

## Article

# Organisational Interventions for Improving Mental Health of Project Management Practitioners during COVID-19 in Architecture, Engineering and Construction Sectors in Australia

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**Abstract:** The introduction of COVID-19-related psychosocial risks to the Australian architecture, engineering and construction (AEC) project organisation has triggered the development of innovative organisational interventions for mitigating the risks and promoting of positive mental health among project management (PM) practitioners. Therefore, the paper aims to explore the COVID-19-related organisational interventions for improving mental health in the AEC project organisation. Through a comprehensive literature review, 20 organisation interventions were retrieved, and an online expert forum was conducted with nine industry experts. The results of the expert opinion confirmed the 20 organisational interventions identified from the literature. Moreover, the organisational interventions were used to develop a questionnaire survey distributed among PM practitioners via convenient sampling. Mean score ranking analysis was used to analyse the survey responses from 58 participants. The research findings show that the identified organisational interventions are important, but are ranked differently by architecture, engineering and construction sectors based on their importance in promoting mental health.

**Keywords:** mental health; organisational interventions; project management practitioners; architecture, engineering and construction (AEC); Australia



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## 1. Introduction

The project management environment is nefarious for poor mental health due to the complexity and dynamism involved in the management of projects [1,2]. Schedule management, cost management, risk management and project methodologies are some of the core project management practices that expose PM practitioners to poor mental health in the architecture, engineering and construction (AEC) project organisations in Australia [3–5]. The demand to meet up with tight project schedules, stringent project budgets and project risk management resulted in poor mental health among PM practitioners [6]. Poor mental health negatively impacts productivity, well-being and project performance, which makes it a significant occupational health concern in project management [7,8].

Owing to the proliferation of poor mental health among PM practitioners in the AEC project organisation, several studies have been conducted to examine the organisational interventions for addressing mental health. For instance, Love and Edwards [9] reported that organisational support is an intervention for improving project managers' mental health. In another study, company management systems including project management and staff management institutions were established as organisational interventions to mitigate burnout among construction project professionals [3]. Tijani, Jin [10] found that

project organisational elements, including knowledge management, integrated project delivery and project governance positively correlate with the mental health of project managers in the AEC project organisation.

The emergence of the novel coronavirus pandemic outbreak, COVID-19, in late-March 2020 in Australia has challenged the traditional organisational interventions for the mental health of PM practitioners in the AEC firm because of the introduction of COVID-19-related psychosocial risks that required innovative organisational interventions capturing the COVID-19-related psychosocial risks. Despite the urgent need to develop organisational interventions for mental health during the COVID-19 era, it is surprising that there is a scarcity of studies focusing on interventions in the AEC firm for promoting positive mental health. Hence, this study aims to identify and analyse organisational interventions during COVID-19 for the promotion of positive mental health among PM practitioners in the AEC project organisation in Australia.

## 2. Literature Review

### 2.1. Mental Health

Over the last couple of decades, there has been a disagreement among scholars on the conceptualisation of mental health in the workplace. Some consider the absence of work stress or mental illness as good mental health among workers, while others regard good mental health as a possession of a sense of well-being and a meaningful life [11]. Kamardeen and Sunindijo [12] conceptualised mental health to comprise anxiety, depression and stress. Nevertheless, substantial empirical evidence has criticised the assumption that an absence of mental illness is equivalent to a mentally healthy workplace [13,14].

Given the criticism regarding the definition of mental health as the absence of mental illness, mental health should be redefined as a positive sense of well-being and an underlying belief in others' dignity and worth [15]. Moreover, Al-Maskari, Shah [16] defined mental health as the 'state of well-being in which every individual realizes his or her own potential, can cope with the normal stress of life, can work productively and fruitfully, and is able to make a contribution to her or his community'. Mental health is crucial for the health of workers and positively influences the onset of mental illness, physical problems and the recovery process. In a working environment, mental health has a positive relationship with job satisfaction [17].

### 2.2. Organisational Interventions

Organisational interventions refer to as planned, behavioural and theoretical-based actions designed to change work design through structure, policies, management, culture, roles and tasks to reduce psychosocial risk and improve the mental health of the workforce [18]. Organisational interventions are proactive approaches for improving individual mental health and organisational outcomes, such as workers turnover, sickness absence and productivity [19,20]. Theoretically, organisational intervention is underpinned by the concept of organisational change as it views interventions as the process of changing the state of the organisation from one state to another through several planned steps [18,21].

The resurgence of COVID-19-related psychosocial risks demands the altering of work design by changing organisation elements, such as processes, structure and programme to improve mental health of workers [19,22]. The organisational interventions alleviate COVID-19-related psychosocial risks to promote positive mental health [23]. In relation to AEC project organisations, organisational interventions alleviate the psychosocial risks introduced by COVID-19 to the project environment to improve mental health [24]. The organisational interventions specifically targeted project organisation due to differences in the general workplace and project environment.

The operationalisation of a construct is crucial to confirm the measurement items for designing data collection instruments. Critical literature reviews and expert forums have shown various items for measuring organisational interventions. In this study, organisa-

tional interventions were operationalised into 20 measurement items, presented in Table 1. The measurement items were codified from COOPM 1 to COOPM 20.

**Table 1.** Operationalisation of organisational interventions.

Code	Organisational Interventions	References
COOPM 1	Providing support for working remotely.	[25–27]
COOPM 2	Providing flexible work schedules.	[25,28,29]
COOPM 3	Providing training on how to detect and manage stress.	[30]
COOPM 4	Providing training on how to enhance the use technologies of for project delivery.	[31,32]
COOPM 5	Establishing a system to maintain effective communication.	[33]
COOPM 6	Providing routine COVID-19 screening.	[34,35]
COOPM 7	Regularly disinfecting the project workplace.	[28,34]
COOPM 8	Enforcing the use of personal protective equipment.	[28]
COOPM 9	Providing additional childcare support.	[34]
COOPM 10	Providing training on how to manage and balance work and family.	[26,29]
COOPM 11	Providing unlimited access to self-care apps.	[30,34]
COOPM 12	Hiring additional PM practitioners to distribute project workload.	[30]
COOPM 13	Offering specific pandemic-related leaves.	[34]
COOPM 14	Providing Employee Assistance Program.	[34]
COOPM 15	Providing additional technical facilities for virtual and remote work.	[26]
COOPM 16	Encouraging the sharing of ideas and suggestions to improve project delivery.	[36]
COOPM 17	Encouraging the adoption of non-tradition project delivery methodologies.	[36]
COOPM 18	Taking additional measures to manage the supply chain of materials.	[37,38]
COOPM 19	Managing and maintaining collaboration between PM practitioners and stakeholders.	[36]
COOPM 20	Providing additional PM training.	[25]

### 3. Research Methodology

#### 3.1. Research Design

An exploratory sequential research design was adopted for this study due to the aim of the research, which calls for the development of organisational interventions for improving the mental health of PM practitioners in the AEC project organisation during the COVID-19 era. The research design is because of the limited studies and measuring instruments for COVID-19-related organisational interventions for mental health in the AEC project organisation. Owing to exploratory sequential research design, a literature review was initially conducted, followed by an online expert forum and then the development of a survey for the collection of data from PM practitioners. These three approaches were integrated to collect relevant information on organisational interventions for mental health.

#### 3.2. Literature Review Process

Given the scanty studies on COVID-19-related organisational interventions influencing the mental health of PM practitioners in the AEC project organisation, a comprehensive literature review was conducted to reveal COVID-19-related organisational interventions from high-risk industries. A literature review is one of the effective methodologies for understanding the current state of the arts of a topic [39]. A three-stage approach was adopted for the literature review process. In stage 1, highly reputable journals, conferences and government documents were searched through Scopus, Web of Science and government websites. Stage 2 involved a visual examination of the retrieved journals, conference papers and government documents in stage 1 to remove irrelevant documents. Out of the

50 journals, conference papers and government documents retrieved from stage 1, 35 were recovered for further examination after visualisation of the abstract of the documents. Further, an in-depth reading of the 35 journals, conference papers and government documents was carried out in the stage 3. By doing that, 21 relevant journals, 1 conference paper and 2 government documents were found relevant to this study. The review of the documents identified the COVID-19-related organisational interventions influencing the mental health.

### 3.3. Expert Opinion Method

The expert opinion method is a method of collecting reliable information from experts on a certain subject [40]. It offers validity and reliability of the research when it is mandatory to gather evidence of the research [41,42]. Hence, the opinion of competent experts on the subject matter underpinned the basis for embracing serious discussion, including implementation of innovation recommended by experts in order to obtain the relevant results [42,43]. Generally, the process seeks judgement by selected experts through brainstorming, which mitigates some of the expected bias. Moreover, careful selection of experts determines the reliable outcomes of the expert opinion method. In this research, the identified on COVID-19-related organisational interventions from the literature review were subjected to expert opinion for further analysis.

### 3.4. Selection Process for Expert Opinion

As recommended by [44], a two-step process was involved in the selection of experts from the project management industry to contribute to the identification of COVID-19-related psychosocial risk and organisational interventions.

In the first step of the selection process, the industry experts, which consisted of PM practitioners, were chosen from the researchers' network of professionals. As is typical of expert opinion method, the sampling method involved was convenience sampling; therefore, inference to the whole of the Australian AEC industry population might be limited. Through the researchers' network of professionals, a list of 9 potential experts was created. This number of experts is sufficient as the minimum number of experts required is 7 [45].

In the second step of the selection process, an email was sent to the 9 experts who gave their consent to participate in the research. The email requested information concerning their qualifications, education, project management experience and professional membership. The consent form and project participant information sheet were also attached to the email to seek their consent. The aim of requesting this information is to establish whether the contacted experts are qualified to provide information on COVID-19-related psychosocial risk and organisational interventions.

Table 2 presents the profiles of the experts who were involved in the expert forum.

### 3.5. Online Expert Opinion

A questionnaire survey was designed as a data collection instrument as part of the expert opinion process. The survey aims to collect information from the expert panel concerning the COVID-19-related organisational interventions related to the mental health of PM practitioners in the AEC project organisation. Before sending the questionnaire to experts, the questionnaire was piloted with four individuals (two from academics and two from industry) who were not selected on the expert forums.

The experts were asked to suggest the applicability of the identified the COVID-19-related organisational interventions in the literature in the AEC project organisation. Moreover, the experts were given the opportunity to include additional factors that were not added to the survey. Moreover, all the 20 identified organisational interventions identified from the literature were considered applicable to the mental health of PM practitioners in the AEC project organisation without any addition.

**Table 2.** Profile of the experts.

	Education	Sector	PM-Oriented Work Experience	Number of Projects Managed	Professional Membership
EXP 1	Master's degree	Engineering	16 years above	21 projects above	PMI
EXP 2	Master's degree	Construction	6 years	16 projects	AIPM
EXP 3	Master's degree	Construction	16 years above	10 projects	Not disclosed
EXP 4	Master's degree	Construction	16 years above	20 projects	Not disclosed
EXP 5	Diploma	Construction	10 years	11 projects	Not disclosed
EXP 6	Master's degree	Construction	11 years	6 projects	AIPM and PMI
EXP 7	Master's degree	Engineering	16 years above	21 projects above	Not disclosed
EXP 8	Master's degree	Architecture and Construction	16 years above	21 projects above	AIPM
EXP 9	Master's degree	Engineering	16 years above	21 projects or above	AIPM

### 3.6. Questionnaire Survey Development

To obtain a broader opinion from the PM practitioners, the 20 COVID-19-related organisational intervention practices identified through the combination of a literature review and expert opinion were used to design a questionnaire survey. The questionnaire consists of two sections. The first section included respondents' demographic information (e.g., educational qualification, work experience, project-related experience) and the second section covered information on COVID-19-related organisational interventions. Accordingly, respondents were asked to indicate the level of agreement using a five-point Likert scale (between 1 = strongly disagree and 5 = strongly agree) for each item found in the section.

### 3.7. Validity and Reliability of the Survey

Content validity of the questionnaire was established on the basis that the measurement items regarding COVID-19-related organisational intervention practices are underpinned by both literature review and expert opinion. Face validity of the questionnaire was established through a pilot study in which the data collection instrument was sent to experts through an email to identify problems concerning the wordings of the questions, appropriateness of the questions in relation to AEC projects and evaluation of the completion time. Three experts with 5 years in project management and one associate professor in project management with 5 publications in mental health were involved in the pilot study.

The reliability of the questionnaire can be confirmed with variables showing Cronbach's alpha values greater than 0.7 [46]. The reliability of the measurement items for COVID-19-related organisational interventions was evaluated and generated Cronbach's alpha values of 0.967.

### 3.8. Sampling and Data Collection

Convenience sampling was selected in recruiting PM practitioners to provide reliable information on the mental health in the AEC project organisation during COVID-19. The sampling method was chosen because of the time frame of the research and easiness of accessing the respondents. Further, there is an absence of construction associations registered on the numbers of AEC firms in Australia; therefore, the selection of convenience sampling is appropriate for this research.

Of the 200 online surveys distributed among AEC firms in Australia, 58 valid responses were received with a response rate of 29%. This sample size is sufficient for this research. Furthermore, ref. [47] proposed that for convenient sampling, sample sizes larger than 30 and less than 500 are appropriate for most research. Similar studies, includ-

ing [48,49] used sample sizes less than 40 for convenience sampling strategy in their empirical studies, indicating the appropriateness of low sample size in convenience sampling.

#### 4. Data Analysis

##### 4.1. Profile of the Respondents

The profile of the respondents who completed the questionnaire is presented in Table 3. Most respondents have completed 1–5 projects (51.7%), and the least have completed 11–15 projects and 16–20 projects (6.9%). Most of the participants had project management (PM)-oriented work experience of 16 years or above (48.3%), and the minority of them had 11–15 years (12.1%). Most respondents completed a Master’s degree (32.8%) and the minority of them had a vocational education certificate (1.7%).

**Table 3.** Respondents’ profile.

Characteristics	Frequency	Percentage
<i>Number of projects worked during COVID-19</i>		
1–5 projects	30	51.7
6–10 projects	20	34.5
11–15 projects	4	6.9
16–20 projects	4	6.9
<i>Gender</i>		
Male	45	77.6
Female	13	22.4
<i>Background education</i>		
High school	2	3.4
Vocational education	1	1.7
Diploma	6	10.3
Bachelor’s degree	18	31.0
Master’s degree	19	32.8
Doctoral degree	12	20.7
<i>Respondent’s experience in PM-oriented work</i>		
0–5 years	11	18.9
6–10 years	12	20.7
11–15 years	7	12.1
16 years or above	28	48.3
Total	58	100

##### 4.2. Expert Forum Result and Analysis

Table 4 depicts the result of the expert forum that established the applicability of the organisational interventions revealed from the literature. In total, 20 organisational interventions were considered adequate to improve the mental health of PM practitioners in the AEC project organisation.

##### 4.3. Mean Score Ranking

Mean score ranking analysis was conducted to determine the mean values and ranking of each organisational intervention in the AEC project organisation. The analysis commenced by presenting the tables for coding the measurement items for organisational interventions, followed by tables presenting the mean values and ranking of the constructs furnished by the architecture, engineering and construction sectors. Table 5 shows the coding for organisational interventions. Table 5 illustrates the mean score analysis and rankings for each organisational intervention in the AEC project organisation. Overall, the mean scores indicate that the organisational interventions ranged between 2.16 and 3.29. As shown in Table 5, the mean value furnished by the architecture sector ranged from 2.00 to 3.40, whereas the mean values provided by the engineering and construction sectors ranged from 2.33 to 2.83 and 2.05 to 3.44, respectively. It has been found that the top three organisational interventions for improving PM practitioners’ mental health during COVID-19 are “Hiring additional PM practitioners to distribute project workload”

(COOPM 12), “Providing training on how to balance work and family” (COOPM 10) and “Providing additional childcare supports” (COOPM 9). However, “Hiring additional PM practitioners to distribute project workload” (COOPM 12) is shown to be the most highly ranked organisational intervention across the architecture and construction sectors, and the second highest ranked intervention in the engineering sector. Moreover, “Providing training on how to balance work and family” (COOPM 10) was ranked eighth by the architecture sector, fifth by the engineering sector and second by the construction sector.

**Table 4.** Result of experts on organisational interventions.

Organisational Interventions	Expert								
	1	2	3	4	5	6	7	8	9
1. Offering support to PM practitioners who worked remotely during COVID-19 period.	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Providing flexible work schedules to promote social distancing during COVID-19 period	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Providing training on how to detect and manage stress during COVID-19 period.	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Providing training on how to enhance the use of technologies for project delivery during COVID-19 period	✓	✓	X	✓	✓	✓	✓	✓	✓
5. Establishing a system to maintain effective communication between PM practitioners, project teams, leadership and stakeholders during COVID-19 period.	✓	✓	X	✓	✓	✓	✓	✓	✓
6. Providing routine COVID-19 screening to PM practitioners	✓	✓	✓	✓	✓	✓	✓	✓	X
7. Regularly disinfecting the project workplace environment during COVID-19 period.	✓	✓	X	✓	✓	✓	✓	✓	X
8. Enforcing the use of personal protective equipment in the project environment during COVID-19 period.	✓	✓	✓	✓	X	✓	✓	✓	✓
9. Providing additional childcare supports for PM practitioners during COVID-19 period.	X	✓	✓	X	✓	✓	✓	✓	✓
10. Providing training on how to manage and balance work and family during COVID-19 period.	X	✓	✓	✓	✓	✓	✓	X	✓
11. Providing unlimited access to self-care apps for mental health and psychological support (e.g., digital mental health app and or therapy) to PM practitioners during COVID-19 period.	✓	✓	✓	✓	✓	✓	✓	✓	✓
12. Hiring additional PM practitioners to distribute project workload during COVID-19 period.	✓	✓	X	✓	X	✓	✓	✓	✓
13. Offering specific pandemic-related leaves (e.g., vaccination leave, leave for self-isolation) for PM practitioners COVID-19 during the project delivery.	✓	✓	✓	✓	✓	✓	✓	✓	✓
14. Providing Employee Assistance Program (EAP) to help alleviate the distress associated with work-family conflict during COVID-19 period.	✓	✓	X	✓	✓	✓	✓	✓	✓
15. Providing additional technical facilities for virtual and remote work during COVID-19 period.	✓	✓	X	X	X	✓	✓	✓	✓
16. Encouraging PM practitioners to share ideas and suggestions to improve project delivery during COVID-19 period.	✓	✓	✓	✓	X	✓	✓	✓	✓
17. Encouraging the adoption of agile PM methodologies to promote autonomy, social interactions and breaking down of project activities in various phases during COVID-19 period.	✓	✓	X	✓	✓	X	✓	X	X
18. Taking additional measures to manage the supply chain of materials for project delivery.	✓	✓	✓	✓	X	X	✓	X	✓
19. Managing and maintaining collaboration between PM practitioners and stakeholders during COVID-19 period.	✓	✓	X	✓	X	✓	✓	X	✓
20. Providing additional PM training (e.g., quality management, budget management and time management) during COVID-19.	✓	✓	X	✓	X	✓	✓	X	X

Note: ✓ = Applicable; X = Not applicable.

**Table 5.** Mean score ranking for organisational interventions.

Code	Architecture			Engineering			Construction			Total		
	Mean	S.D.	Rank	Mean	S.D.	Rank	Mean	S.D.	Rank	Mean	S.D.	Rank
COOPM 1	2.40	1.140	15	2.42	0.900	16	2.05	1.161	20	2.16	1.105	20
COOPM 2	2.00	0.707	20	2.33	0.778	19	2.22	1.151	18	2.22	1.044	19
COOPM 3	2.80	1.483	5	2.50	1.087	12	2.85	1.295	5	2.78	1.257	5
COOPM 4	2.60	1.517	9	2.50	0.798	13	2.66	1.237	9	2.62	1.167	9
COOPM 5	2.40	1.673	13	2.50	0.798	14	2.46	1.075	14	2.47	1.063	15
COOPM 6	2.60	1.140	12	2.67	0.651	7	2.66	1.217	10	2.66	1.101	8
COOPM 7	2.20	1.304	18	2.67	0.651	8	2.44	1.246	15	2.47	1.143	16
COOPM 8	2.40	0.894	17	2.25	0.622	20	2.20	1.145	19	2.22	1.027	18
COOPM 9	2.40	0.894	16	2.50	0.674	15	3.12	1.208	3	2.93	1.122	3
COOPM 10	2.60	1.517	8	2.67	1.073	5	3.12	1.249	2	2.98	1.235	2
COOPM 11	3.00	1.414	3	2.75	0.965	3	2.87	1.189	4	2.85	1.145	4
COOPM 12	3.40	1.517	1	2.75	1.055	2	3.44	1.324	1	3.29	1.298	1
COOPM 13	2.80	1.483	6	2.75	0.965	4	2.51	1.247	12	2.59	1.200	11
COOPM 14	3.00	1.414	2	2.83	1.115	1	2.41	1.204	16	2.55	1.202	12
COOPM 15	2.80	1.483	4	2.58	0.900	9	2.49	1.186	13	2.53	1.143	13
COOPM 16	2.80	1.140	7	2.33	0.778	18	2.68	1.150	8	2.62	1.105	10
COOPM 17	2.60	1.140	11	2.67	0.888	6	2.80	1.188	6	2.76	1.113	6
COOPM 18	2.40	1.342	14	2.42	0.793	17	2.56	1.097	11	2.52	1.047	14
COOPM 19	2.20	0.837	19	2.58	0.669	11	2.29	1.006	17	2.34	0.928	17
COOPM 20	2.60	1.517	10	2.58	0.900	10	2.78	1.235	7	2.72	1.182	7

In contrast, the bottom three organisational interventions in the AEC project organisation are “Enforcing the use of personal protective equipment” (COOPM 8), “Providing support for working remotely” (COOPM 1) and “Provide flexible work schedule to promote social distance during COVID period” (COOPM 2).

#### 4.4. Discussion

The above result established that “Hiring additional PM practitioners to distribute project workload” (COOPM 12), “Providing training on how to balance work and family” (COOPM 10) and “Providing additional childcare supports” (COOPM 9) are the top three ranked organisational interventions for promoting positive mental health among PM practitioners. These findings are consistent with previous studies, refs. [50–52] that confirmed that the provision of adequate staff, implementation of work-life balance policy and family support mitigates work stress among workforces. Moreover, ref. [53] argued that management interventions including work-life balance initiatives and workload management are effective for improving workplace mental health.

Furthermore, “Providing additional childcare supports” (COOPM 9) was positioned at sixteenth, fifteenth and third position in architecture, engineering and construction sectors, respectively. The differences in ranking can be attributed to the project complexity and organisational size, which influence the development of organisation interventions for mental health. This is consistent with the findings of Martin, Karanika-Murray [54] and Parker, Van den Broeck [55] that established the negative impact of company size and organisational design on workplace mental health interventions.

Inconsistent with extant studies [56,57], this study reported that “Enforcing the use of personal protective equipment” (COOPM 8), “Providing support for working remotely” (COOPM 1) and “Provide flexible work schedule to promote social distance during COVID period” (COOPM 2) are the bottom three organisational interventions in the AEC project organisations. A considerable amount of research revealed that remote work and social distance are critical for the improvement of mental health during COVID-19 [57–59]. The inconsistency in the findings can be attributed to the differences in working environments, as previous studies focused on general workplaces, while this study focused on

a projected-oriented environment with multiple organisations working concurrently to achieve project goals.

## 5. Conclusions

The study investigated the organisational interventions for the improving mental health of PM practitioners in the AEC project organisation during the COVID-19 era through the combination of a literature review, expert opinion and a question survey. The results of the literature review and expert opinion established 20 organisational interventions for positive mental health. This study further explored the perception of respondents from the three sectors (architecture, engineering and construction sectors) on the identified organisational interventions. Through the questionnaire survey, data on organisational interventions for mental health were gathered from 58 PM practitioners from architecture, engineering and construction sectors in Australia. A mean score ranking analysis on the 58 responses reveals that the highest-ranking organisational interventions by the architecture, engineering and construction sectors were “Hiring additional PM practitioners to distribute project workload” (COOPM 12), “Providing training on how to balance work and family” (COOPM 10) and “Providing additional childcare supports” (COOPM 9). and the least ranking interventions by them were “Enforcing the use of personal protective equipment” (COOPM 8), “Providing support for working remotely” (COOPM 1) and “Provide flexible work schedule to promote social distance during COVID period” (COOPM 2).

This study has certain limitations, which do not impede the research outcome. First, the sample size is low due to disruption caused by COVID-19. Although the sample size is sufficient for this study based on the established response rate for questionnaire the survey. Future studies should employ large samples to validate the findings.

Theoretically, this study contributes to the body of literature by confirming COVID-19-related organisation interventions and their related importance in promoting positive mental health among PM practitioners in the AEC project organisation. It further supports job demand resource theory by establishing that organisational resources mitigate work stress. Moreover, the practical implication of the study is that AEC sectors should implement and promote COVID-19-related interventions, including “Hiring additional PM practitioners to distribute project workload” (COOPM 12), “Providing training on how to balance work and family” (COOPM 10) and “Providing additional childcare supports” (COOPM 9) to tackle work stress.

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## References

1. Tijani, B.; Jin, X.; Osei-Kyei, R. Theoretical model for mental health management of project management practitioners in architecture, engineering and construction (AEC) project organizations. *Eng. Constr. Archit. Manag.* **2023**, *30*, 914–943. [[CrossRef](#)]
2. Pinto, J.K.; Dawood, S.; Pinto, M.B. Project management and burnout: Implications of the Demand–Control–Support model on project-based work. *Int. J. Proj. Manag.* **2014**, *32*, 578–589. [[CrossRef](#)]
3. Yang, F.; Li, X.; Zhu, Y.; Li, Y.; Wu, C. Job burnout of construction project managers in China: A cross-sectional analysis. *Int. J. Proj. Manag.* **2017**, *35*, 1272–1287. [[CrossRef](#)]
4. Gustavsson, T.K. Organizing to avoid project overload: The use and risks of narrowing strategies in multi-project practice. *Int. J. Proj. Manag.* **2016**, *34*, 94–101. [[CrossRef](#)]
5. Tijani, B.; Falana, J.N.; Jin, X.; Osei-Kyei, R. Suicide in the construction industry: Literature review. *Int. J. Constr. Manag.* **2023**, *10*, 1684–1693. [[CrossRef](#)]
6. Yang, F.; Li, X.; Song, Z.; Li, Y.; Zhu, Y. Job Burnout of Construction Project Managers: Considering the Role of Organizational Justice. *J. Constr. Eng. Manag.* **2018**, *144*, 04018103. [[CrossRef](#)]
7. Delisle, J. Working time in multi-project settings: How project workers manage work overload. *Int. J. Proj. Manag.* **2020**, *38*, 419–428. [[CrossRef](#)]
8. Leung, M.Y.; Chan, I.Y.; Olomolaiye, P. Impact of stress on the performance of construction project managers. *J. Constr. Eng. Manag.* **2008**, *134*, 644–652. [[CrossRef](#)]
9. Love, P.E.; Edwards, D.J. Taking the pulse of UK construction project managers' health: Influence of job demands, job control and social support on psychological wellbeing. *Eng. Constr. Archit. Manag.* **2005**, *12*, 88–101. [[CrossRef](#)]
10. Tijani, B.; Jin, X.; Osei-Kyei, R. Effect of project organization elements on the mental health of project management practitioner in AEC projects. *Eng. Constr. Archit. Manag.* **2022**. [[CrossRef](#)]
11. Ryff, C.D.; Love, G.C.; Urry, H.L.; Muller, D.; Rosenkranz, M.A.; Friedman, E.M.; Davidson, R.J. Psychological Well-Being and Ill-Being: Do They Have Distinct or Mirrored Biological Correlates? *Psychother. Psychosom.* **2006**, *75*, 85–95. [[CrossRef](#)] [[PubMed](#)]
12. Kamardeen, I.; Sunindijo, R.Y. Personal Characteristics Moderate Work Stress in Construction Professionals. *J. Constr. Eng. Manag.* **2017**, *143*, 1–10. [[CrossRef](#)]
13. Bowen, P.; Govender, R.; Edwards, P. Structural equation modeling of occupational stress in the construction industry. *J. Constr. Eng. Manag.* **2014**, *140*, 04014042. [[CrossRef](#)]
14. Keyes, C.L.; Martin, C.C. The Complete State Model of Mental Health. In *Wellbeing, Recovery and Mental Health*; Jarden, A., Oades, L., Slade, M., Eds.; Cambridge University Press: Cambridge, UK, 2017; pp. 86–98.
15. Leung, M.Y.; Chan, I.Y. Exploring stressors of Hong Kong expatriate construction professionals in Mainland China: Focus group study. *J. Constr. Eng. Manag.* **2012**, *138*, 78–88. [[CrossRef](#)]
16. Al-Maskari, F.; Shah, S.M.; Al-Sharhan, R.; Al-Haj, E.; Al-Kaabi, K.; Khonji, D.; Schneider, J.D.; Nagelkerke, N.J.; Bernsen, R.M. Prevalence of depression and suicidal behaviors among male migrant workers in United Arab Emirates. *J. Immigr. Minor. Health* **2011**, *13*, 1027–1032. [[CrossRef](#)]
17. Meliá, J.L.; Becerril, M. Psychosocial sources of stress and burnout in the construction sector: A structural equation model. *Psicothema* **2007**, *19*, 679–686.
18. Naghieh, A.; Montgomery, P.; Bonell, C.P.; Thompson, M.; Aber, J.L. Organisational interventions for improving wellbeing and reducing work-related stress in teachers. *Cochrane Database Syst. Rev.* **2015**. [[CrossRef](#)] [[PubMed](#)]
19. Mousa, M.; Boyle, J.; Skouteris, H.; Mullins, A.K.; Currie, G.; Riach, K.; Teede, H.J. Advancing women in healthcare leadership: A systematic review and meta-synthesis of multi-sector evidence on organisational interventions. *EClinicalMedicine* **2021**, *39*, 101084. [[CrossRef](#)] [[PubMed](#)]
20. Rickard, G.; Lenthall, S.; Dollard, M.; Opie, T.; Knight, S.; Dunn, S.; Wakerman, J.; MacLeod, M.; Seiler, J.; Brewster-Webb, D. Organisational intervention to reduce occupational stress and turnover in hospital nurses in the Northern Territory, Australia. *Collegian* **2012**, *19*, 211–221. [[CrossRef](#)]
21. Bambra, C.; Gibson, M.; Sowden, A.; Wright, K.; Whitehead, M.; Petticrew, M. Working for health? Evidence from systematic reviews on the effects on health and health inequalities of organisational changes to the psychosocial work environment. *Prev. Med.* **2009**, *48*, 454–461. [[CrossRef](#)]
22. Giménez-Espert, M.d.C.; Prado-Gascó, V.; Soto-Rubio, A. Psychosocial risks, work engagement, and job satisfaction of nurses during COVID-19 pandemic. *Front. Public Health* **2020**, *8*, 566896. [[CrossRef](#)] [[PubMed](#)]
23. Chirico, F.; Ferrari, G. Role of the workplace in implementing mental health interventions for high-risk groups among the working age population after the COVID-19 pandemic. *J. Health Soc. Sci.* **2021**, *6*, 145–150.
24. Borg, N.; Scott-Young, C.M.; Naderpajouh, N.; Borg, J. Surviving adversity: Personal and career resilience in the AEC industry during the COVID-19 pandemic. *Constr. Manag. Econ.* **2023**, *41*, 361–378. [[CrossRef](#)]
25. Pamidimukkala, A.; Kermanshachi, S. Impact of COVID-19 on field and office workforce in construction industry. *Proj. Leadersh. Soc.* **2021**, *2*, 100018. [[CrossRef](#)]

26. Kniffin, K.M.; Narayanan, J.; Anseel, F.; Antonakis, J.; Ashford, S.P.; Bakker, A.B.; Bamberger, P.; Bapuji, H.; Bhawe, D.P.; Choi, V.K. COVID-19 and the workplace: Implications, issues, and insights for future research and action. *Am. Psychol.* **2021**, *76*, 63. [CrossRef] [PubMed]
27. Hamouche, S. COVID-19 and employees' mental health: Stressors, moderators and agenda for organizational actions. *Emerald Open Res.* **2020**, *2*, 15. [CrossRef]
28. World Health Organization; International Labour Organisation Office. *Preventing and Mitigating COVID-19 at Work*; World Health Organization: Geneva, Switzerland, 2021.
29. Alsharaf, A.; Banerjee, S.; Uddin, S.; Albert, A.; Jaselskis, E. Early impacts of the COVID-19 pandemic on the United States construction industry. *Int. J. Environ. Res. Public Health* **2021**, *18*, 1559. [CrossRef]
30. Deloitte Development LLC. *COVID-19 Workforce Strategies for a Post-COVID-19 Recovery Workbook*; Deloitte Development LLC: Toronto, ON, Canada, 2020.
31. Firm, T.P. Here's How COVID-19 Is Changing the Construction Industry. Available online: <https://www.perecman.com/blog/2020/may/heres-how-covid-19-is-changing-theconstruction/> (accessed on 10 October 2022).
32. Raoufi, M.; Fayek, A.R. Identifying actions to control and mitigate the effects of the COVID-19 Pandemic on construction Organizations: Preliminary Findings. *Public Work. Manag. Policy* **2021**, *26*, 47–55. [CrossRef]
33. Safapour, E.; Kermanshachi, S.; Kamalirad, S. Analysis of effective project-based communication components within primary stakeholders in construction industry. *Built Environ. Proj. Asset Manag.* **2020**, *11*, 157–173. [CrossRef]
34. McKinsey & Company. *Reopening Workplaces: A Collection of Workforce-Protection Interventions*; McKinsey & Company: New York, NY, USA, 2020.
35. Stiles, S.; Golightly, D.; Ryan, B. Impact of COVID-19 on health and safety in the construction sector. *Hum. Factors Ergon. Manuf. Serv. Ind.* **2021**, *31*, 425–437. [CrossRef]
36. Koch, J.; Schermuly, C.C. Managing the Crisis: How COVID-19 Demands Interact with Agile Project Management in Predicting Employee Exhaustion. *Br. J. Manag.* **2021**, *32*, 1265–1283. [CrossRef]
37. Sharma, K.; Deng, L.; Noguez, C.C. Field investigation on the performance of building structures during the 25 April 2015, Gorkha earthquake in Nepal. *Eng. Struct.* **2016**, *121*, 61–74. [CrossRef]
38. Stephany, F.; Stoehr, N.; Darius, P.; Neuhäuser, L.; Teutloff, O.; Braesemann, F. The CoRisk-Index: A data-mining approach to identify industry-specific risk assessments related to COVID-19 in real-time. *arXiv* **2020**, arXiv:2003.12432. [CrossRef]
39. Li, Z.; Shen, G.Q.; Xue, X. Critical review of the research on the management of prefabrication construction. *Habitat Int.* **2014**, *43*, 240–249. [CrossRef]
40. Hallowell, M.R.; Gambatese, J.A. Qualitative research: Application of the Delphi method to CEM research. *J. Constr. Eng. Manag.* **2010**, *136*, 99–107. [CrossRef]
41. Bogner, A.; Littig, B.; Menz, W. Introduction: Expert interviews—An introduction to a new methodological debate. In *Interviewing Experts*; Springer: Berlin/Heidelberg, Germany, 2009; pp. 1–13.
42. Cuhls, K. Delphi surveys. In *Proceedings of Teaching Material for UNIDO Foresight Seminars*; United Nations Industrial Development Organization: Vienna, Austria, 2005.
43. Iriste, S.; Katane, I. Expertise as a research method in education. *Rural Environ. Educ. Pers.* **2018**, *11*, 74–80.
44. Karakhan, A.A.; Gambatese, J.A.; Simmons, D.R.; Al-Bayati, A.J. Identifying pertinent indicators for assessing and fostering diversity, equity, and inclusion of the construction workforce. *J. Manag. Eng.* **2021**, *37*, 04020114. [CrossRef]
45. Linstone, H.A. The Delphi Technique. In *Environmental Impact Assessment, Technology Assessment, and Risk Analysis. NATO ASI Series*; Covello, V.T., Mumpower, J.L., Stallen, P.J.M., Uppuluri, V.R.R., Eds.; Springer: Berlin/Heidelberg, Germany, 1985; Volume 4.
46. Hair, J.; Black, W.; Babin, B.; Anderson, R.; Tatham, R. *Multivariate Data Analysis*, 8th ed.; Cengage Learning: Berlin/Heidelberg, Germany, 2019; Volume 5.
47. Sekaran, U.; Bougie, R. *Research Methods for Business: A Skill Building Approach*; John Wiley & Sons: Hoboken, NJ, USA, 2016.
48. Peterson, R.A.; Merunka, D.R. Convenience samples of college students and research reproducibility. *J. Bus. Res.* **2014**, *67*, 1035–1041. [CrossRef]
49. Winton, B.G.; Sabol, M.A. A multi-group analysis of convenience samples: Free, cheap, friendly, and fancy sources. *Int. J. Soc. Res. Methodol.* **2022**, *25*, 861–876. [CrossRef]
50. Tetrick, L.E.; Winslow, C.J. Workplace stress management interventions and health promotion. *Annu. Rev. Organ. Psychol. Organ. Behav.* **2015**, *2*, 583–603. [CrossRef]
51. Cox, T.; Karanika, M.; Griffiths, A.; Houdmont, J. Evaluating organizational-level work stress interventions: Beyond traditional methods. *Work. Stress* **2007**, *21*, 348–362. [CrossRef]
52. Bhui, K.; Dinos, S.; Galant-Miecznikowska, M.; de Jongh, B.; Stansfeld, S. Perceptions of work stress causes and effective interventions in employees working in public, private and non-governmental organisations: A qualitative study. *BJPsych Bull.* **2016**, *40*, 318–325. [CrossRef] [PubMed]
53. Ohadomere, O.; Ogamba, I.K. Management-led interventions for workplace stress and mental health of academic staff in higher education: A systematic review. *J. Ment. Health Train. Educ. Pract.* **2021**, *16*, 67–82. [CrossRef]

54. Martin, A.; Karanika-Murray, M.; Biron, C.; Sanderson, K. The Psychosocial Work Environment, Employee Mental Health and Organizational Interventions: Improving Research and practice by taking a multilevel Approach. *Stress Health* **2016**, *32*, 201–215. [[CrossRef](#)] [[PubMed](#)]
55. Parker, S.; Van den Broeck, A.; Holman, D. Work design influences: A synthesis of multilevel factors that affect the design of jobs. *Acad. Manag. Ann.* **2017**, *11*, 267–308. [[CrossRef](#)]
56. Ingusci, E.; Signore, F.; Giancaspro, M.L.; Manuti, A.; Molino, M.; Russo, V.; Zito, M.; Cortese, C.G. Workload, techno overload, and behavioral stress during COVID-19 emergency: The role of job crafting in remote workers. *Front. Psychol.* **2021**, *12*, 655148. [[CrossRef](#)] [[PubMed](#)]
57. Galanti, T.; Guidetti, G.; Mazzei, E.; Zappalà, S.; Toscano, F. Work from home during the COVID-19 outbreak: The impact on employees' remote work productivity, engagement, and stress. *J. Occup. Environ. Med.* **2021**, *63*, e426. [[CrossRef](#)]
58. Rutkowska, A. Remote Interventions to Support Students' Psychological Well-Being during the COVID-19 Pandemic: A Narrative Review of Recent Approaches. *Int. J. Environ. Res. Public Health* **2022**, *19*, 14040. [[CrossRef](#)]
59. Chang, C.-H.; Shao, R.; Wang, M.; Baker, N.M. Workplace interventions in response to COVID-19: An occupational health psychology perspective. *Occup. Health Sci.* **2021**, *5*, 1–23. [[CrossRef](#)]

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