UTS ePRESS

Construction Economics and Building

Vol. 21, No. 4
December 2021

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Citation: Oo, B. L., Lim, T. H. B., and Zhang, Y. 2021. Women Workforce in Construction during the COVID-19 Pandemic: Challenges and Strategies. *Construction Economics and Building*, 21:4, 38–59. http://dx.doi.org/10.5130/AJCEB.v21i4.7643

ISSN 2204-9029 | Published by UTS ePRESS | https://epress.lib.uts.edu.au/journals/index.php/AJCEB

RESEARCH ARTICLE

Women Workforce in Construction during the COVID-19 Pandemic: Challenges and Strategies

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DOI: http://dx.doi.org/10.5130/AJCEB.v21i4.7643
Article History: Received: 23/03/2021; Revised: 23/09/2021 & 15/10/2021; Accepted: 16/10/2021; Published: 20/12/2021

Abstract

Changes and challenges in employment are inevitable under the measures enacted to contain the COVID-19 pandemic. Early evidence suggests that the pandemic would disproportionately affect women compared to men. Focussing on women workforce in construction, this exploratory study examines the challenges associated with changes in their job situations, the adopted strategies in addressing the challenges and their opinions on employment situation of women workforce during the pandemic. Results of a content analysis show that the top ranked challenges are: (i) overworked; (ii) working space; (iii) social interactions; (iv) collaboration; and (v) parenting. The most cited strategies in addressing these challenges are: (i) increased visual communication; (ii) a dedicated workspace; (iii) self-scheduling; (iv) flexible working arrangements; and (v) breaking out work time and personal time. The evidence is suggestive that most challenges are interrelated, and the strategies adopted by the respondents are multi-level and interdependent. The results also show that the most mentioned opinion is the increased caring and domestic responsibilities among women workforce. Under the uncertainty about the duration of the pandemic and future contagion waves, these findings are critical in informing employing organizations' human resource management challenges to better support their female employees during pandemic time and beyond.

Keywords

COVID-19; Challenges; Construction Industry; Strategies; Women

DECLARATION OF CONFLICTING INTEREST The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. **FUNDING** The author(s) received no financial support for the research, authorship, and/or publication of this article.

Introduction

Countries around the world have implemented a series of measures including physical distancing, self-isolation and imposed lockdowns to varying degree in response to the COVID-19 pandemic (Biddle et al. 2020). Craig and Churchill (2021) asserted that the pandemic and the corresponding measures enacted to contain it have affected both how people spent their time and where they spent it. On one hand, government-imposed workplace lockdowns in many countries have provoked a sudden transition to a new unplanned work setting for many for the first time, i.e., switching to working from home (WFH). According to International Labour Organization (2020), more than four out of five people (81%) in the global workforce of 3.3 billion were affected by full or partial workplace closures. In addition, school closures and health fears increased the need for family care, and blurred the temporal and spatial boundaries between paid work and caring for others (Craig and Churchill 2021). On the other hand, changes and challenges in employment are inevitable with loss of jobs and reductions in hours worked reported in the literature that examined the impacts of the pandemic on the labour market in different countries (e.g., Borland and Charlton 2020; Lemieux et al. 2020; Mayhew and Anand 2020). Early evidence suggests that the pandemic would disproportionately affect women compared to men, especially working mothers who have experienced increasing demand for unpaid work (care and housework) due to the COVID lockdowns (e.g., Alon et al. 2020; Qian and Fuller 2020; Rapid Research Information Forum 2020; Reichelt, Makovi and Sargsyan 2020).

The literature is ripe with studies on career barriers faced by women workforce in the construction industry in the pre-COVID area. In addition, their underrepresentation in the industry and the well-documented underutilization of women's abilities and talents are compelling reasons for researchers to use a gender lens in examining the attraction, retention and experiences of women in the industry (Oo, Liu and Lim 2020). It is noted that there are limited publications on proposed strategies or guidance on women's career progression in the industry (Menches and Abraham 2007; Francis 2017), and that the advice and recommendations shared by authors are based on the knowledge accumulated before the COVID-19 pandemic. With no exception, the pandemic has introduced unique circumstances and challenges to women workforce in construction, these include the need to work from home, changes in job situations, changes in housework, childcare and home-schooling following the COVID lockdowns (Oo and Lim 2021). Gausman and Langer (2020) urge that it is a matter of urgency to adopt a gender lens to study the impacts of the pandemic on disadvantaged populations and resource-poor communities, where women are especially vulnerable. Focussing on women workforce in the Australian construction industry, this study explores: (i) the challenges associated with changes in their job situations; (ii) the adopted strategies in addressing the challenges; and (iii) their opinions on employment situation of women workforce during the COVID-19 pandemic. Under the uncertainty about the duration of the pandemic and future contagion waves, this knowledge base is critical in informing employing organizations' human resource management challenges to better support their female employees during pandemic time and beyond.

Literature Review

WOMEN'S CAREER IN CONSTRUCTION IN PRE-COVID-19 ERA

As a minority group in one of the most male-dominated industries with high degree of gender segregation (Ness 2012; Oo, Liu and Lim 2020), it is not hard to find evidence that women workforce in construction have faced barriers related to their career in pre-COVID era. In a systematic literature review, Navarro-Astor, Roman-Onsalo and Infante-Perea (2017) have included as many as 60 publications between 2000 and 2015 on career barriers affecting women in construction. Their review found that the most cited barriers include: difficulty of balancing work and family, gender stereotypes, and the lack of professionalism in

construction organisations' human resource management practices. They further pointed out that human resource management practices that hinder women's career in the industry include: (i) the allocation of positions and work tasks that favouring male workforce both at management level and on-site trades; (ii) paternalism where women are allocated to certain positions (e.g., office-based support services) and men are allocated to others (e.g., site management and site supervisor), thus limiting access opportunities and career progression of women; and (iii) promotion practices that discriminate women which limit their career advancement. Moreover, the industry's culture of presenteeism and long work hours, together with the need of frequent relocations due to its project-based nature have considerable potential to interfere with employees' family lives in a negative way (Lingard and Francis 2004, Francis, Fulu and Lingard 2009).

It is noted that the literature on barriers faced by women in construction is growing in recent years (e.g., Barreto et al. 2017; Ibáñez 2017; Oo, Feng and Lim 2019; Regis et al. 2019; Oo, Liu and Lim 2020), this can partly be explained because women are seen as an untapped resource to meet the workforce demand for both professional roles and skilled tradesmen in the industry (Fielden et al. 2000; Berik and Bilginsoy 2006; Menches and Abraham 2007). Needless to say, women in construction would have to face various challenges and difficulties in addressing career barriers, which are generally presented in a long list in the literature. Correspondingly, researchers have examined the various strategies to overcome career barriers and success factors for women's career in the construction industry (e.g., Fernando, Amaratunga and Haigh 2014; Francis 2017; Rosa et al. 2017; Lekchiri and Kamm 2020). However, there are relatively fewer studies on proposed strategies and/or guidance on career progression compared to a large collection of literature on career barriers (Menches and Abraham 2007). Francis (2017) asserted that the limited guidance on career progression in the literature gives the dominant impression that construction is difficult for all women. The recruitment and retention of women workforce in the industry has been very challenging (Morello, Issa and Franz 2018). Fortunately, some recent studies have reported a rather high level of job satisfaction among women workforce in the industry (e.g., Malone and Issa 2013; Oo, Feng and Lim 2020; Oo, Liu and Lim 2020), which seemingly suggest some women are advancing in today's construction industry (Francis 2017). Above all, it is clear from the literature that individual women are differentially affected by barriers and challenges related to their career in construction in pre-COVID era. The COVID-19 pandemic has, however, introduced unique circumstances and challenges to a large population of employees globally, which could make an already challenging situation more difficult for women workforce in the construction industry.

JOB SITUATION CHANGES AND ASSOCIATED CHALLENGES DURING THE COVID-19 PANDEMIC

There is increasing literature on the impacts of the pandemic on the labour market in different countries with some using a gender lens in their study design. These studies provide early evidence that women suffer more than men in their employment and well-being, especially working mothers (e.g., Alon et al. 2020; Cortes and Forsythe 2020; Etheridge and Spantig 2020; Kristal and Yaish 2020; Qian and Fuller 2020). Most of these studies show that this gender difference could be due to the increasing demand for unpaid work (care and housework) at home among women following the COVID lockdowns, while also managing their paid workload. Reichelt, Makovi and Sargsyan (2020) found that transitions to unemployment, reductions in working hours and transitions to WFH have been more frequent for women than for men, but to varying extent among their sample respondents in the US, Germany, and Singapore. Based on a survey on general population of Australia, Biddle et al. (2020) found that their respondents' perceived levels of job insecurity were very high along with reported loss of jobs, and that women and those born in non-English speaking countries experienced largest reductions in hours worked. In another Australia-based study, Craig and Churchill (2021) reported changes of work status and work location for both fathers and mothers in their study focussing on dual-earner couples with children. While the majority (92%) of their respondents

managed to keep their job position and were WFH, their paid work time was slightly lower and unpaid work time (active care, supervisory care, housework and household management) was very much higher during the lockdowns, especially for mothers.

As highlighted above, a particular major disruption to job situations during the pandemic is the sudden transition to a new workplace setting, i.e., mainly WFH due to the lockdowns. Bonacini, Gallo and Scicchitano (2021) asserted that WFH became a 'new normal' for a large population of employees since it represents the only option to both continue working and minimise the risk of virus exposure. It is noted that there is a spike in publications on WFH phenomenon because of its sudden growth of prominence. Researchers have explored WFH (or known as remote working and telework) from different perspectives including its advantages and disadvantages, its impacts on productivity, and the challenges, opportunities and implications of WFH during and post-COVID era (e.g., Arntz, Yahmed and Berlingieri 2020; Baudot and Kelly 2020; Butler and Jaffe 2020; Cserháti 2020; Ford et al. 2020; Green, Tappin and Bentley 2020; Rudnicka et al. 2020; Raišienė et al. 2020; Bonacini, Gallo and Scicchitano 2021). In terms of challenges associated with the change of normal workplace to WFH during the pandemic, the top ranked challenges in Ford et al. (2020) are: missing social interactions, lack of work-life boundary; poor ergonomics; less awareness of colleagues' work and less physical activity. In Butler and Jaffe (2020), the top challenges are: having too many meetings, feeling overworked, and physical and mental health. Raišienė et al. (2020), on the other hand, identified a long list of 29 challenges associated with telework. These include: lack of face-to-face interaction with colleagues; blurred boundaries between work and personal life; lack of inspirational work atmosphere; self-motivation-related challenges and distractions by other household members. However, it is noted that little has been reported on the strategies adopted by both employers and employees in addressing WFH challenges due to the pandemic. Some of the few noted are the provision of information technology support, rescheduling of meeting times and implementing no meeting on Friday by employer (Butler and Jaffe 2020).

While there is no study, to the authors' knowledge, that specifically focuses on construction workforce, the identified pandemic-specific challenges and strategies in the literature may be shared across different professions. Ford et al. (2020) opined that it is important to keep in mind that remote work during a pandemic is not the same as regular remote work. It could be expected that the former presents a different set of challenges to those who experienced the sudden transition to new workplace setting. For construction workforce, the rate of regular and planned remote work (or WFH) as a flexible work option has been considerably low given the industry's culture of presenteeism and long work hours. Indeed, the teleworkable ratio (i.e., the measurement of the extent of work that can be performed at home) for construction occupations is less than 25%, similar to those in other industries such as agriculture, manufacturing and retail trades (Dingel and Neiman 2020). Thus, the sudden shift to WFH (i.e., change of work location) would present challenges to women workforce in construction. This present study has explored the challenges associated with changes of their job situations, the adopted strategies in addressing the challenges and their views on employment situation of women workforce during the COVID-19 pandemic.

AUSTRALIAN GOVERNMENT RESPONSE TO COVID-19 AND CONSTRUCTION BUSINESSES

As a context for the research findings, this section presents a brief overview of the Australian government response to COVID-19 and the impacts of the pandemic on construction businesses. Australia had a swift and aggressive government response to the pandemic including national and state border closures and strict workplace lockdowns, which were supported with government income maintenance for many whose jobs were lost or threatened (Craig and Churchill 2021). The Australian government announced the JobKeeper payment scheme on 30 March 2020, which is a government subsidy for eligible businesses which have been significantly affected by the pandemic to continue paying their employees (Australian Taxation Office 2020).

Another remarkable scheme was free childcare for working parents for the period between 6 April and 12 July 2020 as part of its economic response to the pandemic (Klapdor 2020). For school-aged children, some states and territories announced learning from home arrangements for most school students in April 2020 (ABS 2020a). The relatively early strict lockdown had so far contained the spread of the disease and easing of restrictions in all states and territories began from mid-May 2020. However, restrictions reinstated in regions of Victoria in July 2020 due to the second wave of the pandemic in the state. In examining the impacts of COVID-19 on businesses in Australia, the ABS's (2020b) survey has focussed on different topics in each monthly release to maintain relevance in a changing environment during the pandemic. Table 1 summarizes the key findings in ABS (2020b) between March and September 2020, i.e., around six months into the pandemic when this study was conducted. It was found that most construction businesses were operating as normal or under modified conditions during the pandemic period, and that they have had faced different challenges including government restrictions on the business operation, cash flow problems, reduced revenue and demand for product or services due to the pandemic.

Table 1. The impacts of the COVID-19 pandemic on construction businesses

Month (2020)	Impacts on construction businesses
March	• 45% of businesses reported that they had experienced adverse business impacts and 95% anticipated impacts over the coming months.
April	• 94% of businesses were operating. • 52% of businesses made changes to the work arrangements (reduced hours worked, changed work location -WFH, placed staff on paid leave). • 74% of businesses reported that reduction in demand for product and services had an adverse impact on operations. • 77% of businesses reported that reduced cash flow had an adverse impact on operations. • 45% of businesses reported that government restrictions had had an adverse impact on operations. • 80% of businesses had registered or intend to register for the JobKeeper Payment scheme.
May	• 35% of businesses were operating as normal. • 65% of businesses were operating under modified conditions.
June	• 56% of businesses reported that revenue had decreased compared to the same time last year. • 46% of businesses reported that their currently available cash on hand would support more than three months on operation.
July	• 9% of businesses experienced difficulties in negotiating changes to rates of pay.
August	• 28.4% of businesses expected difficulty in meeting financial commitments over the next three months.
September	• 33% of employing businesses expected change in the number of hours worked by staff once COVID-19 restrictions are lifted and conditions stabilise.

Source: ABS (2020b) Business indicators, business impacts of COVID-19

Research Method

The present exploratory study is part of a large study on women's job situations in the construction industry during the COVID-19 pandemic, which has been conducted around six months into the pandemic (i.e., between August and September 2020). It adopted a survey design to reach the targeted population - women workforce in the Australian construction industry who are at least 18 years old - in a timely and efficient manner. Data was collected using an online survey questionnaire, which was distributed via emails and social media by professional bodies and women's networks in construction. This purposive sampling process helped to ensure the reliability of data by only approaching women workforce in the industry. Open-ended questions were used in the online survey questionnaire that allow the respondents to answer and provide in-depth responses without the bias associated with restricting responses to predefined alternatives (Zhou et al. 2017). This question type is of practical importance in this study with the intention to explore the subject matters of interest following the unprecedented disruptions caused by the pandemic. First, the respondents were asked to specify the key challenges associated with the changes in their employment status, work location and working hours (Q1). This was followed by questions on the strategies they adopted to overcome the respective key challenges (Q2). Lastly, they were asked to share their opinions on the employment situation of women workforce during the pandemic (Q3). Thematic analysis was conducted to identify, analyse, and report patterns (themes) within the data (Braun and Clarke 2006). This analytical method suits questions related to people's experiences, or people's views and perceptions (Braun and Clarke 2019), which are the focus of the present study. Its selection is further justified by its flexibility that allows emergent themes which can provide a rich and detailed account of the data (Braun and Clarke, 2006), and its ability to capture possible unexpected responses from the respondents in the COVID-19 pandemic era. The six-phase process in Braun and Clarke (2006) were adopted in the analytical process where the authors independently reviewed and analyzed the qualitative data to identify key themes within the data. These phases involved familiarization with the dataset, coding, generating initial themes, reviewing themes, defining and naming themes and reporting of results. The analysis itself was a recursive process, with movement back and forth between different phases to facilitate a rigorous process of data interrogation and engagement (Braun and Clarke, 2006). If the authors did not agree on the themes, these were discussed until consensus was reached.

Results

PROFILE OF THE RESPONDENTS

A total of 80 respondents had responded to the open-ended questions in the online questionnaire survey. It was not possible to keep track of number of surveys sent because of the use of emails and social media and the fact that researchers had no access to email address books of the supporting organizations. While the number of responses is considerably low for a survey with this recruitment method, it is recognized that the COVID-19 pandemic has placed considerable strain on people from all walks of life globally that could justify the response rate. It should be noted that the respondents were given an option not to answer the open-ended questions. Nonetheless, it is encouraging to note that there are instances where some respondents specify multiple key challenges and/or strategies in their responses, along with their opinions women's employment situation during the pandemic, providing a rich qualitative dataset for the analysis. Indeed, the response rate for open-ended questions could be very low (Zhou et al. 2017), the respondents' willingness to spend time on the optional open-ended questions seemingly reflects their interest and seriousness to share their experiences on a voluntary basis. Thus, their responses are useful and relevant to this exploratory study. Table 1 shows the profile of the respondents with the majority (72.5%) of them aged between 26 and 45 years old. Above 70% of the respondents were born in Australia and the percentage of

Table 2. The respondents' profile

Profile	Freq.	Percent
Age		
18 - 25	6	7.5
26 - 35	34	42.5
36 - 45	24	30.0
46 - 55	13	16.3
56 and above	3	3.8
Country of birth		
Australia	57	71.3
Overseas	23	28.8
Highest level of education		
Secondary	1	1.3
Certificate	6	7.5
Advanced Diploma/ Diploma	7	8.8
Undergraduate degree	40	50.0
Postgraduate degree	26	32.5
Years of experience in the industry		
Less than 1 year	2	2.5
1 - 5	21	26.3
6 - 10	20	25.0
11 - 15	11	13.8
16 - 20	12	15.0
21 - 25	7	8.8
25 and over	7	8.8
Current employment status		
Self-employed	1	1.3
Employed by an organization (private or public sector)	73	91.3
Family business	1	1.3
Do not have a paid job	5	6.3
Current working location[a]		
NSW	39	45.3
QLD	10	11.6
VIC	19	22.1

Table 2. continued

Profile	Freq.	Percent
ACT	10	11.6
NT	0	0.0
SA	3	3.5
WA	5	5.8
TAS	0	0.0
Current annual job income (before tax)		
41k - 60k	5	6.3
61k - 80k	11	13.8
81k - 100k	7	8.8
101k - 120k	12	15.0
121k and above	32	40.0
Prefer not to answer	8	10.0
Do not have a paid job	5	6.3
Your income is the primary source of support for your family		
Yes	48	60.0
No	32	40.0
Caring responsibilities		
Yes (parents, children and others)	32	40.0
No	48	60.0

[a] There are six respondents worked in at least two states and territories

respondents with undergraduate and postgraduate degrees is as high as 82.5%. About 90% of respondents were employed at the time of survey and they worked across different Australian states and territories. In terms of working experience, above 70% of them have had above five years of experience in the industry. Sixty percent of the respondents were primary income earners in their family, and 40% of respondents have caring responsibilities.

CHALLENGES

Table 3 shows the challenges associated with three categories of changes in the respondents' job situations, i.e., employment status, work location and working hours during the pandemic. The identified challenges were ranked from the highest to the lowest based on frequency counts in individual categories. It should be noted this frequency count is not the number of respondents since some respondents had stated multiple challenges. Also, some challenges are identical to one or more changes in job situations. For example, most of the challenges associated with changes in work location are applicable to changes in working hours. For changes in employment status, the most cited challenge is to deal with job loss during the pandemic, which had affected a small number of respondents. Next, changes in work location recorded the highest total (n = 47) of which the three most cited challenges are working space, social interactions and collaboration

Table 3. The challenges associated with the changes in the respondents' job situations during the pandemic

Challenges	Freq. *n**
Changes in employment status	
Loss of job	5
Less income (or pay cut)	2
Went from full-time to part-time	1
Total	8
Changes in work location	
Working space	10
Social interactions	9
Collaboration/ communication	7
Children/ parenting	6
Work stress	4
Motivation	3
Distractions	3
Physical/ mental health	2
Work-life balance	2
Overworked	1
Total	47
Changes in working hours	
Overworked	19
Less income (or pay cut)	6
Work-life balance	4
Physical/ mental health	3
Social interactions	2
Children/ parenting	1
Work stress	1
Working space	1
Total	37

*Some respondents have stated multiple challenges.

(or communication). Eight challenges, on the other hand, were associated with changes in working hours. Overworked ranks top in this respective list of challenges with a frequency count as high as 19 (out of 37). Overall, these findings provide suggestive evidence that challenges associated with changes in work location are more profound than the other two categories during the pandemic.

STRATEGIES

Table 4 shows the strategies adopted by the respondents to overcome the challenges associated with the changes in their job situations during the pandemic. These strategies have been ranked based on the respective frequency count in individual categories. Similar to that of identified challenges, some strategies adopted by them are applicable to one or more changes in job situations. For example, the strategies of flexible working arrangements, breaking out work time and personal time and self-scheduling have been adopted by the respondents in response to challenges associated with changes in work location and working hours. For the small group of respondents who were dealing with job loss, pay cut and reduced hours worked, the adopted strategies are rather straightforward, involving job hunting and job change. Corresponding to the number of identified challenges in Table 3, the recorded total count is highest for changes in work location category (n = 52) and followed by changes in working hours (n = 22). However, there is a lack of evidence to suggest that there exists prominent strategies for these two categories given that the frequency distribution of the adopted strategies is somewhat scattered. Here, the top five strategies are: (i) increased visual communication; (ii) dedicated workspace; (iii) self-scheduling; (iv) flexible working arrangements; and (v) breaking out work time and personal time.

OPINIONS ON WOMEN'S EMPLOYMENT SITUATION

The 80 respondents had shared their opinions with a total count of over 5000 words for this third open-ended question, further demonstrating their seriousness in completing the survey and the relevance of their responses. Table 5 shows the respondents' opinions, totalling 147 on women's employment situation during the pandemic as many of them stated more than one opinion in their responses. As expected, individual respondents would have different personal opinions, and their opinions were grouped into seven categories. For the first category of neutral opinion (n = 11), the respective respondents had specifically stated that they were not able to share their opinions because no changes had occurred in their employment situation and/or they were not aware of others' employment situation. Also, the next category of opinions is that the pandemic has little to no impact on women's employment situation (n = 17). For the remainder five categories, the respective frequency distribution ranges between 22 and 29. Of these, the most mentioned opinions are in the category of increased caring and domestic responsibilities among women workforce in the industry (i.e., C7). While the respondents' opinions were rather focussed on the impacts of the pandemic (i.e., C3 to C5), it is interesting to note that their opinions are divided between those who opined that the pandemic affects women more than men (C4), and others who believed that the pandemic affects women and men equally (C5). The remarks made by the respondents have been included in the discussion section in revealing the foundations of their opinions.

Discussion

The demographic profiles of the respondents suggest that most of them are experienced workforce with post-secondary education. While most were employed at the time of the survey, the respondents have different personal circumstances including caring responsibilities and income support for their family, and these may shape their response to the pandemic. The results show that most challenges and adopted strategies associated with changes in the respondents' employment status, work location and working hours are interrelated and/or identical, especially for the last two categories. Moreover, the strategies adopted by the respondents are multi-level, interdependent and can reinforce each other. These similarities, interrelations and/or interdependence are rather simple and logical as evidenced in many instances. First, on the challenges of job loss, pay cut or reduced hours worked, while job hunting, it is expected that the

Table 4. The strategies adopted to overcome the challenges associated with the changes in the respondents' job situations during the pandemic

Strategies	Freq. *n**
Changes in employment status	
Looking for new job	3
Changed job	2
Negotiated redundancy	1
Total	6
Changes in work location	
Increased visual communication	13
Dedicated working space	7
Working space setup	6
Maintain strong and consistent connections with project team	5
Flexible working arrangements	4
Breaking out work time and personal time	4
Self-scheduling	3
Learning new technologies and took on the opportunity for skills development	3
Self-adaptation	2
Balancing caring responsibilities and work	2
Organised virtual work socialisation	2
Practising stress reduction techniques	1
Total	52
Changes in working hours	
Self-scheduling	5
Flexible working arrangements	4
Budgeting expenses	4
Breaking out work time and personal time	3
Practising stress reduction techniques	3
Increased visual communication	1
Self-adaptation	1
Learning new technologies and took on the opportunity for skills development	1
Total	22

*Some respondents have stated multiple strategies.

Table 5. The respondents' opinions on women's employment situation during the pandemic

	Opinions	Freq.*
C1	Neutral opinion	11
C2	COVID-19 has little to no impact on women's employment situation	17
C3	COVID-19 has negative impacts on women's job security and career progression	22
C4	COVID-19 has negative impacts on women's employment situation more than men	22
C5	COVID-19 impacts women's and men's employment situation equally	23
C6	Changes of working arrangement (WFH, flexible working arrangement)	23
C7	Increased caring and domestic responsibilities	29
	Total	147

respondents would budget their expenses due to the challenge of loss or reduced income. This combination of interrelated challenges and strategies is evident in the current findings. Next, on the similarities of challenges and adopted strategies for both changes in work location and working hours, this can partly be explained because work location and number of working hours are highly interrelated. In the construction industry, for example, site-based employees work longer, more irregular hours than office-based employees (Lingard and Francis 2004). Thus, in the context of the present study, change in work location due to the pandemic (i.e., WFH and working partly in normal workplace and partly from home) is greatly associated with the respondents' hours worked (von Gaudecker et al. 2020). Indeed, Lingard and Francis (2004) found that construction employees' work-life experiences appear to be more closely related to the nature of employees' job conditions, as indicated by work location and number of working hours. Another possible explanation for the similarities is that the pandemic has provoked a sudden transition to a new unplanned work setting for many for the first time. For a large population of employees who normally worked in normal workplaces (for e.g., office and site-based for construction employees), this sudden transition may contribute to the blurring lines of differences between challenges (and the respective strategies) associated with work location and working hours. It is noted that few recent studies that examined the challenges associated with change of work location (i.e., WFH) have not attempted to distinguish between work location and working hours (e.g., Ford et al. 2020, Rudnicka et al. 2020). However, despite the observed similarities in the present study, the findings provide an insight that is refreshing to better reflect the personal experiences of dealing with challenges associated with changes in work location and working hours due to the COVID lockdowns.

Having discussed the observed similarities and interdependence of the wide range of challenges and strategies shared by the respondents, the subsequent discussion focusses on the top ranked challenges associated with both categories of changes in work location and working hours and the respective strategies in addressing these challenges. The ranking was performed by summing up the frequency counts of individual challenges from both categories. Of all the challenges, the top five challenges are overworked (n = 20), working space (n = 11), social interactions (n = 11), collaboration (or communication, n = 7) and children (or parenting, n = 7). This is followed by discussion on the respondents' opinions on women's employment situation during the pandemic. An attempt was made to include verbatims from the respondents in revealing the scale at which these experiences exist.

OVERWORKED

The most cited challenge is overworked, which includes increased workload, too many virtual meetings, working longer and more irregular hours later into the evening or at night and weekend. Some remarks include:

> *Not finding time for self-care. Everything is urgent and it is expected that I am available all the time.*

> *Excessive workload; required to work at night and over weekends.*

> *Longer hours; crammed diary [with] back-to-back virtual meetings.*

Many respondents have attempted multiple strategies in addressing this challenge through self-scheduling. Their self-scheduling strategies include: "Structuring my day to sit at the computer between set hours, and create routine to my day.", "Trying to keep same routine as for pre-COVID (getting up at same time, etc.)." and "Plan my day with lists."

Other interdependent strategies shared by the respondents include breaking out work time and personal time and adopting flexible working arrangements, while trying to balance caring responsibilities and work. Some of them made comments such as:

> *Turn computer off as soon as office hours are complete.*

> *Packing up workstation and leaving the house (even if it's just outside the house).*

> *I will work longer into evening as I often take more breaks during the day to get me out of the apartment when I am feeling cooped up.*

> *I have made an effort to start the workday a bit later to compensate for the late hours that occur regardless of what time I start work.*

> *Patience, flexibility [and] recovering work hours at night after kids went to bed.*

> *Working in different locations, taking short breaks and keeping the children occupied.*

WORKING SPACE

With a sudden transition to a new workplace setting (mainly WFH), it is not surprising to find that working space is another most cited challenge. Some respondents were not prepared to work from home, and they seek assistance from IT team in their company. Also, they have commented on the lack of access to information technology resources including printer and monitor screen. For some, the experience was rather negative, one said, "No home office; isolation; mental health and less productive." This expression, although without much elaboration, clearly indicate the complexity of multiple challenges involved. Another respondent captures her experiences, saying:

> *It is particularly challenging spending majority of time at work at a time when everybody else is at home. It's an additional struggle when there are less social outings to provide a reprieve from the intense work environment.*

The respondents have adopted different strategies in addressing working space related issues via setting up their dedicated working space including a new working space at home. Some remarks include:

Dedicated working spaces for me and each child so that meetings could be held [and to] avoid noise contamination. Needed a Wi-Fi booster at home.

Set up home office [and] all meetings [go]virtual. More meetings with my team for morale or support.

Set up a better working from home setup [and] tried to catch up socially with people via video conferencing or outdoor activity.

SOCIAL INTERACTIONS

It is evident from the respondents' remarks that WFH is highly associated with lack of social interactions. Indeed, missing social interactions topped the list of twenty challenges faced by a large cohorts of software engineers who were WFH (Ford et al. 2020). With the nature of construction jobs that require long working hours and presenteeism, a sudden transition to WFH was a new experience for many. Some remarks include:

Meetings are conducted online. No real connections to people…

Working 100% from home was lonely…

Lack of interaction with colleagues…

Not having direct access to team members and being able to meet in person.

Increased visual communication was cited most frequently as the key strategy where the respondents have been sending more emails, making more phone calls and organizing extra virtual meetings and team chats to maintain strong and consistent connections with project team. Various virtual meeting applications cited include Microsoft Teams, Zoom and Skype. Some have taken additional steps in increasing interactions by organizing virtual socialisation, such as "Friday online drinks.", "Extra activities and team quizzes etc." and "Daily 9am with team."

COLLABORATION (OR COMMUNICATION)

The next top challenge associated with the sudden transition to a new workplace setting is the collaboration or communication issues. Given the project-based setting for construction projects, the respondents shared their difficulties in dealing with project collaboration or communication. Some commented that it has become difficult "to communicate with other team members, [thus] affecting productivity.", "to remain engaged with team and keeping up project support." and "to manage team remotely."

The adopted strategies are rather interdependent, i.e., by increasing visual communication and maintaining strong and consistent connections with project team. Some shared their strategies including:

I have been using Microsoft Teams and online applications more actively to ensure team members are engaged and responsive.

Increased team engagement via skype etc., [and] lots more deliberate remote meetings.

[Having] extra virtual meetings [and] implementing strategies to keep teams connected.

CHILDREN (OR PARENTING)

Caring for children or parenting was a key challenge for the respondents with caring responsibilities. Some said it was challenging to balance parenting and work commitments, suggesting these two challenges are interrelated. Rudnicka et al. (2020) asserted that caring for children was both the most common distraction and most taxing added responsibility for their respondents, and that those with caring responsibilities rarely have time to reflect on their work-life balance. Also, there are hard aspects of parenting during the COVID lockdowns, especially the challenge of home-schooling children while fulfilling their paid workload. Another hard aspect of parenting was the fact that younger children did not understand the changes in job situations of their parents. Some remarks include:

> *Working from home whilst children were learning from home.*

> *Having to get children to understand that staying in their rooms whilst teleconferencing.*

The key strategies adopted by the respondents include: setting up dedicated working spaces for themselves (and children), adopting flexible working arrangements in their attempts to balance caring responsibilities and work, as remarked above. Also, one said she *"used the daycare option."* Another respondent tried *"organising food deliveries, routines, and stopping personal activities."*

In addition to the top five challenges and the associated strategies, it is worth noting that other challenges and strategies shared by the respondents do provide some additional insight on the diversity of their experiences. For example, on physical or mental health challenge which is likely to be associated with overworked, lack of social interactions, and the demanding nature of work and family responsibilities, some have practiced stress reductions techniques including reaching out to friends, having daily walk and taking a break from work. However, there are some exceptions. First, while some have mentioned their strategies using a generic term such as self-adaptation, there are a few respondents (n = 4) who commented that there was no resolution yet at the time of the survey. This seemingly suggest this respective group could have faced more complex challenges for some reasons. Next, it is noted that some of the identified challenges were seen as benefits for some, for example, some took on the opportunity for skills development, and some enjoyed the flexibility associated with WFH and claimed that they worked more efficiently with less distractions and commuting. These differential experiences were indeed reported in Ford et al. (2020), which they opined that these experiences were driven by individual personal contexts and characteristics of their work.

THE RESPONDENTS' OPINIONS ON EMPLOYMENT SITUATION

On the negative impacts of the pandemic on women's job security and career progression (C3), some commented on high job insecurity, less job opportunities due to a slow down in construction demand; and that the pandemic hindered their career progression. Their remarks include:

> *The working situation during COVID is concerning as it can add to career stagnation.*

> *The pandemic has definitely slowed or stopped opportunities for career advancement.*

> *I do worry a bit for the future and feel like it will be harder for me to progress and experience pay rises as there is less work and companies tighten their spending.*

Next, on the divided opinions on the impacts of the pandemic on women and men (C4 and C5), it is rather surprising that some respondents stated that the pandemic impacts women and men equally when they were specifically asked about the employment situation of women during the pandemic. Some commented that:

> *As a PM, I don't think a female would be let go ahead of a male counterpart.*

Some companies I know have made redundancies and had pay cuts but from what I've heard this hadn't been gender focussed.

Haven't seen a difference between male or female employment during this time. If anything, more men are losing their jobs as they are the majority of workers in the sector.

As a construction supervisor…I see the struggles my workforce is going through. The industry is quiet, which is causing hours to have to be split between people who would normally working full time. This, however, is not gender-related from what I have seen myself.

For those who believed that the pandemic has negative impacts on women's employment situation more than men, the foundations of their opinions were mostly based on their personal experiences in their workplace. Some remarks include:

For my experience women have been hit harder by the consequences of COVID-19 (e.g., in my office the majority of people that had their working hours reduced were women).

In my organization, women have been affected disproportionately, with more women losing their jobs than men.

I was the only female working in a construction firm, and the first to be put onto JobKeeper in spite of half of our office [staff] being at the same level or being in the same position or more junior than myself. I ended up changing career as this was basically the last straw for me in relation to my experience in the construction industry.

We have been sourcing some junior staff since July [2020], my observation is I have never had so many female candidates. Most lost their jobs in November or December [2019] and March or April [2020] and all were overqualified for the role.

Turning into the respondents' opinions on changes of working arrangement and increased caring and domestic responsibilities (C6 and C7), on one hand, some respondents shared that the downsides of WFH are mainly on increased caring and domestic responsibilities experienced by women as claimed in the literature (e.g., Alon et al. 2020; Etheridge and Spantig 2020). On the other hand, there are respondents who welcomed flexible working arrangement associated with WFH despite the associated challenges, and they were looking forward to flexible working arrangement in post-COVID era. They commented that:

Hoping that flexible working supports better diversity in the future.

I think that [the pandemic] has provided alternative working arrangements, and shown that 'working from home' is a viable option, and made all the 'non-believers' be forced into trialling how the system would work. If people want to work, they will do whatever they can, when they can, if they are allowed flexibility. A lot of roles can provide this, but just needed a bit more of an open mind to allow it to occur.

I hope the flexibility employers have had to show during this time can continue. I've needed to work flexibly but I've still met all deliverables and client expectations. I don't need to be in an office [and] in front of the managers for me to show I'm effective at my job.

I think [the pandemic] has shown a light on flexible working arrangements, the days of white-collar construction professionals being chained to their desks 6 days a week are not necessary, nor sustainable. Businesses will attract and retain employees by adapting flexible working arrangements, including working offsite from business premises.

SUMMARY

In summary, while there is no similar study on this subject area among construction professions for comparisons, many of the challenges and strategies emerged from this study aligned with those studies that involved other professions during the pandemic (e.g., Ford et al. 2020, Butler and Jaffe 2020). Also, it is recognized that some of the challenges and strategies (such as overworked, work-life balance and breaking out work time and personal time) are not unique and have been reported in previous construction workforce studies in pre-COVID era (e.g., Lingard and Francis 2004; Navarro-Astor, Roman-Onsalo and Infante-Perea 2017; Oo, Liu and Lim 2020). However, given the unique circumstances associated with a sudden change in job situations following the pandemic, most challenges (such as working space, parenting and social interactions) and the respective strategies in the present study are specific to the pandemic. These pandemic-related challenges are consistent with early evidence on the possible negative impacts of the pandemic on women workforce in terms of caring responsibilities, disruptions to working hours and paid work capacity, especially working mothers (e.g., Alon et al. 2020, Rapid Research Information Forum 2020; Reichelt, Makovi and Sargsyan 2020). Indeed, other than negative impacts of the pandemic on women's employment situation, the most mentioned opinion in the present study is the increased of their caring and domestic responsibilities. Above all, both shared and divergent experiences and opinions among the respondents are expected given their varied personal circumstances (including family responsibilities), work location and job characteristics before and during the pandemic.

RESEARCH IMPLICATIONS

The findings from this exploratory study have practical implications to employing organizations. For employers and managers, knowing that 'one size does not fit all' is critically important for supporting their employees' employment and well-being in response to a pandemic. With the COVID-19 pandemic, by firstly understanding the challenges female employees have had faced, and that there are possible strategies for addressing the challenges, they could develop protocols to better support their female employees now or in the future. The divergent experiences and opinions revealed could also be considered in the development of the respective protocols including WFH and/or flexible working arrangements. Green, Tappin and Bentley (2020) opined that the change to WFH forced by the COVID-19 could indeed be used as an opportunity to simulate innovation and development to enhance organizational capabilities including the development of sustainable WFH protocols for possible disruptive events in future. This is particularly applicable in the case of the COVID-19 pandemic if restrictions have to be reapplied in response to future contagion waves. Indeed, a hybrid model of working some time at the office (or normal workplace) and some time at home has been seen as a 'new' normal with COVID-19 (e.g., Green, Tappin and Bentley 2020; Hite and McDonald 2020; Bonacini, Gallo and Scicchitano 2021), which may give rise to an opportunity for employing organizations to consider it an option towards greater retention of women workforce in the industry as opined by some of the respondents.

Conclusions

The professional women in construction participated in this exploratory study shared the challenges associated with changes in their job situations, the strategies they adopted in addressing the challenges, and their opinion on women's employment situation in the industry during the COVID-19 pandemic. Most of them had experienced multiple challenges and the evidence is suggestive that most challenges are interrelated. Likewise, the strategies adopted by the respondents are multi-level and interdependent. Results of a content analysis show that the top ranked challenges are: (i) overworked; (ii) working space; (iii) social interactions; (iv) collaboration; and (v) parenting. The most cited strategies in addressing these challenges are: (i) increased visual communication; (ii) a dedicated workspace; (iii) self-scheduling; (iv) flexible working

arrangements; and (v) breaking out work time and personal time. While the respondents highlight the increased caring and domestic responsibilities among women workforce, it is important to recognize there exists divergent experiences and opinions among the respondents given their varied personal circumstances (including family responsibilities), work location and job characteristics before and during the pandemic. Unfortunately, given the fact that the pandemic will not end in the short term and some countries are grappling with contagion waves, changes and challenges in employment are inevitable and may continue for some time. Thus, an understanding the challenges employees have had faced due to disruptive changes during the pandemic, and an insight into the possible strategies are critical in addressing human resource management challenges. The findings have implications for employing organizations in construction businesses on how to better support women workforce in their organization during a pandemic through the development of appropriate protocols. The divergent experiences and opinions revealed could also be considered in the development of sustainable protocols on WFH and/or flexible working arrangements for possible disruptive events in future. Indeed, under the uncertainty about the duration of the pandemic and future contagion waves, it is logical to suggest that these protocols are deemed necessary in addressing the challenges of retention of women workforce during and post COVID-19 pandemic.

There are limitations in this exploratory study. The focus here is on professional women in the construction industry and the sample size is rather small due to difficulties faced in recruitment of respondents during a pandemic outbreak. While it is felt that the present findings are useful and relevant to provide the first insight into experiences of women in construction on the subject matter, future study should include other cohorts of interest including construction tradeswomen and women labourers. Indeed, the divided opinions observed in the current study on the impacts of the pandemic on women and men have prompted the need of further study on its impacts on construction workforce regardless of gender or role. The other limitation is the limited scope of this exploratory study. There are many other aspects that future studies could consider including the relevance of WFH and/or flexible working arrangements from the employers and employees' perspectives, changes in employers and employees' attitudes and preferences towards WFH and/or flexible working arrangements, the relationship between employees' personal circumstances, work productivity, work-life balance and well-being with WFH and/or flexible working arrangements. A collection of future studies that capture all these possible aspects would contribute towards the development of conceptual frameworks on the impacts of the pandemic on construction workforces. Future studies should also consider different research design including using focus group methods to gather evidence in building on the knowledge base on this subject area.

Acknowledgements

Sincere thanks are due to respondents who took time to complete the online questionnaire survey during the pandemic times. The undertaking of the online questionnaire survey required considerable supports from organizations supporting women in the industry by assisting with the distribution of the questionnaire via emails and/or social media. Grateful thanks are due to National Association of Women in Construction (NAWIC), Tradeswomen Australia and Women in Trades Network.

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