Title: The Potential for Workplaces to Provide Social Support for Distressed Infrastructure Workers

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Abstract: Infrastructure workers experience high rates of psychological distress and suicide. Social capital (e.g., co-workers, friends, family) and social support (e.g., emotional, practical, informational) help to minimise distress. This study explores how social capital and social support contribute to psychological distress and if accessing social capital to provide social support is different for distressed compared to non-distressed workers. A sample of 220 infrastructure workers recruited online from Canada, the United Kingdom, and the United States of America was used to explore social capital (sum and diversity) along with social support, and who workers would approach first when requiring a specific type of social support. It found that increased social capital was associated with higher distress, whereas lower social support was associated with higher distress. The primary contribution of this research indicates that although distressed infrastructure workers have more social capital available, they may not be obtaining the necessary social support needed from their networks. Also, as some distressed workers indicated they approach work colleagues to receive some types of social support, there may be an opportunity for workplaces to provide social support to co-workers to alleviate the gap in support and help improve psychological well-being.

Keywords: infrastructure workers, mental health, social capital, social support

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The Potential for Workplaces to Provide Social Support for Distressed Infrastructure Workers

Infrastructure industries (such as construction, mining, and energy) are reporting high rates of suicide in their workforce. To elaborate, in Australia, the suicide ratio for infrastructure workers is 25.6 deaths per 100,000 people, compared to all other industries whose rate is 13.4 deaths per 100,000 (Milner, 2016). The suicide rate reported in the United Kingdom for infrastructure workers is as high as three times the national average (Office for National Statistics, 2017). For workers in the United States, the rate is reported at 53.2 deaths per 100,000 (Peterson et al., 2018; Peterson et al., 2020) along with high rates of distress and suicide ideation for these workers (Dong et al., 2022). Additionally, the World Health Organization (2014) reports that men are 1.9 times more likely to commit suicide than women (p. 17). These high rates, coupled with substantially high costs associated with suicide and suicide attempts for the industry, place pressure to address the factors that contribute to psychological distress to ensure workplaces are safe and productive. To illustrate, in Australia alone, it is estimated that suicide and implications arising from suicide attempts, costs the construction industry approximately AU$1.57 billion per year (Doran et al., 2016).

To understand the factors related to psychological distress in the construction industry, Chan et al. (2020) reported a range of environmental, individual, and organisational influences that were important workplace contributors. This included low job control, high job demand, increased work hazards, lack of work-life balance, and little workplace support. Chan and colleagues (2020) also noted that coping strategies adopted such as alcohol and substance use often increase psychological distress. Further, Langdon and Sawang (2018) found construction workers engaged in very few positive coping strategies to help mitigate their experiences of distress. While Love et al. (2010) reported that having work support available (like having work colleagues available to help when needed) did help to reduce the experience of workplace stress and improve psychological well-being. This indicates that a range of mitigating workplace interventions is needed to help support those workers who might be experiencing psychological distress.

In examining the mechanisms used to address psychological distress in construction workers, Nwaogu et al. (2022) noted the need for workplaces to consider a three tiered intervention approach. This approach considers the *environmental* conditions (primary intervention e.g., reduce workplace demands), *individual* support (secondary intervention e.g., build resilience or coping), or provision of *treatment* (tertiary) to help improve well-being (e.g., providing counselling or using employee assistance programs). It is argued that an organisation must address each level to successfully manage psychological distress within the industry. Importantly, Nwaogu et al. (2022) stated the individual mechanisms focusing solely on promoting coping and building resilience were not effective alone at helping to reduce stress for construction workers. This indicates that workplaces could explore how to leverage the provision of social support from co-workers (indicated as important by Love and colleagues, 2010) to assist with addressing these individual mitigating factors. One way to achieve this is to potentially utilise work colleagues as a source of social capital to provide social support, to help boost this secondary tier to enable successful workplace intervention.

Therefore, the aim of this study is to investigate the levels of social capital (social capital being defined as a source that is available such as family, friends, work colleagues, etc) and the scope of social support (being defined as what is received or perceived as being available from the capital which can include emotional, practical, informational, or companionship forms of assistance or care) that can be provided to infrastructure workers. This study will also assess whether any variations in capital or support might exist for those workers that are experiencing distress. The contributions of this study are threefold. First, the study contributes to the existing literature on social capital and social support by focusing on a specific population: infrastructure workers. This group has been identified as having high suicide rates, making it crucial to understand the factors affecting their psychological well-being. By analysing the amount of social capital and the extent of social support received by these workers, the study sheds light on the unique challenges faced by this population.

Second, the study's focus on identifying gaps in social capital and social support based on the level of psychological distress further expands our understanding of the role these factors play in mental health. By understanding weaknesses or gaps in the available social capital and support provisions, the study provides a solid foundation for assisting to develop targeted interventions to address the specific needs of workers experiencing distress. Third, by considering the interplay between social capital, social support, and psychological distress, the study contributes to the development of more effective strategies for promoting the psychological well-being of workers in the industry. The outcome of identifying these factors will help build individual support (secondary intervention support) in the workplace by targeting any identified weaknesses in their levels (or type) of social capital that is available, and/or differences in the provision of social support for these workers. It is hoped by understanding all three intervention approaches can help to better support psychological well-being of infrastructure workers and help to address the high suicide rates currently experienced by the industry.

Social Capital and Distress

Social capital is the availability of a source (e.g., family member, friend, work colleague) that can provide a resource (e.g., a type of support such as emotional or practical) when needed (Adler & Kwon, 2002; Claridge, 2020). The recruitment and use of social capital to provide a type of social support when needed, is one mechanism that is effective at increasing well-being (Adler & Kwon, 2002; Claridge, 2020). Measurements of social capital can include counting the total number of people available, along with assessing the diversity (the different categories/types/groups of people available such as friends, family, professionals, work colleagues), and examining the extent to which an individual is embedded (connected or involved) with their social capital (e.g., see Adler & Kwon, 2002; Claridge, 2020; Kawachi, 2006; Kawachi et al., 2008). Further assessments of social capital can also measure the extent of the cognitive components (understanding creation and sustainment of relationships and exchanges), the structural components (e.g., using sociograms and network analysis to understand the means in which knowledge or resources are accessed), bonding (examination of shared identity or relationships of

similar persons), bridging (relationships with dissimilar others), and linking (relationships that occur at different levels of hierarchy) which increases complexity and challenges in measurement and analysis of social capital (Claridge, 2020; Kawachi, 2001; Poecze & Strauss, 2020).

It is argued that larger amounts (total sum) and more diversity tends to promote better well-being (Bourdieu, 1985; Xue et al., 2020). In contrast however, Portes (1998) states that increases in social capital (i.e., higher or more capital) may be associated with increases in distress. It is suggested that having a larger network places increased demands and expectations on multiple friendships, increases the level of engagement within the networks, and places excess pressure on managing multiple (and varied) relationships. It was proposed that too many friends may unnecessarily burden an individual and contribute to (rather than reduce) distress and impact negatively on well-being (Ennis & Bunting, 2013; Pillai et al., 2017). Further, Offer (2021) and Offer and Fischer (2018) propose that some connections may have a maladaptive impact on well-being, meaning some relationships may encourage negative health behaviours (or practices). Subsequently, these connections place increased or difficult demands on the relationship which has negative social and emotional consequences.

It has been further recognised that difficult connections are often likely to be close to the individual (e.g., partners or family members). Interestingly, Langdon et al. (2023) reported that some distressed construction workers did not seek emotional support from their partners, but did seek support from their work colleagues. This is also consistent with earlier work by Love et al. (2010) who reported support received from work colleagues helped to minimise distress. These findings suggest that while an individual may have a social capital connection available within their network to provide support, they may not be utilising these sources.

There appears to be some contentions in the literature, this being that too little social capital indicates a smaller pool of resources (in terms of sum and diversity) are available to access support when needed (e.g., Bourdieu, 1985). Whereas Portes (1998) suggests that having too much (or larger) social capital means an individual may be stretched too thin trying to engage with their capital. However, the

evidence also indicates that some social capital sources (such as a partners or family members) may be perceived as a burden on an individual which is likely to increase or add to their distress (Offer, 2021; Offer & Fischer, 2018). On the other hand, Langdon et al. (2023) and Love et al. (2010) indicate infrastructure workers seek support from work colleagues, suggesting they may be a beneficial source of social capital to provide social support if/when needed. Therefore, evaluating which sources of social capital can be accessed to provide social support may help identify whether there are sources that are more (or less) likely to be accessed for a worker experiencing psychological distress, leading to the following research questions:

RQ1: What is the association between social capital (in terms of sum and diversity) on distress for infrastructure workers?

RQ2: Are any sources of social capital in particular related to distress?

Social Support and Distress

Social support is a benefit available (or perceived to be available) from a person's social contacts (i.e., their social capital). Social support measures identify four main types of support: (1) *emotional* such as empathy, love, or compassion/caring; (2) *tangible* (also known as instrumental or practical support) such as lending money, providing care or assistance; (3) *informational* such as providing advice or information on a problem or issue that is being experienced; and (4) *companionship* which covers involvement in social activities or spending time with someone (Cohen et al., 2000; Cohen & Wills, 1985; House, 1981; Thoits, 2011).

Importantly, it is recognised that social support may help to mitigate suicide risk for workers within the construction industry (Milner et al., 2017). Considering construction work and associated working conditions are often characterised by high risk and dangerous work, social support available (e.g., from colleagues) can decrease the negative outcomes associated with working in this industry (Van den Broeck et al., 2017). Van den Broeck and colleagues (2017) noted the importance of social support as an emerging critical factor for improving infrastructure worker distress, however they also

recognised that one of the measures used in their study (2-items) had low reliability. Because of this, Van den Broeck and colleagues (2017) indicated further exploration of the role of social support was needed to understand how social support at work helps improve worker well-being.

Other research has reported that an absence of social support from supervisors contributed to increases in depression for construction workers. Furthermore it was suggested that social support received from work colleagues (i.e., peers) did not help with minimising depression (Boschman et al., 2013). This conflicts with previous claims about the positive impact of support received from work colleagues (e.g., from Love et al., 2010). Upon further investigation, it was found that Boschman and colleagues (2013) examined the perceived relationship between the respondent and work colleagues, rather than what type of social support was received specifically. An example of the item assessing social support asks "is the relationship with your colleagues good?" (Boschman et al., 2013, p. 750). Boschman and colleagues (2013) are thus assessing a subjective relationship with their work-colleagues, rather than assessing the support received (or support that might be needed). Therefore, the current research is designed to understand how different types of social support (e.g., emotional, tangible, informational, and companionship) impact on distress for workers.

Finally, a pilot study by Langdon and colleagues (2023) indicated that for construction workers, a larger network overall with more diversity was associated with less psychological distress. Further, they indicated that low emotional support (above all other types of social support) was a key difference in the networks of distressed construction workers. They also found that there were some distressed construction workers who reported that they did not use their partner as a primary source when needing emotional support. However, it was acknowledged that because of the size of the sample (due to being a pilot study) there was not enough data to conclude on the importance of a partner in providing emotional support for distressed workers. Subsequently, this research will explore further if there is a difference in the sources of social capital that are accessed first when social support is needed. The following questions are also generated for this research:

RQ3: What is the relation between social support and distress for infrastructure workers?

RQ4: Which sources of social capital do distressed infrastructure workers access to fulfill a social support need?

The Current Study

The current study is interested in examining the impact of social capital and social support on psychological distress for infrastructure workers. Further it is interested in exploring which sources of social capital are accessed for provision of different types of social support needs. Understanding if any differences exist in relation to the sum (total number available) and diversity (number of different categories of relationships) of the social capital for workers, along with the availability or access to social support may help to identify opportunities in providing targeted (or specific) support for those experiencing distress. It is hoped that by examining and learning about social capital and social support and their relationship with psychological distress for workers can help to identify and implement workplace interventions to better support distressed workers. Combined, this knowledge may help to address the high rates of suicide currently experienced within the infrastructure industry by understanding these protective factors.

Considering this, the current research will focus on examining the components of social support that are perceived to be available and accessible. Additionally, it will examine the structural details about the number and type resources available at the individual level. This information can be used to understand how social capital and social support is accessed by distressed and non-distressed workers. This knowledge can be used to help workplaces develop strategies to target the tiers of support identified as important by Nwaogu and colleagues (2022). Further, this study will explore how different types of support can be accessed, and through who they are accessed (social capital). This study thus aims to help workplaces understand if social support can be leveraged to minimise worker distress. The research questions are summarised here:

RQ1: What is the relationship between social capital (in terms of sum and diversity) on distress for infrastructure workers?

RQ2: Are any sources of social capital in particular related to distress?

RQ3: What is the relation between social support and distress for infrastructure workers?

RQ4: Which sources of social capital do distressed infrastructure workers access to fulfill a social support need?

Method

An international cross-sectional study was designed to understand how infrastructure worker social support and social capital impacts on worker distress (ethical clearance was obtained from the University Human Research Ethics Committee of Queensland University of Technology, approval number 1700001028). Using regression analyses controlling for gender, age, years worked in industry, and years worked for current company this study evaluates social capital (sum and diversity), social support (comprising of emotional, tangible, informational and companionship), and psychological distress. The use of an online survey method was adopted to draw data from a pool of construction workers from multiple countries to ensure a broad and representative sample of infrastructure workers. This method was selected to ensure that a diverse population workers and used statistical checks to ensure no significant differences existed between the variables between countries to ensure data robustness.

Participants

A sample of 220 infrastructure workers aged from 18 – 73 ($M = 34.58$, $SD = 10.17$) who identified they had worked in the industry for at least 6 months was used. Workers were recruited online between May – June 2020 via Amazon Mechanical Turk (MTurk). MTurk provides access to participants from various backgrounds, locations, and demographics. This diversity helps to increase the generalisability of research findings. Despite concerns about data quality, multiple studies have shown that the data obtained from MTurk is reliable and comparable to data gathered through traditional

methods (Buhrmester et al., 2011). Of these workers, 159 were male (72%) and the sample was limited to participants registered in Canada (n = 44), United Kingdom (n = 31), and United States of America (n = 146).

Materials

Psychological Distress (Kessler-10)

The Kessler-10 (K10) is 10-items assessing symptoms related to psychological distress with good reliability (α =.92) and validity (Kessler et al., 2002; Kessler et al., 2010). Distress is measured on a five-point Likert scale (1 = *none of the time* to 5 = *all of the time*). Items are summed higher scores indicate higher distress and workers were categorised into two groups: 1) not distressed using the likely to be well/normal (score between 10-19), and 2) distressed by combining those who scored mild distress (score between 20-24), moderate distress (score between 25-29) and severe distress (score between 30-50; Andrews & Slade, 2001).

Social Support

The ENRICHD Social Support Instrument (ESSI) is a 7-item scale (however item-7 "do you live with a spouse?" yes/no was removed due to low reliability) leaving 6-items assessing perceived social support (emotional, informational, practical/tangible, structural/companion). ESSI scores are calculated by summing, where higher scores indicate higher support and has good internal consistency (α = .86), reliability, and convergent and discriminant validity (Gottlieb & Bergen, 2010; Mitchell et al., 2003). It is measured using a 5-point Likert scale where 0 = *none of the time* to 4 = *all of the time.*

First contact (social capital) for seeking support. The ESSI was adapted to measure the primary source social capital providing each of the social support items. After each social support item (from the ESSI) using the protocol from the International Social Survey Programme (ISSP) social networks questionnaire (Milne et al., 2017) an additional item was added '*For the above, select who you would turn to first?'.* Options were: partner, close family member, distant family member, close friend, work colleague, neighbour, sporting/social group member, class member, someone else, or no-one.

Social Capital

Cohen et al. (1997) developed the social network index (SNI) to measure social capital. It elicits respondents social contacts across 12 relationship types (Cohen et al., 1997).The scale assesses the sum, diversity, and an indicator of integration. The social capital categories are (1) spouse; (2) children; (3) parents; (4) parent in-laws; (5) other close relatives; (6) friends; (7) religious affiliations; (8) classes (e.g., school, university, adult education); (9) work; (10) neighbours; (11) volunteer activities; (12) other groups without religious affiliations. Total sum is calculated by summing the total number of people identified as having regular contact (at least once every two weeks either face to face or via telephone). Social capital is scored using the identified regular contacts from 0 (*do not see or talk with, at least once every two weeks*) to 7 (*7 or more*) giving a minimum score for social capital as 0 and maximum score across all domains of 68 (spouse [1] + both parents [2] + both in-laws [2] + nominated 7 or more in contact across the remaining 9 domains [63]). Network diversity (variability in types of social capital nominated for the different categories of relationships) according to Cohen and colleagues (1997) is calculated if there is at least one nomination for regular contact within each domain. The maximum score for diversity is 12 (at least one nomination for spouse, children, parents, parent-in-laws, siblings, other close relatives, friends, community groups, classes, work, neighbours, volunteer activities).

Procedure

Using MTurk, participants were recruited and offered $1.00 for completion. To minimise completion by non-infrastructure workers several mechanisms were employed such as confirmation checks, selecting their industry from a list of options (including health, banking/finance, education, warehousing, none of these/other). Finally cross-referencing if the selected occupation matched an infrastructure industry with exclusions applied for non-matched occupation/industry (e.g., occupation listed as plasterer but selected rail industry).

The first block collected the demographic and industry data. The second block collected the social support measures, followed by the modified question “who do you turn to first” (see materials section

for explanation). Next presented the social network index, followed by the K10. Upon completion of the survey items, a randomly generated code was used for participants to enter into the survey and any data that did not contain the code (e.g., entered text such as "thank you") was discarded.

Results

The data by industry type is presented in Table 1 along with the mean K10 (distress) scores by industry indicating that there was a significant difference related to distress based on industry type $F(5, 214) = 3.53$, $p = .004$, and post-hoc analyses with Bonferroni correction of $p < .01$ indicated that only rail had significantly lower distress $t(214) = 3.53$, $p = .007$ compared to residential construction and all other comparisons were non-significant. This finding may be due to the small sample size for rail workers included in this data and to ensure robustness, data analysis will use bootstrapping based on 10,000 sample. There was no significant differences based on distress between any of the countries $F(2, 217) = 0.84$, $p = .432$ with the majority of the sample (43%) scoring in the normal range, 14.5% in the mild range, 13% in the moderate range, and 29.5% in the severe range for psychological distress.

Table 1. Psychological Distress by Industry Type

			Psychological Distress (K10)	
Industry	*n*	%	*M*	*SD*
Residential construction	61	27.7	21.64	9.16
Energy	51	23.2	23.04	10.33
Commercial construction	46	20.9	26.15	9.23
Civil construction	37	16.8	24.05	8.89
Mining	14	6.4	27.29	9.79
Rail	11	5.0	15.09	5.15
Country				
Canada	44	20.0	22.93	7.80
United Kingdom	31	14.1	21.48	8.35
United States of America	145	65.9	23.87	10.28

Note. $N = 220$.

Descriptive data including the bivariate correlations between variables used in this analysis along with Cronbach's alpha is provided in Table 2. The items used to create the social support scale had initial poor goodness of fit, where item-4 "someone to help with daily chores" (i.e., assessing practical support) showing low standardised covariance of .22. Subsequently item-4 was removed from the scale, which improved the overall model $\chi^2 = 16.83$, CMIN 3.37, CFI .98, RMSEA < .001. Evaluation of the statistically significant correlations indicate a moderate negative relationship between social support and psychological distress (higher support, lower distress). Psychological distress had significant but low positive relationship with social capital and network diversity (variety, supporting Portes, 1998). Female workers had significantly higher social capital (weak), diversity (moderate), and distress (weak). Expected correlations included the high positive correlations between age with years worked in the industry and years with current company, subsequently these variables are used as controls in the regression analyses. Further expected positive correlations included social capital and network diversity (expected as they are derived from the same scale), with scale reliability also good.

Table 2. Bivariate Correlation Matrix

	Measure	*M*	*SD*	1	2	3	4	5	6	7	8
1	Gender[†]	-	-	-							
2	Age	34.58	10.17	.00	-						
3	Years in industry	7.18	7.16	-.06	**.73****	-					
4	Years with current company	4.69	5.29	.06	**.58****	**.68****	-				
5	Social support (5-items)	14.74	4.21	.10	.04	.04	.03	α .90			
6	Social capital sum (0-68)	17.39	13.27	**.19****	.00	-.09	.00	**.14***	-		
7	Social capital diversity (0-12)	7.24	2.85	**.21****	.00	-.08	-.01	**.19****	**.81****	-	
8	Psychological distress (10-items)	23.48	9.58	**.17***	-.10	**-.15***	-.05	**-.23****	**.44****	**.32****	α .94

Note. $N = 220$, significant findings in bold, *$p < .05$, **$p < .01$, [†] male = 1, female = 2.

To explore RQ1 to understand the relationship between social capital (in terms of sum and diversity) and RQ3 the relationship between social support and distress for infrastructure workers, a hierarchical regression analysis was conducted (Table 3). As aforementioned, the data was BCa bootstrapped based on 10,000 sample to ensure robustness and integrity of data. Step 1 of the model included the control variables (gender, age, years in industry, and years with current company). The overall model was significant, with only gender significantly predicting distress (females related to higher distress) though it is noted that this is approaching significance and should be interpreted cautiously. After controlling for the demographic variables, the analysis indicated that lower levels of social support was related to higher levels of psychological distress, which supports the majority of evidence relating to social support and impacts on distress in the literature. However, higher levels of social capital was related to higher levels of psychological distress, and that social capital diversity was not a significant predictor for distress in this study.

Table 3. Regression Parameters for Social Support and Social Capital on Psychological Distress

				Bootstrapped Parameters		
					95% CI	
Variables	B	SE B	β	*p*	Lower	Upper
Step 1	$F(4, 214) = 2.80, R = .22, R^2 = .05, p = .027$					
Gender	**3.20**	**1.45**	**0.15**	**.040**	**0.22**	**6.24**
Age	0.00	0.09	0.00	.970	-0.19	0.20
Years in industry	-0.26	0.15	-0.19	.058	-0.52	0.03
Years with current company	0.13	0.17	0.07	.437	-0.20	0.46
Step 2	$F(7, 218) = 12.85, R = .55, R^2 = .30,$ $\Delta F(3, 211), \Delta R^2 = .25, p < .001$					
Gender	2.38	1.28	0.11	.083	-0.28	5.05
Age	-0.03	0.08	-0.04	.682	-0.20	0.13
Years in industry	-0.12	0.13	-0.09	.321	-0.36	0.12
Years with current company	0.05	0.15	0.03	.726	-0.24	0.36
Social support	**-3.42**	**0.67**	**-0.30**	**> .001**	**-4.86**	**-2.08**
Social capital sum	**0.35**	**0.07**	**0.49**	**> .001**	**0.21**	**0.50**
Social capital diversity	-0.17	0.33	-0.05	.645	-0.92	0.55

Note. $N = 220$, significant findings in bold. Gender coded as 1 = males, 2 = females.

To explore RQ2 and examine if there was any specific category of social capital that impacted on distress, the components that contributed to the composition of social capital (i.e., the categories that are used to assess social capital diversity) were examined using an independent samples t-test (excluding cases listwise by analysis) categorising individuals as (1) non-distressed (scoring in the normal category) or (2) distressed (by combining mild, moderate, and severe as 'distressed'). This was because regression analyses was deemed inappropriate as not every individual nominated a source of social capital within each type of capital category and some distressed categories had small group sizes, they were therefore combined into one distressed grouping.

Categories were coded as family (children, siblings, parents, other relatives) non-distressed (M = 9.63, SD = 3.73), distressed (M = 15.32, SD = 5.47). Friends non-distressed (M = 3.11, SD = 1.70), distressed (M = 4.18, SD = 1.65). Work colleagues non-distressed (M = 3.11, SD = 1.85), distressed (M = 4.88, SD = 1.51). Neighbours non-distressed (M = 2.00, SD = 1.36), distressed (M = 3.90, SD = 1.78). Other (sporting/community groups, volunteering activities, school/education) non-distressed (M = 5.85, SD = 4.79), distressed (M = 9.80, SD = 5.25). Further, this analysis also adopted a conservative p-value of .01 with 99% BCa bootstrapping for data robustness.

Table 4. Independent Samples t-test of Social Capital Nominations

					BCa 99% CI	
Social Capital	t	M_{diff}	Std. Err	p	Lower	Upper
Family	**-5.39**	**-5.69**	**1.04**	**<.001**	**-8.37**	**-2.92**
Friends	-2.69	-1.07	0.40	.009	-2.01	-0.08
Work colleagues	**-4.54**	**-1.77**	**0.41**	**<.001**	**-2.78**	**-0.63**
Neighbors	**-4.84**	**-1.90**	**0.36**	**<.001**	**-2.83**	**-0.96**
Other	-3.24	-3.95	1.18	.002	-7.03	-0.72

Note. N = 220, significant findings in bold. Unequal variances assumed for family (F = 4.44, p = .038). Equal variances assumed for friends (F = 0.14, p = .711), work colleagues (F = 1.03, p = .314), neighbors (F = 2.30, p = .134), other (F = 0.72, p = .399).

The findings presented in Table 4 indicate that non-distressed workers had significantly less family members, work colleagues, and neighbours that they reported as part of their social capital. The social capital listed as other was marginal and should therefore be interpreted cautiously. These findings suggest that despite distressed workers as having significantly lower levels of social support, they also have significantly more overall social capital compared to non-distressed workers. This provides some evidence that although abundant in social capital, distressed workers are not potentially utilising their social capital to access social support.

To explore who workers accessed first when seeking social support and to answer RQ4 relating to understanding the sources of social capital infrastructure workers access to fulfill a social support need, a chi-square analyses was used. This examined the follow up question "who would you turn to first" for accessing the type of social support. The data was filtered in to 1) those with a partner ($n = 146$) and 2) those without a partner ($n = 74$) and are reported accordingly. This was conducted to distinguish how those individuals who had partners were accessing their partner rather than combining the partner as a family member. The groupings for social capital comprised of partner (for those that had partners), family, friends, work colleagues, neighbours, and other.

Someone to Listen

For those with a partner there was no significant difference (χ^2 [3, $N = 145$] = 7.35, $p = .062$) for who they would approach first for someone to listen. This was also the same for those without a partner, no significant difference (χ^2 [4, $N = 72$] = 6.31, $p = .177$) for who they would turn to first for someone to listen. Subsequently, no further analyses were conducted.

Advice on a Personal Problem

For those with a partner there was no significant difference (χ^2 [3, $N = 146$] = 2.86, $p = .413$) for who they would turn to first for advice on a personal problem. This finding was similar for those without a partner, with no significant difference (χ^2 [3, $N = 71$] = 2.39, $p = .495$) for who they would turn to first for advice on a personal problem. Subsequently, no further analyses were conducted.

Someone to Provide Love and Affection

For those with a partner there was no significant difference (χ^2 [4, $N = 145$] = 7.10, $p = .131$). Similarly, for those without a partner, no significant difference (χ^2 [4, $N = 69$] = 5.45, $p = .245$) for who they would turn to first for love and affection. No further analyses were conducted.

Someone to Provide Emotional Support

For those with a partner there was a significant difference (χ^2 [5, $N = 145$] = 16.43, $p = .006$). Follow up using adjusted residuals (applying a Bonferroni correction adjusted for 12 cell comparisons at

$p < .004$) was conducted. The analysis found that although distressed workers tended to nominate their partners less and their families and work colleagues more than non-distressed workers, after making alpha adjustments these differences were not statistically significant (Figure 1). For those without a partner, there was no significant difference (χ^2 [3, $N = 68$] = 1.85, $p = .604$) for who they would turn to first for emotional support, and no further analyses were conducted.

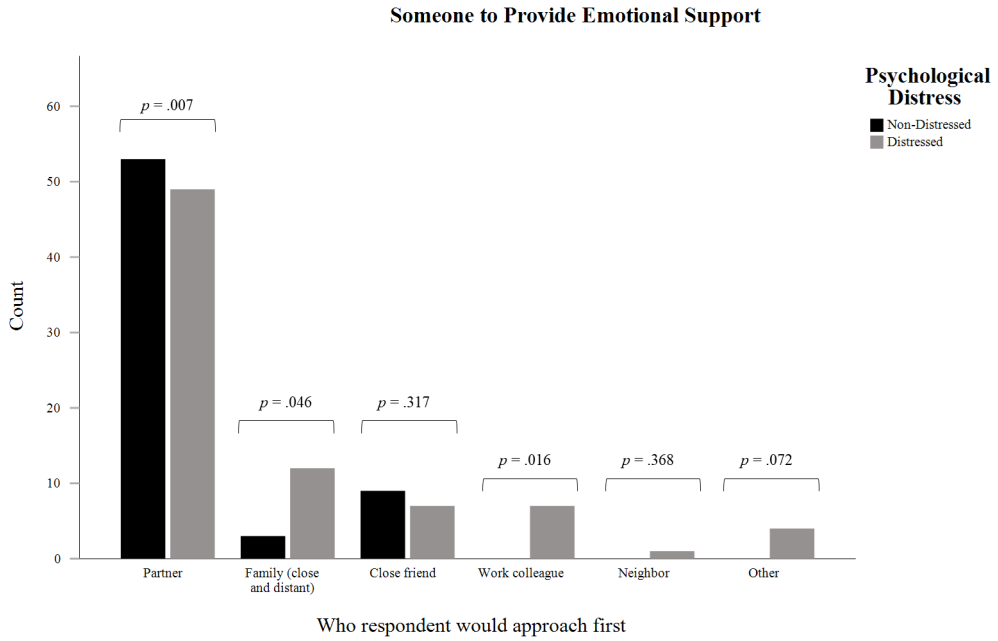

Figure 1. Those with a partner, who they would turn to first for emotional support

Someone with Whom You Have Much Contact (Companionship)

For those with a partner there was a significant overall difference for who they would approach first for companionship (χ^2 [4, $N = 146$] = 11.89, $p = .018$). Follow-up using adjusted residuals (applying a Bonferroni correction adjusted for 10 cell comparisons at $p < .005$) indicated a statistically significant difference where non-distressed workers nominated their partner more as who they would approach first $Z = 2.90$ $p = .004$ (Figure 2). For those without a partner, there was no significant difference (χ^2 [4, $N = 70$] = 3.82, $p = .431$) for who they would turn to first for companionship and no further analyses were conducted.

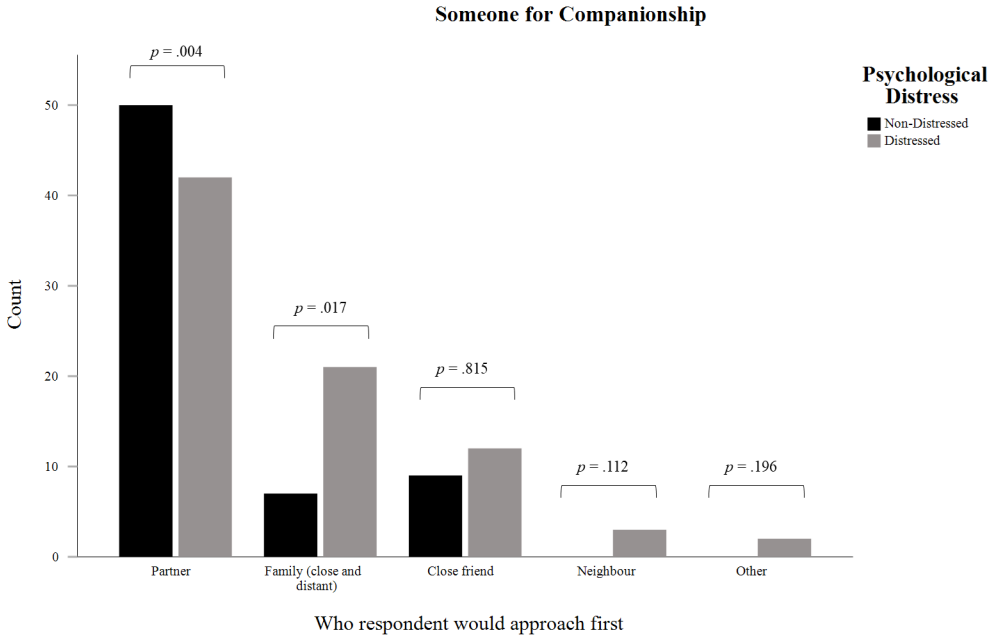

Figure 2. Those with a partner, who they would turn to first for companionship

In summary, this study found some evidence that those who were not currently experiencing psychological distress (in the normal category) had more social support available to them (though it is recognised that these differences were small/weak) and less social capital. This potentially indicates that although distressed workers have an abundance of social capital, they are not utilising or leveraging these support networks to obtain the necessary social support. When examining the specific sources of social capital further, distressed workers had significantly more family, friends, and work colleagues. When conducting further analyses on understanding which source of social capital were approached to provide a specific type of social support, these findings were mixed. The significant differences that existed were for those who had a partner, specifically when seeking companionship support, those that were not distressed, tended to nominate their partner as the person they would approach first, whereas distressed workers did not approach their partner first. Although other analyses indicated that distressed workers tended to utilise other contacts more such as family and work colleagues, due to conservative measures adopted to control for error, these follow-up findings were not significant.

Discussion

This study was designed to explore the support mechanisms that might exist for infrastructure workers. Individual support was identified by Nwaogu et al. (2022) as an important part of a three-tiered intervention approach required to address psychological distress within the industry. Subsequently the primary practical contribution of this research was to understand the use and adoption of social capital and social support (as support mechanisms) and their relationship with psychological distress for infrastructure workers. Further, it also examined if workers approached their social capital differently to receive a specific type of social support based on their distress as part of understanding if any gaps exist in these support structures.

The research found that in general the workers sampled had high levels of symptoms relating to psychological distress. Alarmingly, there was a high number of workers who scored mild distress or higher (with almost 30% in the severe category). These findings may indicate that the high rate of symptoms associated with distress found here is relatively consistent across different types of infrastructure work, though conclusions cannot be drawn as a non-infrastructure sample was not included to compare these levels of distress.

Additionally, from these findings several important correlational relationships were noted in the descriptive data, and although correlations are not indicative of any causal relationship, these relations present interesting findings. Specifically, social capital had a moderate positive association with psychological distress. Along with network diversity which also had a positive association with psychological distress (albeit a weak relationship). This indicates that the presence of increased social capital and diversity is associated with higher levels of distress. The theoretical implications of these findings tend to support Portes (1998) who recognised increased social capital impacted negatively on well-being. This is conflicting with Bourdieu (1985) and Adler and Kwon (2002) who state that more social capital was related to better well-being, and more recently findings by Xue et al. (2020). These findings provide insight in the complexity of assessing the impact that social capital has on mental health

and the need to better understand the implications on how social capital can benefit (or potentially disadvantage) workers who are needing to access social support.

The first research question (RQ1) was to understand the relationship between social capital (in terms of sum and diversity) on distress for infrastructure workers. The findings indicate higher levels of social capital and subsequently more diversity was associated with higher levels of psychological distress. These findings contribute to the broader theoretical literature, in particular findings support Portes (1998) who argued higher levels of social capital tend to place more demands on an individual within their networks, increasing strain and distress, which is considered an unintended consequence of social capital. This finding is also in contrast of other research investigating social capital and social support on construction workers. For example, Langdon et al. (2023) reported non-distressed workers had larger more diverse networks, however it was highlighted this study used a very small sample of construction workers and there may not have been enough distressed workers to draw definitive conclusions about the importance of network sum and diversity on psychological well-being. Further, it should be highlighted for this study, this represented an approximate average of two categories of difference between the normal and severe groups, which may not necessarily represent a substantial difference in diversity. The practical implications, however, indicate that within workplaces fostering social connections and building social capital through workplace interventions is a mechanism that could be adopted as work colleagues were often cited as a source of social capital. This means there is potential to leverage these existing resources to engage and increase interpersonal relationships and build the potential to access social support from these connections.

The second research question (RQ2) was to understand if there were any sources of social capital that related to distress. This research found that distressed workers had significantly more family, friends, and work colleagues. Although these associations indicate that having more of these are related to higher distress, these findings should be interpreted cautiously again because causal inferences cannot be assumed. However, these findings do potentially suggest that when considering those who have

higher levels of distress also have lower levels of social support (RQ3), this indicates the problematic nature of workers being able to approach their social capital to receive the social support that they need. Meaning, workers may feel like they have many friends, family, and work colleagues available, but are not able to use these sources of capital to assist them when needed. The practical implications of the findings suggest that the leveraging of these resources in a manner that can provide social or emotional support at work could be a necessary component to addressing the individual support/secondary intervention to build resilience or coping for workers (Nwaogu et al., 2022).

Finally, to understand the sources of social capital that infrastructure workers approach to fulfill a social support need (RQ4), this research found there were very few statistically significant findings (most likely due to the conservative approach adopted in the post-hoc analyses). Despite this, the initial evidence in this study found there were some differences for the approach of social capital for social support, specifically for those who had a partner. Those that were not distressed, tended to nominate their partner more for seeking companionship support than those who were distressed. Further (and as mentioned) although the follow-up analyses were not significant there were some instances of distressed workers indicating they accessed their work colleagues to provide social support.

Though this was not explored in detail in this study, the literature suggests reasons why individuals may not approach their partners to receive support. This includes, not wishing to over-burden their partner (Ennis & Bunting, 2013) or they may lack the necessary communication skills or have other barriers that may exist which may make it difficult to access those needs (Feeney, 1994). This may be more prevalent for those infrastructure workers who work long hours, have increased workload/demands, and/or work away from home for periods of time (Boschman et al., 2013; Bowen et al., 2013; Cattell et al., 2016) making it difficult to access the partner to provide support when needed. An alternative explanation by Offer (2021) and Offer and Fischer (2018) suggest that the partner may contribute to the distress or may be perceived as difficult, demanding, or unapproachable. This has theoretical implications for these findings suggesting the importance of understanding the dynamics of

relationships (within familiar or partnership contexts) and the contributions of these relationships on psychological well-being (or distress). For example, consideration for the interplay of stress and coping paradigms contributing to poor outcomes (e.g., see Cohen & Wills, 1985) or the relational breakdowns indicated as potentially problematic by Offer (2021) and Offer and Fischer (2018). This may indicate that the lack of receiving support from a partner could be contributing to feelings of distress. The practical implications of this findings were consistent with Langdon et al (2023) who also reported some distressed construction workers were seeking out work colleagues to provide support while at work. This presents an opportunity to workplaces to consider skilling their employees in active listening or other empathy-based communication skills that can assist in the provision of support at work to help increase social support and promote resilience and coping.

Limitations and Future Research

As previously mentioned as this is a cross-sectional study, causal inferences about the sequential nature of the relationships between social capital, support, and distress cannot be made and subsequently should be cautiously interpreted. Future research evaluating these relationships using alternative methodologies and study designs should be considered. Particularly given the contributions of this study in relation to the need to access social capital to provide social support appears to be different for distressed versus non-distressed workers. Additional research in understanding how social capital and social support can be leveraged as individual mechanisms to help alleviate distress is urgently needed to help address the high rates of suicide within industry.

A further limitation includes consideration of the representativeness of the participant sample, as they were primarily men (79%) and a large proportion of the respondents were recruited within the USA, followed by Canada, then the UK. Despite the USA reporting higher male participation of 82% in infrastructure industries (George & Kane, 2021) our sample is consistent with these figures with men highly represented within this industry. Although highly comprised of USA respondents, statistical checks between variables and countries did not indicate any significant differences. To ensure the

robustness and applicability of future research, it is recommended to examine these relationships further on a more diverse range of infrastructure workers to ensure a more comprehensive understanding of the impacts of social capital and social support as individual mechanisms to manage distress in these workers across countries.

Another limitation that is noted is the social capital index used here assesses a connection based on their level of communication with the indicated category as being at least once in the past two weeks. Importantly, the measure does not assess the quality of the relationships or friends identified and this may over-estimate the number of connections (sum of social capital). This is why this study assessed which social capital was likely to be utilised for accessing social support and also explored this based on the level of psychological distress currently experienced by workers. This was conducted to help provide additional understanding on this issue. Future research is needed to explore why distressed infrastructure workers might access a variety of social capital to receive support and to learn how workplaces can help these workers to receive support needed form various sources of social capital to help minimise their distress.

Considering this information, skilling construction workplaces to provide appropriate support may be useful to help these distressed workers. An example that draws on this, is the use of awareness and connector training in the Australian construction and mining industries or the availability of workplace mental health first aid programs. These programs provide formal training to workers to assist with supporting those who are experiencing life events and/or contemplating suicide and assists them to connect with appropriate services (Ferguson et al., 2017). Workplaces can leverage similar training to assist with identifying and providing appropriate support or assisting to connect to an appropriate external source to provide support where necessary. Therefore, the utilisation of work colleagues as a source of social capital can be trained and used as providers of social support or provide encouragement and connections to professional support services.

Higher levels of social capital (and subsequently diversity) were identified as important for those with increasing distress in this study. Several reasons may account for this finding including the quality of the friendship, the higher levels of social capital subsequently increasing the individual to more events, or the nature of the friendship impacting on well-being. It is important to further explore these relationships to gain an understanding of how social capital and receiving social support is important for minimising distress in these workers.

Conclusion

In response to the suggestion by Nwaogu et al. (2022) to assist with supporting workers in the construction industry, this study identified the support factors that may help with addressing the second tier level of intervention to understand the individual influences that can impact on worker distress. As mentioned, for workplaces to have successful interventions in improving mental health and ultimately lowing suicide, each of the three levels require targeting. However, the evidence thus far indicates the individual strategies of coping and building resilience have been unsuccessful at helping to mitigate distress (Langdon & Sawang, 2018; Nwaogu et al., 2022). This highlights that more work is needed to understand individual coping and/or resilience factors that are successful in helping individuals to manage their distress. Subsequently, the primary contribution of this research is the identification of an individual factor related to better psychological well-being for workers, namely social support delivered via social capital that infrastructure organisations (and/or industry) can consider leveraging to help support and manage their labour workforce. Specifically, this research identifies that social support is generally lower for workers who are experiencing psychological distress, despite workers reporting that they have higher levels of social capital (e.g., lots of friends, family, co-workers and/or different connections available). This evidence suggests that building individual support via the use of workplaces providing social support could be used (e.g., employees being skilled and utilised to provide support via listening and empathy) as a mechanism to build support and assist with minimising distress.

Next, this research also contributes to providing insight into the psychological well-being of infrastructure workers. The analysis of worker social capital and social support availability as it relates to worker distress (or non-distress) is critical to understanding the role capital and support that is available to target the secondary tier of support. This research identified that infrastructure workers continue to experience high levels of distress and they identify that work colleagues are utilised as sources of capital that they may engage with to help manage distress. This demonstrates there is a potential to leverage work colleagues to provide social support to help minimise distress from the identification of these connections as part of their social capital. These findings provide initial evidence via the exploration of social capital and social support that access to, and the provision of social support from different people can impact on distress for infrastructure workers. Through understanding the availability in worker social capital and support provisions, this study provides an initial foundation for assisting to target future workplace interventions to address the needs of workers experiencing distress, namely a lack of social support. Distressed workers were not utilising or leveraging their networks to obtain the necessary social support they needed, indicating a gap in workforce management that may be used to help support the mental health of workers. This is important because encouraging social connections at work, and increasing their social support, can help to alleviate distress, and has the potential to help with addressing suicide within the infrastructure industry.

Data availability: The data that support the findings of this study are available on request from the corresponding author.

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