identified as a significant barrier to the promotion of women in the construction sector (p-value=0.045). However, the overall mean (2.44) does not classify promotions withheld as a significantly influencing challenge for construction women in NZ. As per the mean comparison result shown in Table 7, women employees with more than ten years of experience in the NZ construction industry experience significantly longer delays in their promotions. In summary, benevolent sexism challenges are the most common challenge faced by female construction workers in NZ. The demographic factors of education level, age, having children, and years of experience of workers have significant effects on benevolent sexism challenges faced.

Table 7. Benevolent sexism challenges and influencing factors

Challenge (Average score)	ANOVA p-values and LSD post hoc test results (Averages and p-values)					
	Occupational role [Employee-22; Mgt-34]	Relationship status [Married-28; De facto-19; Other-18]	Having children [No children-26; Have children-38]	Education [Graduate-31; Not a graduate-33]	Age [≤ 30-15; 31-40-21; > 40 -29]	Experience 1-5 Y – 22; 6-10 Y-18; >10Y 25]
Pressure to prove oneself (3.97)#	0.833	0.333	0.588	0.628	0.227	0.574
Stereotyping (3.52)#	0.218	0.825	0.400	0.058* *Graduate -3.29* Not a graduate -3.75**	0.504	0.359
Uniforms or protective equipment not gender inclusive (3.03)	0.874	0.786	0.394	0.720	0.876	0.782
Wage gap (3.00)	0.248	0.903	0.221	0.923	0.064* *≤ 30 – 2.33*/** 31-40 – 3.10* > 40 – 3.29***	0.264
Presumed incompetency (3.00)	0.128	0.868	0.823	0.076* *Graduate -2.74* Not a graduate -3.24**	0.416	0.855
Gender role differentiation (2.92)	0.599	0.743	0.541	0.023** *Graduate -2.65** Not a graduate-3.21***	0.916	0.994
Glass ceiling (2.88)	0.207	0.893	0.156	0.277	0.686	0.355
Encouraging into stereotypical industries (2.46)	0.225	0.851	0.691	0.058* *Graduate-2.19* Not a graduate -2.73**	0.740	0.837
Sexist recruitment practices (2.46)	0.206	0.709	0.636	0.111	0.745	0.184
Promotions withheld (2.44)	0.238	0.380	0.045** *No children -2.08** Have children -2.68***	0.558	0.020** *≤ 30 – 1.73**/†† 31-40 –2.52** > 40 – 2.75**/††*	0.018** *1-5 Y – 2.18** 6-10 Y –2.06†† >10Y –2.96**/††*

*/†The mean difference is significant at 10% level; **/††The mean difference is significant at 5% level

#The average score of the challenge is significantly larger than the mid-level (3).

Hostile sexism challenges

Table 8 presents a detailed analysis of the underlying factors of hostile sexism challenges within the construction industry. Sexual harassment, sexual harassment culture, and lack of respect are the challenges influenced significantly by the demographic factors examined. Both Sexual harassment and sexual harassment culture show a marginal significance only, and the relationship status and the occupational role (management or employee) are the factors affecting the above challenges. However, the occupational role

Table 8. Hostile sexism challenges and influencing factors.

Challenge (Average score)	ANOVA p-values and LSD post hoc test results (Averages and p-values)					
	Occupational role [Employee-22; Mgt-34]	Relationship status [Married-28; De facto-19; Other-18]	Having children [No children-26; Have children-38]	Education [Graduate-31; Not a graduate-33]	Age [≤ 30-15; 31-40-21; > 40 -29]	Experience 1-5 Y – 22; 6-10 Y-18; >10Y 25]
Masculine culture (3.68)#	0.352	0.708	0.802	0.692	0.500	0.860
Behavioural impressions (Women feel pressured to act like a male to 'fit in') (2.95)	0.297	0.277	0.939	0.502	0.494	0.961
Lack of respect (2.91)	0.028** *Employee – 2.59 Management – 3.26*	0.088* *Married – 2.71** *De facto – 2.74* *Other – 3.41**/*	0.997	0.510	0.666	0.556
Bystander behaviour (Witnesses to sexist behaviour do not speak out) (2.66)	0.981	0.294	0.724	0.504	0.603	0.684
Gender harassment (2.48)	0.470	0.273	0.122	0.852	0.249	0.498
Encouraged into stereotype (2.44)	0.236	0.992	0.749	0.129		
Harassment not related to gender (2.23)	0.455	0.245	0.368	0.922	0.623	0.611
Employer's refusal to address sexism (2.14)	0.173	0.175	0.185	0.578	0.756	0.763
Sexual harassment climate (Women don't know the sexual harassment complaint procedure, or don't believe it will be taken seriously) (2.13)	0.077* *Employee – 1.91 Management – 2.45*	0.212	0.149	0.651	0.446	0.956
Sexual harassment (2.08)	0.201	0.054* *Married – 1.86** *De facto– 2.00* *Other – 2.56**/*	0.335	0.514	0.265	0.202

*/†The mean difference is significant at 10% level; **/††The mean difference is significant at 5% level

#The average score of the challenge is significantly larger than the mid-level (3).

has a highly significant effect on the lack of respect challenge, and women in managerial positions tend to face this challenge more than those who are not. Sexual harassment climate or the absence of harassment complaint procedure has also been more challenging for female managers when compared to employees.

The mean comparison results in Table 8 confirm that women who are not married or in a de facto relationship suffer more from sexual harassment and lack of respect compared to those who are. This suggests that a woman not in a partnership may be disrespected at the workplace. However, for each relationship status category, the mean score of the sexual harassment variable is below the middle level of the measurement

Table 9. Job-related challenges and influencing factors.

Challenge (Average score)	ANOVA p-values and LSD post hoc test results (Averages and p-values)					
	Occupational role [Employee-22; Mgt-34]	Relationship status [Married-28; De facto-19; Other-18]	Having children [No children-26; Have children-38]	Education [Graduate-31; Not a graduate-33]	Age [≤ 30-15; 31-40-21; > 40 -29]	Experience 1-5 Y – 22; 6-10 Y-18; >10Y 25]
Lack of female role models (3.78#)	0.014** *Employee – 3.23 Management – 4.09*	0.698	0.615	0.858	0.291	0.301
Work overload (3.56#)	0.036** *Employee – 3.27 Management – 3.85*	0.615	0.428	0.064* *Graduate – 3.81** *Not a graduate– 3.31**	0.039** *≤ 30 –3.13*** *31-40– 4.00**/* *> 40 – 3.46**	0.357
Job pressure (long hours are expected, hours are unpredictable, there is excessive work) (3.13)	0.052* *Employee – 2.86 Management – 3.44*	0.673	0.754	0.083* *Graduate – 3.39** *Not a graduate – 2.88**	0.210	0.092* *1-5Y – 2.86** *6-10Y–2.88†* *> 10Y –3.52*/†*
Unpleasant nature of work (risky work, a competitive culture, unsanitary conditions) (2.41)	0.751	0.542	0.834	0.474	0.355	0.249
Lack of flexible work arrangements (2.36)	0.231	0.903	0.791	0.537	0.659	0.403
Lack of site safety (2.03)	0.645	0.674	0.657	0.477	0.161	0.738

*/†The mean difference is significant at 10% level; **/††The mean difference is significant at 5% level

#The average score of the challenge is significantly larger than the mid-level (3).

scale (3), while it is above that value for the lack of respect challenges. Therefore, lack of respect has been a significant hostile sexism challenge for women without partners. At the same time, masculine culture is the most common challenge in that category (Table 5), and it is common to all female construction workers. Although most demographic factors do not affect the level of encountering hostile sexism challenges, several challenges in this category are crucial to all women workers in the construction sector. Masculine culture, behavioural impressions, bystander behaviour, and gender harassment are among these. Therefore, a dominating culture and acceptance of silence could be a problem in NZ construction industry.

Job condition-related challenges

According to the initial assessment of job condition-related challenges (Table 6), the lack of female role models and work overload are largely experienced by women in the NZ construction industry. Work overload is a challenge that affects women at different levels of education and age. For example, employees

older than 30 and those with university degrees tend to be highly overloaded with work. In addition, Table 9 confirms that job pressure characterized by long and unpredictable hours and excessive work is another marginally significant challenge for highly educated and experienced female employees. Specifically, women workers with more than 10 years of experience in the NZ construction industry find job pressure as one of the critical challenges related to job conditions. Since construction is an industry where working experience and knowledge are substantially important, this observation is justifiable. However, according to the current findings, more qualified and experienced women construction employees often struggle to manage their high workload and job pressure (Table 9).

The effect of the occupational role on job condition-related challenges is shown in the ANOVA results (Table 9). Particularly, women in managerial positions find not having female role models, work overload, and job pressure more challenging than the other challenges in this category. In conclusion, the level of job role and education, age, and experience in the NZ construction industry are the demographic factors that are significantly affecting job-related challenges faced by female construction workers.

Discussion

SIGNIFICANT CHALLENGES WOMEN EXPERIENCE

The present study identifies a range of significant challenges. For benevolent sexism, the findings revealed that stereotyping and pressure to prove oneself are two significant challenges women in the NZ construction industry experience. These results support an earlier study by Pollard (2007), which indicated that women are subjected to gender-based stereotyping and undervaluation that impact how their colleagues and supervisors perceive them. Stereotyping leads to assumptions about their abilities or suitability for construction roles. Furthermore, construction women may experience pressure to prove themselves, as they are often viewed as less competent than their male counterparts (Barreto, et al., 2017; Bryce, Far and Gardner, 2019; Ettinger, Conroy and Barr, 2019). Addressing these issues is crucial in creating a more inclusive and supportive environment for women in construction.

For hostile sexism, the presence of masculine culture was the only statistically significant challenge revealed in the current study. This implies that women experience discrimination or marginalization in predominantly masculine work environments. This finding is similar to view held by Dainty and Lingard (2006) and Walker (2019) of women. Behaviours and attitudes such as aggressiveness or competitiveness prevail, making it difficult for women to feel valued or included. Further, masculine culture may lead to unequal treatment, such as pay disparities or being passed over for promotions, as indicated in previous studies (Afolabi, et al., 2019; Barreto, et al., 2017; Galea, et al., 2021). Therefore, ensuring workplaces that value diversity and provide equal opportunities for all employees, regardless of gender, becomes necessary.

Finally, the study found that the lack of female role models and work overload were the two significant job condition-related challenges NZ construction women face. The absence of female role models in a male-dominated industry hinders women's career progressions and limits their growth and development opportunities (Afolabi, et al., 2019; Lekchiri and Kamm, 2020). Also, work overload may lead to stress and burnout, which can negatively impact their mental and physical health. It is essential to address these job condition-related challenges through mentorship programmes, flexible work arrangements, and support systems that could alleviate work overload, thereby promoting the retention and advancement of women in the industry.

Demographic factors that influence sexism and job condition-related challenges

In addressing the second objective of this study, the findings suggest that the educational backgrounds of construction women affect four benevolent sexism challenges (namely, encouraging into stereotypical

industries, gender role differentiation, stereotyping, and presumed incompetency). Women without a university degree encounter greater challenges in terms of gender role differentiation, stereotyping, and presumed incompetency when compared to the average level measured in the study.

Age and industry experience are other demographic factors that affect the benevolent sexism experienced by women in the NZ construction industry. Women who are advanced in age encounter difficulties, like disparities in earnings and being denied promotions. This study finding suggests that older women could encounter difficulties that younger women and possibly other genders do not experience. This finding is noteworthy in that the majority of previous research has examined promotion challenges faced by women but did not specifically focus on the effect of age-related factors (Bryce, Far and Gardner, 2019; Worrall, et al., 2010, Dainty and Lingard, 2006). Factors such as caregiving responsibilities and lack of access to training and development opportunities can compound these challenges. Dainty and Lingard (2006) also confirm that these obstacles can make it difficult for older women to advance in their careers and achieve financial stability. The study also found that addressing benevolent sexism in the construction industry requires focusing on age, experience-related factors, and gender-related issues. Thus, it is significant to create a work environment that is fair and equitable for workers of all ages and experience levels, where promotions and wage increases are based on merit. Tunji-Olayeni (2021) believes that given the multifaceted roles that women play in society, including their family responsibilities and work demands, it would be reasonable to offer equal opportunities for career growth and promotion to both men and women rather than depriving women of such opportunities outright (Bryce, Far and Gardner, 2019, Navarro-Astor, Román-Onsalo and Infante-Perea, 2017).

Another significant demographic factor influencing women's career advancement in the NZ construction sector is whether women have children or not. The study found that this could disproportionately impact their advancement due to maternity leave, childcare responsibilities, and other family obligations. While it may not be a widespread issue that affects every woman, research by Power (2020) indicates that the shift from paid to unpaid care work has resulted in increased inequalities, particularly in single-parent households. Grönlund and Öun (2022) also note that in many cases, when parents choose to work part-time, women tend to reduce their work hours and take on the primary responsibility of caring for their children, leading to a more pronounced division of time along gender lines. Implementing family-friendly policies such as flexible work hours, paid parental leave, and affordable childcare to support working women may help address these challenges (Lingard and Turner, 2022).

The study found that women are not being promoted as quickly as their male counterparts. This aligns with studies by Cortis, Foley and Williamson (2022) and Humbert, Kelan and van den Brink (2019). This may suggest gender bias in the promotion process. Further, women with more years of work experience are delayed in promotions. This suggests that employers may need to look closely at promotion policies and procedures to identify gender-based preferences that contribute to delays. Changes to the promotion process may be necessary in creating objective promotion criteria to ensure that female employees are evaluated fairly and objectively.

The findings suggest that demographic factors have limited influence on hostile sexism challenges. Only three challenges, sexual harassment, sexual harassment climate, and lack of respect, were significantly influenced by the demographic factors investigated, and these findings showed only marginal significance. Further, the results suggest that occupational role and relationship status are the only demographic factors significantly impacting hostile sexism challenges. There is more chance that women at managerial positions experience a lack of respect compared to those in employee-level positions. This finding supports Schmitt's (2021) assertion that the prevailing culture in the industry, which is heavily influenced by masculine values, often results in acts of aggression, hostility, and lack of respect towards women. Moreover, these workers have limited knowledge about the available protocols for lodging complaints regarding sexual harassment. Therefore, a company-wide culture must be created for protecting women from sexual harassment and

respecting them equally as their male counterparts, and this is particularly important for the good mental health of female managers.

Women who are not married or in a de facto relationship experience more sexual harassment and lack of respect compared to women who are. This suggests that there may be a bias against women who do not conform to traditional gender roles. This finding corroborates earlier studies (Minnotte and Pedersen, 2019; Nyanga and Chindanya, 2020). The fact that masculine culture is identified as the significant challenge for this category suggests that lack of respect may be related to the perception that women without partners do not conform to traditional gender norms. The perception may be reinforced by a workplace culture that highly values traditionally masculine traits and behaviours, such as assertiveness, competitiveness, and aggressiveness. This finding suggests that the subordination of women is in line with those reported by Denissen and Saguy (2014).

In this current study, the degree of facing hostile sexism challenges does not seem to be significantly affected by factors like age, education level, or industry experience, even though research shows that such demographic factors play a pivotal role in shaping attitudes towards hostile sexism (Hammond, et al., 2017; Capaldi, et al., 2012). One's relationship status and occupational level may play crucial roles in shaping the understanding of such challenges in the industry. This stems from the finding that single women and women in managerial positions tend to experience more hostile sexism challenges. This category of women may be perceived as manipulative and subversive (Hammond and Overall, 2013) within male-dominant environments. Therefore, the construction industry needs to create work environments that are respectful and free from harassment (Barreto, et al., 2017; Fouad, Fitzpatrick and Liu, 2011), regardless of their employee's demographic factors. This may involve creating reporting mechanisms for employees to report incidents of harassment or discrimination.

Regarding job-related conditions, this study found that work overload affects women differently depending on their occupational role, age and education level. Women who hold managerial positions, are over 30 years old, and possess university degrees are more likely to have excessive workloads. Furthermore, women who are highly educated, have been promoted, and have years of experience in their jobs frequently experience job-related stress due to long and unpredictable working hours. According to the current study, women employees who have worked for more than 10 years face considerable job pressure. Within the construction industry, experience and knowledge are held in high regard. So, it can be presumed that women workers who have gained more experience will likely face higher job demands than those with relatively less experience.

Overall, these current findings are insightful, as they highlight the influence of demography on the nature of challenges that highly qualified and experienced women experience. In previous studies by Tunji-Olayeni (2021), it was confirmed that women struggle to manage their workload and job pressure, which affects their ability to meet family expectations in spite of their position, experience and qualifications. Also, Bostock, et al. (2019), Bowen, et al. (2018), and Afolabi, et al. (2019) reinforce the impact of work-related stress affecting both physical and mental health, and work-family conflict in women, ultimately resulting in increased absenteeism and reduced organizational effectiveness.

These findings underscore the need for employers to provide support and resources to help the aforementioned category of women manage their work demands effectively. Generally, policies and practices that address work overload and job pressure could benefit highly qualified and experienced women employees in the construction industry.

THEORETICAL AND PRACTICAL IMPLICATIONS

This study has significant theoretical implications, as it sheds light on the challenges experienced by women in the construction industry. The study fills a knowledge gap and can inform future research and policy

decisions aimed at improving women's health and wellbeing. The study underscores the importance of addressing occupational role, age, gender, and caregiving-related issues to create a more equitable workplace for women as suggested by Tunji-Olayeni (2021) and Afolabi, et al. (2019). This is in line with Acker's (2006) assertion that such issues could cause exclusion and power imbalances in organizations. To avoid imbalances, employers may need to examine promotion policies and procedures to identify gender-based preferences that could contribute to career delays. Consequently, these findings contribute significantly to the dearth of existing literature on women in the New Zealand construction industry.

There are also significant practical implications of this study. Employers in New Zealand's construction industry must create an unequivocally just and unbiased work environment towards employees from all age groups and backgrounds. The system of promotions and salary increments must be based solely on the merit of the workers, to ensure that every employee is treated fairly and equitably. By implementing such measures, employers can significantly enhance the morale and productivity of their workforce, ultimately leading to the success and growth of the organization. It could be helpful to introduce policies focused on family, which could effectively tackle the difficulties women experience in the workplace due to their role as caregivers. This policy could extend to other genders undertaking similar roles.

Further, the study has broader implications for the construction industry worldwide. It highlights the importance of addressing gender inequality and creating an inclusive culture in the construction industry, a traditionally male-dominated sector as suggested by Dainty, et al. (2004) and Chung and van der Lippe (2020). Addressing these issues can lead to a more diverse and talented workforce, which can enhance productivity and profitability in the industry.

Conclusion and future research

The presented analysis serves as compelling evidence that women in the NZ construction industry experience diverse levels of challenges related to sexism and construction work specific job conditions. Stereotyping, pressure to prove oneself, masculine culture, lack of female role models, and work overload represent the leading challenges found by women in construction. Demographic factors play a significant role in the frequency and level of impact for some challenges. It is evident that the prevailing demographic factors influencing sexism and job condition-related challenges are the occupational role, educational level, industry experience, age, whether women have children, and relationship status. As such, interventions designed to improve the experiences and opportunities of women in the NZ construction industry need to assess diverse challenges in a complex and integral manner by considering the demographic characteristics of the employees.

Given the traditionally male-dominated, multi-layered, and complex nature of the construction industry, addressing age- and gender-related issues represents an important but not simple task in creating a more equitable workplace. To improve women's mental health in the construction industry, there is a need to establish a work environment unbiased for workers of all ages, genders, experience, and responsibility levels that provide equal and fair opportunities. Construction companies implementing family-friendly policies, such as flexible work hours and paid parental leave, encouraging objective promotion criteria and respect for all women, including those without partners, benefit highly qualified, experienced, and motivated female employees.

The investigation into the challenges women in the NZ construction industry face represents the attempt to deal with the issues of sexism, work overload, job pressure, gender diversity, and women's health and wellbeing at source. The findings from this study contribute to the existing literature by highlighting the need for the industry to take demographic factors into consideration when creating initiatives addressing the challenges faced by women in the construction industry. Therefore, further research focusing on solutions is needed to overcome barriers to women's participation in construction and encourage more women to

embark on a construction career. The experiences of women in different roles within construction and their relations to demographic factors deserve further consideration. This study presented a valuable opportunity to scrutinize the experiences of women employed in different occupational roles (22 women working in office environments, 21 onsite professionals, and 22 individuals working in trades), therefore contributing significantly to the existing literature on the subject. Conclusively, this study's findings are significant as they provide a valuable resource for future investigations due to the scarcity of existing research on women in the New Zealand construction industry.

Limitations and Future Research

While this study's findings and analysis have shown evidence of and detailed specific challenges women face in the construction sector, it should be noted that these findings may not be accurately extrapolated to other sectors and industries. Given that this study has only collected data from women in construction, the sample has not captured women's experiences from different work cultures and environments. While traditionally male-dominated fields such as construction may be more likely to perpetuate gender stereotypes and cultivate benevolent sexism, each industry has its own unique culture and resultant environment, leading to different influencing factors which may affect the experiences of women working in those industries. Additionally, the cultural differences between different industries may affect the perception and treatment of women. Attitudes and biases towards women in male-dominated industries cannot be applied to women in all industries. For example, some industries have distinctively more mentorship opportunities, more social pressure to initiate diversity and inclusion initiatives, and an environment where flexible working arrangements are more easily adopted to assist women in family-related commitments. Accordingly, additional research is needed to understand factors within their industry or sector. While the literature review acknowledges ethnicity as a critical factor influencing women's experiences, this study did not include ethnicity because of its sensitivity, which deserves future explorations.

Further research is also needed to understand the factors influencing promotion and career progression delays experienced by women in construction. Due to the study's cross-sectional design, the ability to establish cause-and-effect relationships between the identified challenges and their impact on women in the construction industry over time is limited. Analysis of data collected over a period is critical in understanding the factors influencing promotion and progression, given that these are usually associated with performance over time.

Another limitation of this research is the small sample size of 65 women in the construction industry in NZ. This sample was adequate for the univariate analyses (one sample t-test and one-way ANOVA) conducted in this study. While this analysis provides valuable insights into the experiences and perspectives of these women, this sample size restricts the ability to observe the interactions between the demographic factor studied which can be more interesting and valuable. As such, caution should be exercised when applying the findings from this exploratory study to the entire population as the identified effects are likely to be varied when several demographic factors influence together. Additionally, future investigations could ascertain the population size and consequently sample size, to establish its representativeness. This research primarily focuses on women (and those who identified as such) working in the construction industry. However, it may also be worthwhile to explore data related to men. This could help identify potential similarities or challenges faced by men within the same context, which may require further investigation into gender disparities.

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Appendix 1. Challenges identified in the literature for women in construction – Adopted from Rotimi, et al. (2023)

Categories	Challenges \ Sources	Afolabi, et al., 2019	Barreto, et al., 2017	Bowen, et al., 2018	Bryce, et al., 2019	Ettinger, et al., 2019	Fouad, et al., 2011	Galea, et al., 2021	Hatmaker, 2013;	Kamardeen and Sunindijo, 2017	Lekchiri and Kamm, 2020	Mirmotle and Pedersen, 2019	Morello, et al., 2018	Murphy and Ren, 2010	Ness, 2012	Nyanga and Chindanya, 2020	Oo, et al., 2020	Powell, et al., 2018;	Regis, et al., 2019	Rosa, et al., 2017	Saavedra, et al., 2014	Servon and Visser, 2011	Sunindijo and Kamardeen, 2017	Tapia, et al., 2020	Worrall, et al., 2010
Benevolent Sexism	Encouraged into stereotypical industries													x											
	Sexist recruitment practices																		x					x	
	Gender role differentiation					x				x			x		x				x				x	x	x
	Wage gap	x	x			x				x														x	
	Promotions withheld				x																				x
	Glass ceiling	x	x		x	x	x			x						x	x		x			x		x	x
	Stereotyping	x			x		x	x	x										x	x				x	
	Uniforms or protective equipment are not gender inclusive	x																	x				x		
	Presumed incompetency	x				x			x													x		x	x
	Pressure to prove oneself		x		x	x	x				x			x				x							x
Hostile Sexism	Gender harassment	x	x			x	x		x		x	x							x			x		x	x
	Sexual harassment	x	x				x			x				x		x						x	x		
	Sexual harassment climate										x					x									
	Employer's refusal to address sexism																		x					x	
	Bystander behaviour															x									
	Encouraged into stereotype													x											
	Masculine culture	x	x						x	x	x									x				x	
	Lack of respect	x				x			x	x							x		x						x
	Behavioural impressions	x					x	x						x					x		x	x	x		
	Harassment not related to gender	x						x		x						x						x			
Job Conditions	Lack of female role models				x					x	x									x					
	Work overload							x		x	x									x				x	
	Lack of flexible work arrangements	x	x		x					x														x	x
	Job pressure			x	x		x	x		x	x						x	x		x			x		x
	Unpleasant nature of work	x						x		x							x	x	x	x			x	x	
	Lack of site safety	x								x								x	x	x					