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RESEARCH ARTICLE

Changes in Job Situations for Women Workforce in Construction during the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic has introduced unique circumstances to women workforce in construction including the need to work from home, changes in job situations and family responsibilities following the lockdowns. This exploratory study was conducted around six months into the pandemic in examining the changes of their job situations, and their perceptions of career aspects during the pandemic. The results show that most respondents were employed full-time at the time of survey, and that there were profound changes to their work location and working hours including working from home and worked more hours than usual. Their perceived negative impacts of the pandemic on their capacity to engage in paid work activities due to caring responsibilities, pay or earnings, job security, and career progression and advancement are modest. They were also seemingly confident in staying in their job in the next 12-month. Their perceptions have been found significantly associated with their age, education level, and years of experience in the industry. These findings provide a critical insight on women's job situations in the industry during the pandemic, with implications for human resource practices towards addressing the challenges in retention of women workforce during and post COVID-19 pandemic.

Keywords

Career; Construction Industry; COVID-19; Employment; Women

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Introduction

The COVID-19 pandemic is raging worldwide and causing unprecedented disruptions to much of the population globally in many aspects. As countries around the world are taking steps to respond to the pandemic, the literature on the pandemic is exploding to document its impacts on public health, economic, political, education, and many other societal aspects. A search on the Google Scholar search engine using 'COVID' as the keyword had returned a total of 1.77 million results as the time of writing (November, 2020). One of the focuses of these vast number of publications is on the consequences of the pandemic on the labour market and people's employment in different countries (e.g., [Borland and Charlton, 2020](#); [Lemieux, et al., 2020](#); [Mayhew and Anand, 2020](#)). Some authors have adopted a gender lens on this subject area and found that women suffer more than men in their employment due to the pandemic (e.g., [Alon, et al., 2020](#); [Kristal and Yaish, 2020](#); [Qjan and Fuller, 2020](#); [Rapid Research Information Forum, 2020](#); [Reichelt, Makovi and Sargsyan, 2020](#)). [Gausman and Langer \(2020\)](#) urge that it is a matter of urgency to adopt a gender lens to study the impacts of the pandemic including the policies and actions that are put into place at the global, country, and local levels. They pointed out that gender consideration in study design is of especially importance in disadvantaged populations and resource-poor communities, where women are especially vulnerable. The focus of this exploratory study is on women workforce in the construction industry.

The construction industry is one of the most male-dominated industries with greatest degree of gender segregation ([Ness, 2012](#)). There is a large collection studies on barriers faced by women and strategies aimed at improving their retention and career progression in the industry ([Navarro-Astor, Román-Onsaló and Infante-Perea, 2017](#)). Moreover, the recruitment of women into the industry has always been a challenge as demonstrated by previous studies that attempted to explore this subject area with the focus set on attracting and retaining female students in construction management undergraduate degree program (e.g., [Bigelow, Saseendran and Elliott, 2018](#); [Escamilla, Ostadalimakhmalbaf and Bigelow, 2016](#); [Oo, Li and Zhang, 2018](#)). It is hoped that if female enrolment and retention in construction management programs increased, so would the female participation in the construction industry ([Bigelow, et al., 2015](#); [Moore and Gloeckner, 2007](#)). Despite of their underrepresentation and barriers in their construction career, previous findings on women's job satisfaction in the industry are rather mixed. On one hand, there are evidence of their dissatisfaction with their construction career along with reported high intention to leave the industry (e.g., [Dainty, Neale and Bagilhole, 1999](#); [Dabke, et al., 2008](#); [Hee and Ling, 2011](#)). On the other hand, it is encouraging that 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, Lim and Feng, 2020](#); [Oo, Liu and Lim, 2020](#)). Nonetheless, the COVID-19 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. While little is known about their employment and other aspects of their overall livelihood during the COVID-era, the focus on this exploratory study is, however, on (i) the changes of their job situations, and (ii) their perceptions of career aspects and job prospects during the pandemic. The findings provide an understanding that is critical to addressing the challenges and difficulties in retention of women workforce in the industry during and post COVID-19 pandemic. This understanding brings with it some important implications for construction employers, especially the formulation and development of respective human resource practices to better cater for the needs of women workforce in their organization due to the changes in job situations that are associated with COVID-19. In addition, this study contributes to the knowledge area on gender equality in the construction industry by providing an initial insight on women's experiences of job situation during a pandemic time.

Women in construction and the COVID-19 pandemic

The literature is ripe with studies on women workforce in the construction industry. [Oo, Liu and Lim \(2020\)](#) asserted that the underrepresentation of women and the underutilization of women's abilities and talents are compelling reasons for researchers to examine the attraction, retention and experiences of women in the industry. A major collection in the literature is on the barriers faced by women workforce in the industry, and it is rather common for researchers to identify a long list of barriers (e.g., [Menches and Abraham, 2007](#); [Navarro-Astor, Román-Onsalo and Infante-Perea, 2017](#); [Lekchiri and Kamm, 2020](#)). In [Navarro-Astor, Román-Onsalo and Infante-Perea's \(2017\)](#) systematic literature review of 60 publications between 2000 and 2015 on career barriers affecting women in construction, difficulty with work-life (or work-family) balancing ranked 1st with 32 (i.e., 53%) literature examined cited this barrier. Most of the respective literature found that multiple role conflict and the need to balance personal life with work are still a problem almost exclusive to women. For example, the women architects from the UK and Spain in [Caven and Navarro-Astro \(2013\)](#) feel that they still need to choose between family and career. However, in another study that involved construction employees in Australia, [Lingard and Francis \(2004\)](#) found that there is no significant difference in work-life experiences between men and women if their work location (i.e., office and site-based) has been considered. They claimed that work-family experiences appear to be more closely related to the nature of employees' job conditions, as indicated by work location and number of working hours. On the other hand, [Malone and Issa \(2013\)](#) found that flexibility and balance between work and personal time is a top ranked factor affecting women's organizational commitment and desire to stay with their employers in the US construction industry. Indeed, the recruitment and retention of women workforce in the industry has been very challenging ([Morello, Issa and Franz, 2018](#)) since there are many other barriers on different aspects of their construction career. These include ([Navarro-Astor, Román-Onsalo and Infante-Perea, 2017](#)): (i) working conditions that require long working hours and presenteeism; (ii) lack of promotion opportunities and slow career progression; (iii) receiving less pay than male counterparts for equivalent work; and (iv) allocation of tasks that favouring male workforce. [Navarro-Astor, Román-Onsalo and Infante-Perea \(2017\)](#) further pointed out that career barriers are multi-level, interdependent and can reinforce each other, and that individual women are differentially affected by barriers related to their career. Moreover, the COVID-19 pandemic could make an already challenging situation more complex for women in the industry.

Since the outbreak of COVID-19, countries around the world are taking steps to respond to the pandemic by implementing a series of physical distancing and isolation measures to varying degree ([Biddle, et al., 2020](#)). These include imposing 'lockdowns' (i.e., including restrictions on non-essential travel, closing schools and non-essential businesses) and issuing 'stay-at-home' orders. More than four out of five people (81%) in the global workforce of 3.3 billion were affected by full or partial workplace closures ([ILO, 2020](#)). Working from home (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 ([Bonacini, Gallo and Scicchitano, 2020](#)). It is noted that some recent studies have focused on WFH phenomenon because of its sudden growth of prominence, and there is increasing literature on the impacts of the pandemic on the labour market in different countries. While the WFH policies apply to both male and female workforces, it is expected the pandemic would disproportionately affect women compared to men ([Alon, et al., 2020](#)). Early evidence suggests 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](#); [Rapid Research Information Forum, 2020](#); [Reichelt, Makovi and Sargsyan, 2020](#)). Most of these studies asserted that this 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. With sample respondents in the US, Germany, and Singapore, [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 across the three countries. In the Australian context, the Australian Bureau of Statistics (ABS) has a range of new statistics on the economic, social, household, employment and industry impacts due to the pandemic. One of the key ABS statistic releases is the household impacts of COVID-19 survey series which mainly examine its impacts on jobs, hours worked, lifestyle and well-being of the general population on a fortnightly or monthly basis (ABS, 2020a). Changes in job situations have been widely reported in this series including changes in employment status, work location (i.e., WFH) and hours worked. In another study which examined the initial impacts of the pandemic using data collected from over 3000 Australians in April 2020, 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. Using a gender lens, Rapid Research Information Forum (2020) has reported early evidence that women in the science, technology, engineering and maths (STEM) workforce in Australia face disproportionate increases in caring responsibilities and disruptions to working hours, job security and paid work capacity, and that this situation is most acute for those with children under twelve. As for construction workforces who work in project-based setting, to the best of the authors' knowledge, there is no study that examined the impacts of the COVID-19 pandemic on their employment and other aspects of their overall livelihood. While the pandemic has made significant impacts across all workforces in the construction industry, and indeed people from all walks of life globally, the focus of this exploratory study is, however, on the women workforce in the Australian construction industry. They are minority group in the industry who have already faced barriers related to their career in pre-COVID era (Lingard and Francis, 2004; Oo, Liu and Lim, 2020).

The COVID-19 outbreak in Australia and construction businesses

As this exploratory study was conducted around six months into the COVID-19 pandemic, this review section highlights the key responses of the Australian government to the pandemic over this period. It can help shed light on the possible impacts on the pandemic on household, employment, industry and many other aspects of livelihood. In Australia, significant measures to limit the spread of COVID-19 were initiated in early February with the first travel restrictions. Following that, widespread physical distancing and isolation measures were progressively implemented from mid-March. The easing of restrictions in all states and territories were implemented from mid-May. Table 1 shows the key measures by the government between March and September 2020; and highlights the impacts of the pandemic on construction businesses (in italic font). Based on the findings in ABS's (2020b) survey on the impacts of COVID-19 on businesses in Australia, most construction businesses were operating as normal or under modified conditions during the pandemic period. Construction businesses have had faced different challenges including cash flow and reduced demand for product or services due to the pandemic. In addition, individual businesses had different perceptions and business sentiments on different aspects including business prospects, cash flow and financial commitments. It should be noted that this series of survey by ABS (2020b) has focussed on different topics in each monthly release to maintain relevance in a changing environment during the pandemic.

Research method

This exploratory study adopted a survey design in achieving the research objectives. It is an efficient research design to examine specific aspects of research interest of a given population. The targeted population is women workforce (i.e., professional women, tradeswomen and women labourers) in the Australian construction industry who are at least 18 years old. Data was collected using an online structured survey questionnaire to reach the prospective survey respondents based in different states and territories in

Table 1. The Australian government measures in response to COVID-19 pandemic and its impacts on construction businesses

Month (2020)	Key measures and impacts on construction businesses
March	<ul style="list-style-type: none"> • Introduction of international travel restrictions. • Shutting down of non-essential services (22 March). • First announcement of an economic stimulus package (12 March) • Social distancing rules and additional shutdown restrictions (20 to 30 March). • JobKeeper payment announcement (30 March). • <i>45% of businesses in construction reported that they had experienced adverse business impacts and 95% anticipated impacts over the coming months.</i>
April	<ul style="list-style-type: none"> • Free childcare for working parents (2 April). • Some states and territories announced learning from home arrangements for most school students. • <i>94% of businesses in construction were operating.</i> • <i>52% of businesses made changes to the work arrangements (reduced hours worked, changed work location -WFH, placed staff on paid leave).</i> • <i>74% of businesses in construction reported that reduction in demand for product and services had an adverse impact on operations.</i> • <i>77% of businesses in construction reported that reduced cash flow had an adverse impact on operations.</i> • <i>45% of businesses in construction reported that government restrictions had had an adverse impact on operations.</i> • <i>80% of businesses in construction had registered or intend to register for the JobKeeper Payment scheme.</i>
May	<ul style="list-style-type: none"> • Slight easing of restrictions in some states and territories (1 to 12 May). • Federal Government three-stage plan to begin easing restrictions (8 May). • Easing of restrictions in all states and territories from mid-May. • <i>35% of businesses in construction were operating as normal.</i> • <i>65% of businesses in construction were operating under modified conditions.</i>
June	<ul style="list-style-type: none"> • Easing of restrictions in all states and territories from mid-May. • <i>56% of businesses in construction reported that revenue had decreased compared to the same time last year.</i> • <i>46% of businesses in construction reported that their currently available cash on hand would support more than three months on operation.</i>
July	<ul style="list-style-type: none"> • Restrictions reinstated in regions of Victoria (1 July). • Free childcare for working parents ended (12 July). • <i>9% of businesses in construction experienced difficulties in negotiating changes to rates of pay.</i>
August	<ul style="list-style-type: none"> • Melbourne moved to stage 4 restrictions and regional Victoria moved to stage 3 (5 Aug). • <i>28.4% of businesses in construction expected difficulty in meeting financial commitments over the next three months.</i>

Table 1. continued

Month (2020)	Key measures and impacts on construction businesses
September	<ul style="list-style-type: none"> • Many states and territories were in the final stage of easing restrictions, but progress had slowed in some areas due to the situation in Victoria. • A roadmap for reopening restrictions in Victoria commenced from 13 September. • <i>33% of employing businesses in construction expected change in the number of hours worked by staff once COVID-19 restrictions are lifted and conditions stabilise.</i>

Source: [ABS \(2020a\)](#) Household impacts of COVID-19 survey; [ABS \(2020b\)](#) Business indicators, business impacts of COVID-19

Australia in a timely manner. The online survey link using the Qualtrics Survey platform was distributed via emails and social media by professional bodies and women's networks in construction between August and September 2020. Unfortunately, it was not possible to keep track of number of surveys sent because of the use of social media, and the researchers had no access to email address books of the supporting organizations. For the design of the survey questionnaire, the survey respondents were asked to indicate their job situations in terms of employment status, work location and working hours pre- and during the COVID pandemic. Noting that the WHO declared COVID-19 as pandemic on 11 March 2020 ([WHO, 2020a](#)), the measurements of job situations were thus based on four time points to enable an examination on the changes in the respondents' job situations, namely 1st week of February (pre-COVID time period), 1st week of April, 1st week of June and last working week at the time of completing the survey (during-COVID time periods). Open-ended questions were also included to explore the reasons for changes in job situations. Next, they were asked to indicate their perceptions of the impacts of the pandemic on their career aspects and job prospects in the industry, mainly using a 5-point Likert scale (for e.g., 1 = not at all and 5 = a great deal). With very limited or no literature on the impact of the pandemic on women in construction, the measurement items in the questionnaire were adapted from relevant studies on this subject matter (e.g., [ABS, 2020a](#); [Biddle, et al., 2020](#); [Rapid Research Information Forum, 2020](#)). In addition, the logic functions in Qualtrics were utilized to ensure the flow of questions for individual respondents considering the different characteristics and personal circumstances of the prospective respondents. In terms of analysis, a One-sample Kolmogorov-Smirnov test was performed to test on the normality of data of quantitative nature. The test results show that the observed variables failed the normality assumption, and thus non-parametric statistical tests were used for the data analysis. The first test is One-sample Wilcoxon Signed Rank test (i.e., the non-parametric equivalent of the one-sample t -test) for examining whether the sample median is equal to a test value of three (i.e., the mid-point of the five-point Likert scale). This test allows to test the hypothesis whether the respondents' perceptions on the measurement items are lower or greater than the neutral level. Next, Mann-Whitney U-test (i.e., the non-parametric equivalent of the two-sample t -test) was used for testing the difference in distribution of the respondents' perceptions between two groups of respondents according to their caring responsibilities and income support for their family. That is, the hypothesis whether there is statistical difference in distribution between the two groups of respondents. The qualitative responses from the open-ended questions, on the other hand, were analysed in identifying the key themes within the data.

Results and discussion

There were 102 sets of usable survey responses collected over a six-week period. While the number of responses is considerably low for a survey with its recruitment via professional bodies and women's networks

in construction, one important factor to consider is that the emergency of the COVID-19 pandemic has placed considerable strain on people from all walks of life globally. Indeed, there is a great interest among the respondents to obtain a copy of the research findings where more than 70% of the respondents have provided their email address for this purpose. This seemingly reflects their willingness and seriousness to share their experiences on a voluntary basis in the present study. Thus, their responses are useful to reveal some key insights on their employment in the industry during the pandemic times. Based on the respondents' self-classification of professions, 98 sets were completed by professional women, 4 sets by tradeswomen and there is no response from women labourers in the industry. With the very low number of responses from tradeswomen, the analysis was thus focussing on the 98 professional women working across different states and territories in Australia. [Table 2](#) show the demographic profiles of the respondents with the majority (70.4%) of them aged between 26 and 45 years old. A similar percentage of respondents were born in Australia. On level of education, the percentage of respondents with undergraduate and postgraduate degrees is as high as 82.6% (i.e., 81 out of 98). This finding echoes that of the latest Australian 2016 Census where number of people with undergraduate and postgraduate degree qualifications have

Table 2. The demographic profiles of the respondents

Profiles	Freq.	Percent
Age		
18 - 25	7	7.1
26 - 35	41	41.8
36 - 45	28	28.6
46 - 55	19	19.4
56 and above	3	3.1
Country of birth		
Australia	69	70.4
Overseas	29	29.6
Highest level of education		
Secondary	1	1.0
Certificate	6	6.1
Advanced Diploma/ Diploma	10	10.2
Undergraduate degree	50	51.0
Postgraduate degree	31	31.6
Your income is the primary source of support for your family		
Yes	53	54.1
No	45	45.9
Caring responsibilities		
Yes (parents, children and others)	40	40.8
No	58	59.2

increased significantly compared to year 2011, and the gap in educational attainment between men and women has narrowed in the past 10 years (ABS, 2017). In terms of family commitments, slightly more than half (54.1%) of the respondents were primary income earners in their family, and about 41% respondents have caring responsibilities. Overall, 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 association between the respondents' role as primary income earner and caring responsibilities was further examined in Table 3 using a cross tabulation. A Chi-square test of independence shows that there is no statistical significance association between their role as primary income earner and caring responsibilities (i.e., $\chi^2 = 0.026, p = 0.794$). This means those respondents who were primary income earners for their family may or may not have caring responsibilities, and vice versa. However, the cross-tabulation shows that there is a group of 21 respondents (i.e., 21.4% of total respondents) who were primary income earners and had caring responsibilities for their family. This prompts the need to investigate if there are significance differences in their perceptions of career aspects and job prospects in the subsequent analysis considering the responsibilities shouldered by this group of respondents.

Table 3. Cross-tabulation of the respondents' role as primary income earner and caring responsibilities

Income as the primary source of support for family	Caring responsibilities		Total
	Yes	No	
Yes	21	32	53 (54.1%)
No	19	26	45 (45.9%)
Total	40 (40.8%)	58 (59.2%)	98

Turning into the respondents' employment profiles, Table 4 shows that about a quarter (28.5%) of them have had up to five years of experience in the industry. The other major group (25.5%) was with between six and ten years of experience. Almost all respondents (94.9%) were employed at the time of survey and they worked across different Australian states and territories. The percentages of respondents who worked in the two major states of New South Wales and Victoria are 42.9% and 26.7%, respectively. About 65% of the respondents worked in an office environment before the pandemic, providing indicative evidence where women tend to be allocated with office-based tasks as reported in the literature (e.g., Ling and Poh, 2004; Lingard and Francis, 2004; Oo, Lim and Feng, 2020). Next, on their pre-tax annual income, as high as above 50% of the respondents earned above A\$ 100,000, and of these, close to 38% earned above A\$ 120,000. These income levels suggest that the respective respondents had a decent income based on a broad comparison to the full-time adult average weekly total earnings in Australia in May 2020 that was \$1,771.20 per week or \$92,102 annually (ABS, 2020c). Other than those preferred not to answer the question on their income level, the respective respondents with lower range income were either working part-time or casual as indicated in the changes of their employment status (see Figure 1).

CHANGES IN JOB SITUATIONS

Figure 1 shows the respondents' employment status, work location and working hour pre- and during the pandemic across the four time points using the 100% stack bar chart. In terms of employment status, it is heartening to note that most respondents were working full-time, part-time or casual during the pandemic times. On average, 96% of them were employed for the three time points during pandemic (i.e., 1st week of April till the time of survey). This could partly be explained by the fact that most construction businesses

Table 4. The employment profiles of the respondents

Profiles	Freq.	Percent
Years of experience in the industry		
Less than 1 year	2	2.0
1 - 5	26	26.5
6 - 10	25	25.5
11 - 15	16	16.3
16 - 20	12	12.2
21 - 25	9	9.2
25 and over	8	8.2
Current employment status		
Self-employed	3	3.1
Employed by an organization (private or public sector)	88	89.8
Family business	2	2.0
Do not have a paid job	5	5.1
Current job position		
Architect	7	7.5
QS/ Cost Engineer/ Cost Planner/ Estimator	11	11.8
Administrator/ Contract Administrator	13	14.0
Project Director/ Project Manager/ Construction Manager	18	19.4
Director/ Manager (Account, HR, Marketing, Business Mgmt)	23	24.7
Site Supervisor/ Site Engineer	8	8.6
Engineer (civil and building services)	9	9.7
Cadet/ Graduate positions	4	4.3
Current state or territory of workplace ^a		
NSW	45	42.9
QLD	12	11.4
VIC	28	26.7
ACT	10	9.5
NT	0	0.0
SA	4	3.8
WA	6	5.7
TAS	0	0.0

Table 4. continued

Profiles	Freq.	Percent
Workplace before the COVID-19 pandemic		
Office	65	66.3
Construction site	26	26.5
Others (office and construction site)	7	7.1
Current annual job income (before tax)		
41k - 60k	6	6.1
61k - 80k	13	13.3
81k - 100k	11	11.2
101k - 120k	14	14.3
121k and above	37	37.8
Prefer not to answer	12	12.2
Do not have a paid job	5	5.1

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

were operating during the pandemic period, and that 80% of businesses had registered or intend to register for the JobKeeper Payment scheme in April 2020 ([ABS, 2020a](#)). The JobKeeper Payment scheme is an Australian government subsidy for eligible businesses which have been significantly affected by the COVID-19 pandemic to continue paying their employees ([Australian Taxation Office, 2020](#)). However, a small number of respondents lost their job during the pandemic, ranging between 3 to 6%. Next, a more profound change has been found for work location during the pandemic times mainly due to the COVID lockdowns. According to the NSW government COVID safety plan ([2020](#)), employer must allow an employee to work at the person's place of residence where it is reasonably practicable to do so. Similarly, the [Department of Health and Human Services \(2020\)](#) in the Victoria state has the same advice for businesses who have employees WFH. The respondents who were WFH has increased significantly, from about 6% of respondents in the pre-COVID period to close to 55% in the 1st week of April. The percentages of WFH recorded for the subsequent two time points have reduced since increasing number of respondents had went back to normal workplace or worked partly in normal workplace and partly from home since 1st week of June following the easing of restrictions in all Australian states and territories from mid-May ([ABS, 2020b](#)). Indeed, the percentages of respondents who went back to normal workplace at the time of survey (between August and September 2020) is slightly more than half of the number recorded pre-COVID, which are 42.9% and 82.7%, respectively.

On the respondents' working hours, there were changes recorded for the three time points during the pandemic. On average, about 8.5% of the respondents worked less hours than usual for these three time points, which suggest that most respondents had not experienced large reductions in hours worked as reported in [Biddle, et al. \(2020\)](#) back in April. On the other hand, a much larger group of about one-third of the respondents had worked more hours than usual for these three time points, ranging between 27.6% and 34.7% of respondents for the same time periods. However, corresponding to changes noted for work location during these time points, the changes in working hours are less salient even though higher percentages of respondents had changed their work location. For example, in the 1st week of April, as high as 74.5% of respondents had changed their work location to either WFH or partly in normal workplace and

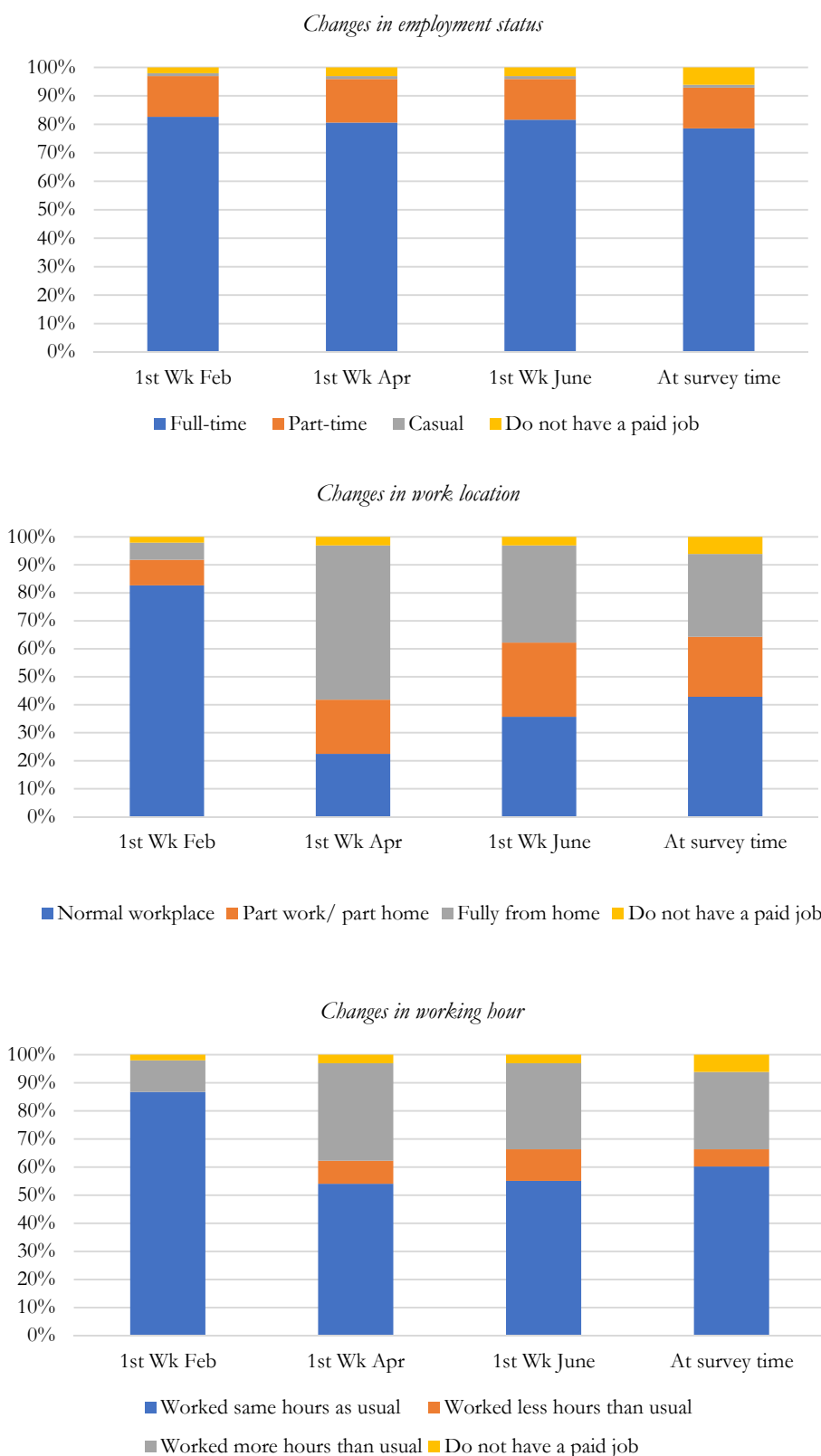


Figure 1. The respondents' employment status, work location and working hour pre- and during the COVID-19 pandemic

partly from home, and only 54.1% had worked same hours as usual despite the changes. The percentages of respondents who worked same hours as usual have also increased modestly from 1st week of June. This can partly be explained by the fact that increasing number of respondents had went back to normal workplace or worked partly in normal workplace and partly from home as reported earlier. It should also be noted that some respondents had indicated they had worked more hours than usual even in the pre-COVID period on the 1st week of February, which seemingly indicates the nature of jobs in the industry that require long working hours (Lingard and Francis, 2004; Lekchiri and Kamm, 2020). However, to further shed light on these changes in work location and working hour, the respondents were asked to indicate their reasons for not being able to WFH, and the reasons why they had been required to work less (or more) hours pre- and during the pandemic times as examined next.

Table 5 shows the reasons why the respondents were not able to work from home (partly or fully) during the pandemic time periods. There were given the ‘other, please specify’ option for this question and the additional reasons specified are shown in italic font. The most common cited reason is the nature of the job they had (i.e., 65.3% of the affected respondents). It is expected that the majority of these respondents had to work on construction sites and/or at their normal workplace in accessing the required resources. The next most cited reason is their employer not offering the option of WFH, which to some extent associated to the ‘workplace culture that discourages WFH’ specified by the respondents. It is hopefully that their employers of those affected have followed the guidelines on WFH issued by the authorities, especially their duty of care for the health and safety of their employees and others at the workplace that extends to identifying and managing the risks of exposure to the COVID-19 virus (NSW Government, 2020).

Table 5. The reasons why the respondents were not able to work from home (partly or fully) during the COVID-19 pandemic time periods

Reasons	Freq.*	Percent
The nature of job you had	49	65.3
Your employer not offering the option of working from home	12	16.0
Your home situation was not being conducive for work	6	8.0
Your home lacking access to the internet and other proper equipment	2	2.7
<i>Workplace culture that discourages working from home</i>	4	5.3
<i>Personal preference to work in the office</i>	2	2.7
Total	75	100.0

Given the high possibility of different reasons, the respondents were required to state the reasons why they had been required to work less (or more) hours than usual pre- and during the pandemic time periods in open-ended questions. It should be noted that some respondents had stated few reasons in their responses, and thus the frequency counts are differing from those reported in Figure 1. Their qualitative responses were analysed and tabulated in Table 6. The identified reasons can be broadly classified into job- and personal-related reasons. For the reported situation of working more hours than usual even in the pre-COVID pandemic period (see Figure 1), increased workload has been identified as the main reason. Some respondents had specifically mentioned the nature of the additional workload including the need to meet project deadline and they were working on new project and/or tender. These reasons are not likely to be associated with the COVID-19 pandemic. However, one respondent had stated that longer working hours was a strategic preparation of response to the COVID-19. It is noted that the outbreak was declared

a Public Health Emergency of International Concern in Jan 2020 ([WHO, 2020b](#)). During the pandemic times, on the other hand, most of the identified reasons are related to COVID-19, especially the identified personal-related reason where some respondents were home-schooling their children during the lock-down period. Indeed, the home-schooling responsibility has been identified as the only personal-related reason for (i) working less hours by taking time off from work, or (ii) more hours than usual while still working full-time hours during the pandemic time periods. In terms of job-related reasons, the main reason for working less hours among those affected is due to reduced workload following a downturn in business in their organization. For those who worked more hours than usual, by contrast, had claimed increased workload as the main reason (i.e., 33 out of 40 identified reasons). It is clear that most of the stated reasons for increased workload are associated with the pandemic and changes in work location with WFH arrangement, including additional managerial duties and coordination works, the need to cover for WFH colleagues with caring responsibilities, and reduction in staff numbers. Interestingly, there is a job-related reason that appears on both list of reasons for working less or more hours during the pandemic, i.e., improved work efficiency with less distraction. The respective respondents were able to better focus on their works following the change of work location and the stated reasons include less commuting time and interference from colleagues. Indeed, the respondents in [Baudot and Kelly \(2020\)](#) perceived improvements in their work productivity when working remotely during the COVID-19 lockdowns.

Table 6. The reasons why the respondents had been required to work less (or more) hours than usual pre- and during the COVID-19 pandemic time periods

Reasons	Freq.*	Percent
Pre-COVID-19		
<u>Working more hours</u>		
<i>Job-related reasons</i>		
Increased workload	6	35.3
Increased workload because of:		
The need to meet project deadline	6	35.3
New project and/or tender	4	23.5
Strategic preparation of response to the COVID-19	1	5.9
Total	17	100.0
During COVID-19 pandemic		
<u>Working less hours</u>		
<i>Job-related reasons</i>		
Pay cut with reduced working days	3	20.0
Asked to take leave	2	13.3
Improved work efficiency with less distraction	2	13.3
Reduced workload because of:		
Downturn in business	6	40.0
No interstate travel	1	6.7

Table 6. continued

Reasons	Freq.*	Percent
<i>Personal-related reasons</i>		
Home schooling of children	1	6.7
Total	15	100.0
<u>Working more hours</u>		
<i>Job-related reasons</i>		
Difference time zone with overseas project team members	1	2.5
Different time zone due to working remotely	1	2.5
Improved work efficiency with less distraction	1	2.5
Work stress to meet task deadline	2	5.0
Increased workload	2	5.0
Increased workload because of:		
Additional managerial duties due to WFH	6	15.0
New project and/or tender	5	12.5
Additional coordination works due to WFH	5	12.5
Reduction in staff numbers	4	10.0
The need to meet project deadline	4	10.0
Covered for WFH colleagues with caring responsibilities	2	5.0
Changes in job routines	1	2.5
Greater expectation on work output than usual	1	2.5
The need to be multi-tasking	1	2.5
To keep works on program under the COVID-19 conditions	1	2.5
Work shift arrangement	1	2.5
<i>Personal-related reasons</i>		
Home schooling of children	2	5.0
Total	40	100.0

* Only those respondents who were affected had been asked to respond to this question and some respondents have stated multiple reasons.

PERCEPTIONS OF CAREER ASPECTS AND JOB PROSPECTS

The respondents' perceptions of their career in the construction industry during the pandemic were examined in two parts. First, all respondents were asked about their perceptions of the impacts of the pandemic on different career aspects (Table 7). This was followed by questions for those who remained employed at the time of survey on their perceptions of their job prospects (Table 8). For the four measurement items (P1 to P4) in Table 7, the frequency distribution shows that most respondents (between

50 and 67.3%) perceived negative impacts of the pandemic are below the moderate level (i.e., the mid-point of the five-point Likert scale). It is also noted that the percentages of respondents at the extreme end of scale (i.e., 'a great deal' group) for P1 to P4 are all below 10% (ranging between 5 and 8.2%), signifying that only a small group of respondents perceived great potential negative impacts of the pandemic on their career aspects. This observation is consistent with the reported changes in which loss of job and pay cut with reduced working days had affected a small number of respondents only. While there is a rather widespread in the respondents' responses as demonstrated by the high standard deviations, the corresponding mean scores for all items are below the moderate level (i.e., below 3). Of these, their perceived negative impact on their pay and earnings (P2) recorded the lowest mean value of 1.99, which can be partly explained by its frequency distribution where as high as 52% of respondents had rated the pandemic had no impact on this measurement item at all. On the other hand, for those with caring responsibilities, their perceived negative impact on their capacity to engage in paid work activities due to caring responsibilities (P1) recorded the highest mean value of 2.60 as 75.0% of them rated the impact as slight-to-moderate. For further testing, the one-sample Wilcoxon Signed Rank test results show that the median values of all four items are statistically significantly below three. These findings provide strong evidence that the respondents were optimistic about the potential negative impacts of the pandemic on their capacity to engage in paid work activities due to caring responsibilities (P1, only for those who had caring responsibilities), pay or earnings (P2), job security (P3), and career progression and advancement (P4).

Among the 93 respondents who remained employed at the time of survey, [Table 8](#) shows that the frequency distributions of their perceptions of job prospects are rather mixed. Considering the responses of highest frequencies for the three measurement items, about 40% of respondents perceived it is unlikely that they would be losing job at some stage over the next 12-month (P5). While about one-third perceived it is likely they would not be able to find and accept a job that meet their job expectations if they were to lose their job at some stage over the next 12-month (P6), it is unlikely that they would leave their profession in the construction industry and work in other industries (P7). It is also noted a considerably percentage of respondents scored neutral for items P5 to P7, and this neutral group recorded the second highest frequencies for all three items. Next, while the corresponding mean scores for all three items are below the neutral level (i.e., below 3), the one-sample Wilcoxon Signed Rank test results show that only the median value of P5 are statistically significantly below three ($p < 0.05$). This seemingly suggests that the respondents were confident that they would be able to stay in their job in the next 12-month. It is indeed relieving to note the optimism among the respondents since it has been reported that Australian respondents in [Biddle, et al. \(2020\)](#) had very high job insecurity. For items P6 and P7 with the corresponding mean scores of 2.989 and 2.806 that are very close to 3 suggest that the respondents were neutral and uncertain about their job prospects at the time of survey if they were to lose their job at some stage over the next 12-month. This observation can largely be explained by the fact that the COVID-19 pandemic has presented unprecedented challenges and uncertainties to the world community.

[Table 9](#) shows the further analysis results in investigating if there are significant differences in the respondents' perceptions according to the grouping based on their role as primary income earner and career responsibilities. Item P1 has been excluded as it was only answered by the respondents who had caring responsibilities. The focus is on the group of 21 respondents who were primary income earners and had career responsibilities in their family (see [Table 3](#)) versus the remaining 'others' respondents. For both groups, there is a rather widespread in the respondents' responses as demonstrated by the high standard deviations. With the exception of item P6 (mean = 3.055) for 'others' group, the mean scores for all items in both groups are below the moderate or neutral level (i.e., below 3). This trend of descriptive statistics is consistent with the analysis that based on the total sample size (see [Tables 7](#) and [8](#)). Fortunately, the mean value of the perceived negative impact on pay and earnings (P2) for the 'carer and primary income earner' group (mean = 1.571) is considerably lower than those of the total sample (mean = 1.990, see [Table 7](#))

Table 7. The respondents' perceptions of the impacts of the COVID-19 pandemic on their career aspects

Perceptions	Frequency (%)					Mean	Std. Dev.	Sig. ^a
	Not at all	Slightly	Moderately	Considerably	A great deal			
P1 The extent to which COVID-19 pandemic negatively affected your capacity to engage in paid work activities due to your caring responsibilities (N = 40).	4 (10.0)	16 (40.0)	14 (35.0)	4 (10.0)	2 (5.0)	2.600	0.982	0.020
P2 The extent to which COVID-19 pandemic negatively affected your pay or earnings (N = 98).	51 (52.0)	15 (15.3)	20 (20.4)	6 (6.1)	6 (6.1)	1.990	1.239	0.000
P3 The extent to which COVID-19 pandemic negatively affected your job security (N = 98).	29 (29.6)	34 (34.7)	15 (15.3)	12 (12.2)	8 (8.2)	2.347	1.253	0.000
P4 The extent to which COVID-19 pandemic negatively affected your career progression and advancement (N = 98).	35 (35.7)	24 (24.5)	16 (16.3)	17 (17.3)	6 (6.1)	2.337	1.292	0.000

^a One-sample Wilcoxon Signed Rank test for median equals 3 (i.e., the mid-point level); scale: 1 to 5 (not at all to a great deal).

Table 8. The perceptions of respondents who remained employed on their job prospects

Perceptions	Frequency (%), Total N = 93					Mean	Std. Dev.	Sig. ^a
	Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely			
P5 The chances of you losing job at some stage over the next 12-month.	12 (12.9)	38 (40.9)	28 (30.1)	11 (11.8)	4 (4.3)	2.538	1.006	0.000
P6 If you were to lose your job at some stage over the next 12-month, the chances that the job you eventually find and accept would be able to meet your job expectations.	7 (7.5)	25 (26.9)	27 (29.0)	30 (32.3)	4 (4.3)	2.989	1.037	0.882
P7 If you were to lose your job at some stage over the next 12-month, the chances that you eventually leave your profession in the construction industry and work in other industries.	13 (14.0)	31 (33.3)	20 (21.5)	19 (20.4)	10 (10.8)	2.806	1.227	0.157

^a One-sample Wilcoxon Signed Rank test for median equals 3 (i.e., the mid-point level); scale: 1 to 5 (extremely unlikely to extremely likely).

and 'others' group (mean = 2.104). Given the responsibilities shouldered by this former group, it would be rather depressing if their pay and earnings have been badly impacted during the pandemic times. However, a further test using the Mann-Whitney U-test shows that there is no statistically significant difference in distribution between both groups for their perceptions of items P2 to P7 at $p < 0.05$ level. This could possibly be explained because the perceived negative impacts of the COVID-19 pandemic are modest among the respondents, even though some had greater family responsibilities.

Table 9. The respondents' perceptions according to grouping based on the respondents' role as primary income earner and caring responsibilities

Perceptions	Primary income earner with caring responsibility (N = 21)		Others		Sig. ^a
	Mean	Std. Dev.	Mean	Std. Dev.	
P2	1.571	1.028	2.104	1.273	0.072
P3	2.381	1.322	2.338	1.242	0.975
P4	2.381	1.532	2.325	1.229	0.868
	Primary income earner with caring responsibility and remained employed (N = 20)		Others		
P5	2.800	1.152	2.649	1.222	0.481
P6	2.750	1.251	3.055	0.970	0.231
P7	2.900	1.210	2.781	1.239	0.686

^a Mann-Whitney U-test for comparing two groups

Having found that there is no statistically significant difference in distribution according to the grouping, [Table 10](#) shows the correlation tests between the respondents' profile characteristics and their perceptions of career aspects and job prospects using the total sample. As expected, there is a positive correlation between age and years of experience in the industry ($r = 0.687, p < 0.01$). However, the results also show some interesting correlations between age and perceptions of job security (P3, $r = 0.200$) and chances of losing job (P5, $r = 0.199$). These positive correlations are statistically significant, suggesting that the perceived negative impacts of the pandemic on job security and chances of losing job increase with age. This may be explained because older workers experienced a sense of ontological precarity because of their worries about the long-term sustainability of their jobs, and there might be limited alternative sources of retirement income ([Lain, et al., 2019](#)). For women, [Lain, et al. \(2019\)](#) further pointed out that household circumstances play a role in their sense of precarity. However, while one's self-perceived job security is likely to vary across different institutional, economic, and cultural contexts, older workers may still be psychologically and socially less equipped than their younger counterparts to cope with the perceived threats of job loss ([Hank and Erlinghagen, 2010](#)).

The next statistically significant correlation is between education level and perception of pay or earnings (P2, $r = 0.244$). The results show the perceived negative impact of the pandemic on pay or earnings increase with education level. A plausible explanation is that people with a higher education level have higher income level ([Cuñado and de Gracia, 2012; Manna, et al., 2018](#)), and it is not surprising that they would be affected because of a pay cut and/ or salary freeze in response to the pandemic. It should be noted that it is not feasible to test the correlation between the education and income levels (as well as the perceptions

Table 10. Correlations between the respondents' profile characteristics and perceptions

	Age	Edu level	Yrs of exp.	P2	P3	P4	P5	P6	P7
Age	1.000								
Edu level	0.025	1.000							
Yrs of exp.	0.687**	-0.006	1.000						
P2	0.050	0.244*	-0.024	1.000					
P3	0.200*	0.154	0.049	0.496**	1.000				
P4	0.063	-0.061	0.051	0.305**	0.668**	1.000			
P5	0.199*	0.080	0.040	0.303**	0.715**	0.501**	1.000		
P6	0.036	0.060	0.108	-0.159	-0.133	-0.027	-0.140	1.000	
P7	0.024	-0.143	-0.234*	0.138	0.171	0.062	0.215*	-0.161	1.000

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

examined) here because about 12% of respondents preferred not to answer the question on their current annual job income (see [Table 4](#)). On the last profile characteristic – the respondents' years of experience in the industry, it has been found statistically negatively correlated with their perceived chances of leaving their profession in the construction industry and work in other industries if they were to lose their job at some stage over the next 12-month (P7, $r = -0.234$, $p < 0.05$). This suggests that the longer they are in the industry, the lower the likelihood of leaving the industry. Indeed, similar findings have been reported in [Morello, Issa and Franz \(2018\)](#) where women in older age groups were less likely to leave their construction career as compared to those in younger age groups. It is recognized that personal-related factors play an important role if women workforce would leave their construction careers ([Oo, Liu and Lim, 2020](#)). Turning into the correlations between the perceptions examined in this study, items P2, P3, P4 and P5 are all statistically correlated with each other positively. It follows that if the respondents perceived a greater negative impact of the pandemic on their career aspects (P2 to P4), they perceived the chances of losing job (P5) are higher, and vice versa. Of these, the positive correlations among perceived negative impacts of job security (P3), career progression and advancement (P4) and chances of losing job over the next 12-month (P5) are moderate to high (correlation coefficients are between 0.501 and 0.715). Lastly, on the correlations between perceptions of job prospects (P5 to P7), the only statistically significant correlation is between P5 and P7 which is rather weak ($r = 0.215$, $p < 0.05$). These insignificant (or weak) correlations can largely be explained by the neutral responses (and uncertainties) observed among the respondents in the descriptive statistics (see [Table 8](#)).

In summary, with no exception to women workforce in construction, changes and challenges in employment are inevitable under the measures enacted to contain the pandemic with reported loss of jobs and reductions in hours worked in the literature (e.g., [Biddle, et al., 2020](#); [Borland and Charlton, 2020](#)). Fortunately, while the respondents had experienced profound changes of work location and working hours, most were employed full-time at the time of survey (i.e., around six months into the pandemic). In addition, their perceived negative impacts of the pandemic are modest among the respondents, even though some had greater family responsibilities. Nonetheless, the exploratory study provides a critical insight on women's job situations in the industry during the pandemic. These findings have implications for human resource practices to better address the changes experienced by women workforce, especially with the reported

increased workload due to the COVID lockdowns with the need for WFH. Under the uncertainty about the duration of the pandemic and future contagion waves, the development of human resource protocols such as flexible working arrangements could better support women workforce now or in the future. It is noted that 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., [Bonacini, Gallo and Scicchitano, 2020](#); [Green, Tappin and Bentley, 2020](#); [Hite and McDonald, 2020](#)). This model may be an option for employing organizations in construction businesses, in addressing the challenges of retention of women workforce in the industry, which has always been challenging because of its entrenched gender stereotypes.

Conclusions

This exploratory study was conducted around six months into the COVID-19 pandemic. Majority of professional women participated in the study are with high level of education, and they were employed full-time in the construction industry and earned a decent income at the time of survey. The results show that there are changes to their job situations during the COVID-19 pandemic times, with more profound changes of work location and working hours among most of the respondents. These changes are mainly due to the COVID lockdowns with the need for WFH. A considerably large group of respondents indicated that they had worked more hours than usual during the pandemic due to job-related reasons associated with COVID-19. However, there are signs that increasing number of respondents had went back to normal workplace and worked same hours as usual between August and September 2020. In terms of their perceptions of career aspects and job prospects following the pandemic, the results show that there is no statistically significant difference between two groups of respondents who were grouped based on their role as primary income earner and had career responsibilities for their family. In general, the perceived negative impacts of the pandemic are modest among the respondents, even though some had greater family responsibilities. They were optimistic about the potential negative impacts of their pandemic on their career aspects, namely: capacity to engage in paid work activities due to caring responsibilities, pay or earnings, job security, and career progression and advancement. While the respondents seemingly appear to be confident in staying in their job in the next 12-month, they were uncertain about their job prospects in terms of (i) finding a job that meet their job expectations, and (ii) leaving their profession in the construction industry and work in other industries if they were to lose their job at some stage over the next 12-month. There are statistically significant associations between their profile characteristics (age, education level, and years of experience in the industry) and perceptions of some career aspects. These findings have implications for human resource practices to better address the changes experienced by women workforce in the industry that are associated with COVID-19. In particular, for the human resource practices that address their unique circumstances and challenges including childcare and home schooling of children. The respective practices help addressing the challenges and difficulties in retention of women workforce in the industry during and post COVID-19 pandemic.

There are limitations in this exploratory study given a small sample size. In addition, the focus here is on professional women in the industry, with insufficient or no responses from construction tradeswomen and women labourers to enable a more complete overview on the subjects of this study. It is learnt that recruitment of respondents to voluntarily participate in research is a very challenging and difficult task during the COVID-19 pandemic, notwithstanding the supports from professional bodies and women's networks in construction in the present study. Further studies should consider adopting different research design and data collection techniques to better reaching the respective groups of women workforce in the industry. Indeed, the COVID-19 pandemic affects different cohorts of workforce in the industry (regardless of gender), further study could thus consider focussing on different cohorts of interest. It is also recognized that there are challenges associated with the changes in job situations following the pandemic, and the

respective strategies adopted in overcoming the challenges. This could be a potential area for further studies to explore on the challenges and strategies in responding to the COVID-19 pandemic.

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