













RESEARCH ARTICLE OPEN ACCESS

The Generality of Psychosocial Safety Climate Theory—A Fundamental Element for Global Worker Well-Being: Evidence From Four Nations

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ABSTRACT

Occupational health and safety researchers and policymakers often rely on organisational theories and evidence to provide valuable information for effective policy making and understanding. Yet, most traditional and contemporary organisational theories are developed within a single nation, often in high-income countries. Therefore, cross-national validation is required for generalisable worldwide use. The current study focuses on an antecedent to workplace health and safety, that is, the psychosocial safety climate (PSC), and aims to investigate if PSC is an etic (i.e., universally applicable) or emic (i.e., nationally/context specific) theory. Across nations, we investigate the construct meaning of PSC by testing PSC measurement invariance and the invariance of a nomological network of PSC relationships, (1) PSC to co-worker to work engagement (PSC extended Job-Demands Resources (JD-R) motivational pathway), (2) PSC to co-worker support to psychological distress (PSC extended JD-R health erosion pathway), and (3) the moderation of PSC on the co-worker to outcomes relationship. A total of 5854 employees from four nations (Australia = 1198, New Zealand = 2029, Malaysia = 575, Japan = 2052) participated in the study. Multi-group structural equation modelling suggested that there was measurement invariance in a four-factor PSC model across the four samples. Findings from multigroup analyses support both the PSC extended motivational and health erosion pathways across nations, as well as the moderation effect of PSC in the Australian and Japanese samples. Together, the results largely support the etic nature of PSC construct and theory, with a few national nuances.

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1 | Introduction

Workers' psychological health is under threat globally with around 15% of workers reporting a mental disorder (World Health Organization 2022). In Japan, nearly 3000 work-related suicide cases were reported in 2023 (National Police Agency (Japan) 2024) and in Australia and New Zealand, 47% of workers experienced work-related stress (Gallup 2024). As such, international organisations such as the World Health Organization (2010) and (International Labour Organization (ILO) 2016) have called for interventions in relation to worker psychological health and safety. According to the ILO, most European and high-income countries have comprehensive occupational health and safety governance, but this is less so in other regions, including low-income countries and Asia (ILO 2023a). The ILO therefore urges more action in these regions. A strategy is to build knowledge in workplace safety and health through high-quality research and data, and to develop tools that assess both traditional and emerging risks across nations (ILO 2023b).

However, most traditional and contemporary organisational theories that could explain workplace psychosocial risks were developed in high-income countries, necessitating cross-national validation for generalisable worldwide use. The dilemma of *etic* (i.e., universal across nations) and *emic* (i.e., nation specific) issues has emerged in relation to potential national or cultural differences in psychological theories and concepts (Georgas et al. 2004; Sanchez et al. 2006), as well as with the notion of safety (Mearns and Yule 2009; Noort et al. 2016) and occupational health (Scott et al. 2024). An *emic* theory is useful for understanding specific populations but does not provide information that can be generalised for comparative purposes with other countries or cultural groups, thereby limiting opportunities for global understanding and responses. Our intention, therefore, is to identify an *etic* theory for addressing psychosocial aspects of work across different nations, with a special focus on the Asia Pacific. By doing so, it is hoped that this theory and the knowledge built around it can be applicable in different countries to improve workers' psychological health. With this aim, we focused on an important and established work stress-related construct, psychosocial safety climate (PSC).

Psychosocial safety climate denotes the workers' shared perception of the organisational policies, practices, and procedures for the protection of worker psychological health and safety (Dollard and Bakker 2010). Within a high PSC organisation, there is an emphasis on humanity, pro-social values, and creating a supportive and healthy workplace where positive bonding and communication can occur (Yulita et al. 2022). High PSC could increase social support (Hu et al. 2022) which is a fundamental element of the human innate need for a sense of belonging (Ryan and Deci 2000). This is an important job resource that also has an inherent motivational function. By encouraging more social support, high PSC could link to positive work engagement. In contrast, low PSC is associated with low social support, thwarting individual innate needs and potentially leading to an increase in psychological distress.

While many studies of PSC have been conducted globally, most were conducted within a single nation (cf. Amoado et al. 2023), and cross-national comparisons remain scarce. Of the two most cited PSC studies, Dollard and Bakker (2010) was limited to an Australian sample while Idris et al. (2012) studied both the Malaysian sample and Australian sample. A few others have attempted a two-country comparison (e.g., Afsharian et al. 2016; McLinton et al. 2018). Nonetheless, these studies did not explicitly examine the influence or differences across cultures nor included an in-depth discussion on the countries' similarities and differences. An exception is Berthelsen et al. (2019), who conducted interviews in Germany and Sweden, confirming that PSC is useful in a European context. Yet, they did not test the relationship of PSC with other variables. We aim to expand this effort beyond Europe to understand PSC meaning and theory in other continents. Moreover, some research in other countries found mixed results. For example, a study by Havermans et al. (2017) among Dutch workers did not find a mediational pathway of PSC on work stress via social support, while the relationship has been supported in other papers (Dollard et al. 2012; Idris and Dollard 2011). In addition, the moderating effects of PSC were inconsistent. Recently, Inoue et al. (2025) found no evidence that PSC moderated the relationship between social support and psychological health among Japanese workers, while this moderation effect was found in Chinese (Ji et al. 2025) and Malaysian studies (Yulita et al. 2022). Thus, we propose that it is necessary to test if PSC is an *etic* theory that works similarly cross-nationally and, if so, whether it could be used as a target for interventions to improve worker psychological outcomes.

In this paper, we examine whether PSC is associated with workers' work engagement and psychological distress through co-worker support and whether PSC serves as a moderator in the relationship between co-worker support and psychological distress, and work engagement in the same way in four different countries, that is, Australia, New Zealand, Japan and Malaysia.¹

2 | Psychosocial Safety Climate

Psychosocial safety climate (PSC) refers to employees' perceptions of the organisation's safety management system for worker psychological health (Dollard et al. 2017; Potter et al. 2017). It consists of four aspects: management commitment and support for stress prevention, management priority for worker psychological health, organisational communication about psychosocial risks, and participation of relevant stakeholders in stress prevention. PSC can be conceived of as either an organisational concept, that is, organisational climate (Schneider and Reichers 1983) or an individual concept, that is, psychological climate (James et al. 2008; S. R. Kessler 2019). Scholars have found psychological and organisational climates to be different but each carries its own importance. Organisational PSC reflects a shared employee consensus on the status of the organisation with respect to its climate for worker psychological health. Organisational PSC is usually assessed by aggregating individual perceptions of PSC from an organisation or team. Psychological PSC differs from organisational PSC and captures the variations in individual experiences of PSC. In understanding a

comprehensive climate theory, Beus et al. (2023) posit that the individual-level perception of climate, or psychological climate, is where all climate starts and emerges, hence it is an important fundamental source of information. In line with this proposition, we focus on individual perceptions of PSC as so-called psychological PSC (McLinton et al. 2023; Owen et al. 2016) in the current study.

In the seminal paper of PSC, it is posited to have at least two functions: one as a leading indicator of working conditions and the other as a functional resource moderating the impact between job demands and work health. We examine the dual role of PSC not only as an antecedent but also as a moderator (Dollard and Bakker 2010). First, we elaborate on the role of PSC as a leading indicator of work conditions using the Job Demands-Resources (JD-R) model, and then we explain the moderation effect.

2.1 | The Extended Psychosocial Safety Climate-JD-R Model

Theoretically, the extended PSC-Job Demands-Resources (JD-R) model proposes that PSC is an antecedent of working conditions and affects psychological outcomes through dual-pathways – the health impairment and motivational pathways (Dollard and Bakker 2010; Zadow et al. 2019). The PSC extended health impairment pathway states that PSC is negatively related to the level of job demands, such that when PSC is low, high job demands are likely to occur which are in turn related to increased burnout. In the motivational pathway, high PSC is related to more job resources and increased work engagement.

From the various types of workplace resources identified in the literature (J. Y. Lee et al. 2020; Taris and Schaufeli 2015), we focus on social resources, specifically co-worker support. In a high PSC context, workers are protected from psychosocial threats and provided with the resources that they need and strive for. Under such positive conditions, it is posited that workers in a high PSC context are more likely to provide support to their co-workers because they receive reasonable or favourable treatment from their organisations. In line with the notion of generalised indirect reciprocity, an extended theory of reciprocity (Falk and Fischbacher 2006; Molm et al. 2007), individuals will reciprocate the treatment or resources they receive through PSC by providing social support to others.

Empirical evidence from different samples has supported this notion. In a study conducted in China, Hu et al. (2022), by integrating co-worker support, feedback and learning opportunities as job resources, found that PSC was positively associated with individual-level job resources, such as learning opportunities and co-worker support, which in turn positively affected Chinese workers' job crafting, work engagement and organisational commitment. In another study, Yulita et al. (2022) investigated a longitudinal link between PSC and different job resources, including emotional support from supervisors and peers and workers' psychological health among Malaysian police officers. They found that PSC predicted these resources after

4 months and that resources reduced police officers' psychological distress. We therefore hypothesised that.

Hypothesis 1. *PSC is positively related to co-worker support.*

Co-worker support helps fulfil individual workers' innate psychological needs for a sense of belonging and personal growth (Bronkhorst 2015; Ryan and Deci 2000). Based on the self-determination theory, fulfilment of these basic psychological needs in turn is likely to result in lower levels of psychological health problems. Co-worker support can help encourage personal growth by assisting co-workers in their tasks and providing validation for one's performance or work roles, which can lead to increased immersion and engagement. Co-worker support can also fulfil one's needs for belonging through the bonding created between workers, leading to feelings of job satisfaction and motivation to engage more with the job. Aligning with the reciprocity principle, receiving positive support from co-workers will encourage one to reciprocate such a treatment through their behaviours, thereby increasing work engagement. The importance of co-worker support in improving work engagement and preventing psychological distress has been consistently shown in the literature (e.g., J. Y. Lee et al. 2020; Mazzetti et al. 2023). In a meta-analysis conducted by Mazzetti et al. (2023), co-worker support was found to be positively associated with work engagement ($r = 0.27$).

Hypothesis 2. *Co-worker support is positively related to (a) work engagement and negatively related to (b) psychological distress.*

Employees are more likely support their co-workers to ensure their psychological health is looked after when PSC is high (Afsharian et al. 2023; Loh et al. 2021). In the PSC literature, there is evidence that co-worker support mediates the relationship between PSC and workers' motivation and psychological health. In a study among social workers in Sweden, Geisler et al. (2019) found that high PSC led to higher social support from co-workers which resulted in higher work engagement, job satisfaction, and organisational commitment. Similarly, a study conducted by Inoue et al. (2023) among the Japanese working population found social support to mediate the relationship between PSC and work engagement and psychological distress.

Hypothesis 3. *Co-worker support mediates the relationship between PSC and (a) work engagement and (b) psychological distress.*

2.2 | Psychosocial Safety Climate as a Moderator

In this study, we propose that PSC also moderates the relationship between co-worker support and work engagement and psychological distress. Co-worker support, similar to other type of resources, does not work alone (McLinton et al. 2023). As proposed by Loh et al. (2018), PSC is a pro-social ecology which allows resources to accumulate and boosts their effectiveness by providing bountiful conditions for their use. Where there is co-worker support within a high PSC work environment, it creates a resourceful environment (M. C. C. Lee and Idris 2019; Loh

et al. 2018) and that enables psychological distress to be reduced. PSC creates a psychologically safe condition with a focus on individuals' psychological well-being, such that the concerns of employees will be listened to actively and adequate actions will be taken without negative consequences. As a result, workers are more confident and comfortable to seek and give support to their co-workers. A high level of PSC can therefore amplify the role of co-worker support leading to higher work engagement.

There is some evidence for this, suggesting that a high level of PSC is necessary to 'activate' resources in the job resources-outcomes relationship. For instance, McLinton et al. (2023) using a longitudinal Australian sample found that PSC has an important role in mitigating the impact of low co-worker support on burnout after 6 months. They suggest that working in a low PSC context can trigger a negative spiral of psychological distress, but a high PSC work context could prevent this. In another study conducted by Ji et al. (2025) among white-collar employees in China, PSC moderated the relationship between emotional social support and work engagement so that the relationship between emotional support and work engagement was stronger when the level of PSC was high. Hence, we formulate the following hypothesis.

Hypothesis 4. *PSC moderates the relationship between co-worker support and (a) work engagement and (b) psychological distress.*

Specifically, we hypothesise that PSC could diminish the negative relationship between co-worker support and psychological distress and strengthen the positive relationship between co-worker support and work engagement. In other words, in a high PSC work context, the slope of co-worker support and work engagement will be positive and significant (i.e., steeper), whereas in a low PSC context, the relationship will be weaker or non-existent (i.e., flatter). For distress, in a low PSC context, the relationship between co-worker support and psychological distress will be negative, and this relationship will be weaker in a high PSC context.

3 | Current Study

There are many factors that could disrupt the generalisability of PSC theory. The national legal system and its regulations, the socio-political system, union density, economic conditions, and national culture could all be external factors that influence the status of PSC in an organisation within a nation (e.g., Dollard and Nesar 2013; Potter, Dollard, et al. 2024). While Australia, New Zealand, Malaysia and Japan are similar in their government structure, being mainly democracies, they differ in other areas. In relation to workplace policies and working culture, Australia and New Zealand are both considered to have excellent workplace health and safety laws (Potter, Ertel, et al. 2024), yet both have an intense working culture. The worker protection system in Malaysia is still at an early stage with less focus on psychosocial safety, but the working culture is more laid back. In contrast, even though Japan has legal protection for workers, particularly in relation to *karoshi* (i.e., death due to

overwork), work is intense with long working hours promoted and upheld in Japanese culture. With reference to cultural dimensions as proposed by Hofstede (2011), Australia and New Zealand are low in power distance and high in individualism, while Malaysia and Japan are high in power distance and low in individualism (Minkov and Kaasa 2022). Power distance and individualism/collectivism are more critical than other cultural dimensions because they shape the fundamental aspects of organisational culture, climate, and leadership, which in turn affect employee psychological health outcomes. Taken together, these kinds of national differences are potentially powerful influences on the status of PSC and could shape how PSC functions within a work setting, leading to an emic interpretation of PSC theory.

According to the etic versus emic discussion in the literature, certain concepts are similar across cultures because they are perceived and understood in a universal way, but some are not. For example, paternalistic leadership is more likely an emic leadership approach highly embraced in East Asian organisations (Cheng et al. 2014) while ethical leadership is etic, with specific behaviours expected from leaders across cultures (Resick et al. 2011). While variations between nations related to the relationships between focal variables (especially psychosocial factors and workers' psychological health outcomes) have been consistently found (e.g., Glazer and Amren 2018), the influence of distinct cultural variables, such as power distance or collectivism, remains inconclusive (Scott et al. 2024). In recognizing of the national factors influencing PSC are far beyond these specific cultural elements, we employ a multi-national, rather than a cross-cultural design, to explore the relationships (ref. Spector et al. 2015).

In testing construct meaning, many studies have focused on measurement invariance by establishing the psychometric properties of an instrument across different groups. This is particularly important for subjective constructs such as perceptions and emotions, and is, therefore needed for PSC. A perfect invariance suggests that two individuals from different nations will respond exactly the same on the same instrument. While this is one way of testing meaning, it is also important to look beyond the instrument to consider a nomological network of a construct and its theory. In an effort to understand suicide among workers, Loerbroks et al. (2016) found that the influence of psychosocial stressors on suicidal ideation is consistent across six nations. In contrast, Glazer and Amren (2018) found that the interaction between support and job stressors differed across nations. In the current study, we investigate both possibilities by first testing the measurement invariance of the PSC-12 scale, the scale commonly used to measure PSC, and second by testing the universal applicability of the PSC theoretical nomological network. Figure 1 illustrates the model of the current study.

4 | Method

4.1 | Sample Information and Research Design

Data were collected from four nations in the Asia Pacific region, Australia, Japan, Malaysia, and New Zealand, among workers

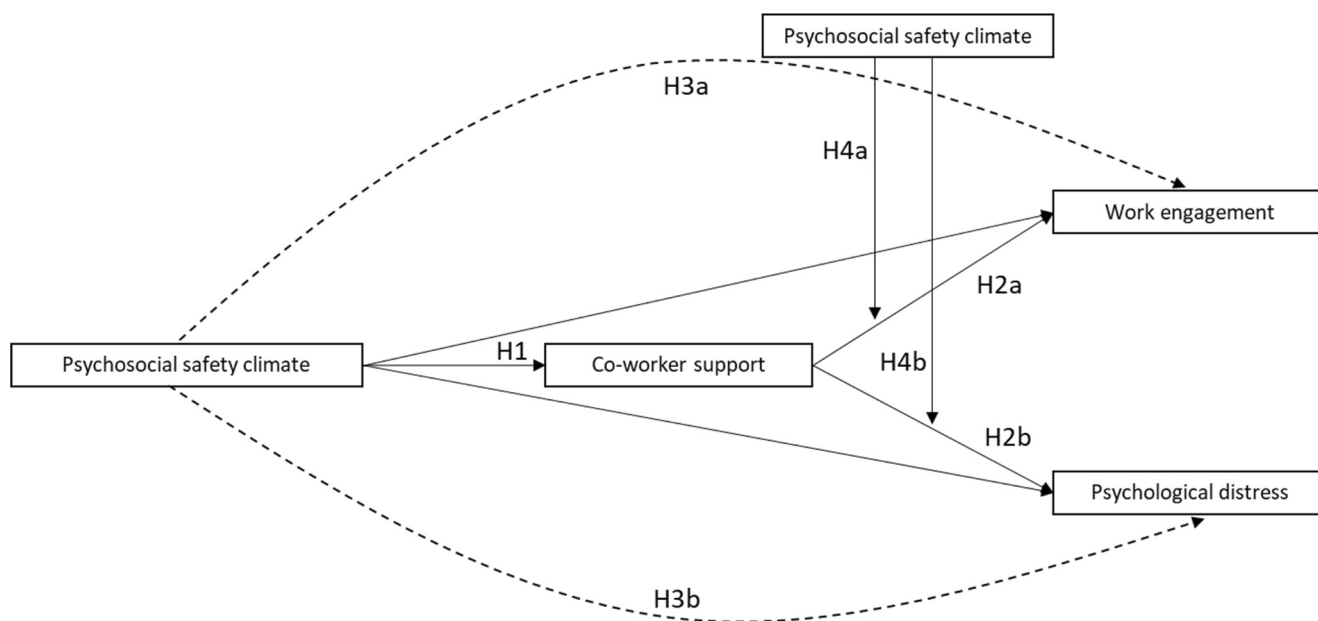


FIGURE 1 | Study model of the current paper.

from different industries and occupations. The respondents answered a survey/interview asking about their experience at their workplaces and their personal well-being. Each sample was part of a larger research project conducted in each nation. The initial data obtained was 5854 responses, $n = 1198$ (Australia), $n = 2029$ (New Zealand), $n = 575$ (Malaysia), and $n = 2052$ (Japan). After omitting missing values, the final sample was 5565, $n = 1137$ (Australia), $n = 2013$ (New Zealand), $n = 511$ (Malaysia), and $n = 1904$ (Japan). The details of each data set are shown in Table 1.

4.2 | Measures

Psychosocial safety climate was measured with the PSC-12 scale (Hall et al. 2010) which assessed the four dimensions of PSC. The four dimensions are: Management support and commitment (e.g., ‘Senior management acts decisively when a concern of an employees’ psychological status is raised’), management priority (e.g., ‘Senior management considers psychological health to be as important as productivity’), organisational communication (e.g., ‘My contributions to resolving occupational health and safety concerns in the organisation are listened to’), and organisational participation (e.g., ‘In my organisation, the prevention of stress involves all levels of the organisation’). A five-point Likert scale was used for this scale (‘1’ = strongly disagree; ‘5’ = strongly agree). Cronbach alpha values of this scale in this study were 0.95 (Australia), 0.96 (New Zealand), 0.92 (Malaysia) and 0.97 (Japan).

Co-worker support was assessed using items related to the support received by the workers from their colleagues. There are different scales for measuring co-worker support. The Job Content Questionnaire (JCQ) (Karasek et al. 1998) was used in the Australian and Malaysian samples, the Brief Job Stress Questionnaire was used in Japan (Shimomitsu et al. 2000) while a bespoke scale was used in New Zealand (O’Driscoll et al. 2004).

These scales are slightly different but highly reliable and valid. A four-point Likert scale was used in the Australian, Japanese, and Malaysian samples, while the New Zealand sample used a six-point Likert scale. Scale scores were computed as the mean of items. To allow comparison, we transformed the scores of Australian, Japanese, and Malaysian by multiplying by 1.5. Sample items used in each study are described in Table 2. The Cronbach alphas of these scales across samples were 0.85 (Australia), 0.93 (New Zealand), 0.80 (Malaysia) and 0.84 (Japan).

Work engagement was assessed with the three-item Ultra-short Utrecht Work Engagement Scale (UWES-3; Schaufeli et al. 2017), including ‘I am immersed in my work’, ‘At my work, I feel bursting with energy’ and ‘I am enthusiastic about my job’. The scale was measured using a seven-point scale (‘0’ = Never; ‘6’ = Everyday). Cronbach’s alpha across samples were 0.72 (Australia), 0.80 (New Zealand), 0.74 (Malaysia) and 0.89 (Japan).²

Psychological distress was measured using six items from the Kessler-6 (K-6) scale (R. C. Kessler et al. 2002). Example items include ‘During the past 4 weeks, how often did you feel (a) nervous?’; and, (b) restless or fidgety?’ A four-point Likert scale was used with ‘0’ = none of the time and ‘4’ = all of the time. Cronbach alphas of the scale were 0.83 (Australia), 0.88 (New Zealand), 0.37 (Malaysia) and 0.94 (Japan). The Malaysian scale was particularly low, so it was excluded from the measurement invariance and hypothesis testing.

4.3 | Analysis Procedure

The data were prepared using IBM’s SPSS Statistics (SPSS) software version 29 (IBM Corp 2023). Descriptives, reliability, and data transformation were also conducted using SPSS. All other analyses were conducted using the Mplus Version 8.10 statistical package (Muthén and Muthén 2017).

TABLE 1 | Sample information and data collection process.

Sample	Year	Data collection process	Sample description
Australia	2021	A national sample of 1198 employees were involved in a survey under the Australian Workplace Barometer project (AWB; Dollard and Bakker 2010). The AWB project is a longitudinal research project collecting data across all industries and occupations. The data used in this study were collected using computer-assisted telephone interviews. Participants were above age 18, working in various types of employment including full-time and casual.	Among the Australian respondents, 42.3% of the respondents were male, 56.9% were female and 0.8% identified themselves as non-binary gender or refused to answer. The average age was 53.09 years. More than half worked permanently full-time (61.4%). Respondents were from multiple industries, mostly from health and community services (22.6%), education (18%), and government administration and defence (12.9%).
New Zealand	2021	A national sample of 2029 New Zealand employees were included. The sample was obtained from the New Zealand Workplace Barometer (NZWB; Forsyth et al., 2022). Data collection was conducted through an e-survey where full-time employees from 23 New Zealand organisations above the age of 18 were eligible to participate in this study. The organisations were geographically dispersed and located across New Zealand.	51.3% of the respondents identified as male with 48% as female, and 0.7% as other, with a mean age of 44.52 years. Most of the respondents held a permanent employment arrangement. Over 20% of the respondents worked in transportation, 17.2% in construction, others in education, healthcare and utilities sector.
Malaysia	2015	A total of 575 Malaysian employees working in the state of Selangor, Malaysia were included in this study. Research assistants visited houses selected using a stratified random sampling from a household map obtained from the Department of Statistics in Malaysia and invited the target sample to participate. We sampled one working adult from each household.	A total of 47.8% of the Malaysian respondents were male and 43.8% female. The median age range was 26–34 years old. The respondents were worked in varied sectors such as public security (10.1%), education (11.7%), manufacturing (9.4%), trading (7.7%), transportations (6.1%), and agriculture (5.6%).
Japan	2021	A national sample of 2052 Japanese workers participated in the study. The sample was selected to be representative based on age and sex distribution in Japan. Data were collected, through online survey using a data collection agency, from employees of small and medium enterprises, working full-time, and over 18 years. To avoid careless and low-quality responses, we excluded responses with time taken of < 2 s per item, duplicate IP address, and zero annual income.	In the Japanese sample, 50.2% were male and 49.8% were female. The median age range was 40–49 years. Respondents were all working full time in various sectors including utilities (17%), accommodation or food services (12%), manufacturing (10.9%), and others in technical services, etc.

TABLE 2 | Co-worker support items.

Sample	Number of items	Example of items	Scale
Australia	3	'People I work with are helpful in getting the job done'	JCQ
New Zealand	4	'My colleagues provide helpful information or advice about my work'	O'Driscoll et al. (2004)
Malaysia	7	'People I work with are helpful in getting the job done'	JCQ
Japan	3	'How freely can you talk with your co-workers'	The Brief Job Stress Questionnaire; Shimomitsu et al. (2000)

Note: The Brief Job Stress Questionnaire is used widely in Japan as an occupational health screening too. Abbreviation: JCQ = Job Content Questionnaire (Karasek et al. 1998).

4.3.1 | Measurement Invariance of the PSC-12 Scale

To establish the measurement invariance of the PSC-12 scale, we used structural equation modelling and assessed (1)

configural invariance, which assumes that the structure of the model is the same (invariant) across samples, (2) metric invariance, which assumes the measurement of all factor loadings is equal across groups, and (3) scalar invariance which

assumes equal factor loadings and intercepts across samples. We ran two models. First, we ran a one-factor model with all items loaded on the same factor. We then specified a model with items loaded on four factors representing the four dimensions in line with the construct of PSC and the paper by Hall et al. (2010). To check measurement invariance, we compared the models' comparative fit index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardised root mean squared residual (SRMR). Models with CFI and TLI > 0.90 and RMSEA and SRMR < 0.08 are considered to have a good fit. In relation to model comparison, measurement invariance holds when the differences between models' CFI, TLI, RMSEA, and SRMR are less than 0.02 (Vandenberg and Lance 2000). A Chi-square comparison test was also reported, but note that significant results are often obtained if large sample sizes are used. The results were elaborated in the Results section (Table 3, MI Model 1 and 1a).

4.3.2 | Measurement Invariance Check for All Variables

Before proceeding with the hypothesis testing on the nomological network of PSC, it is important to establish measurement invariance for all included variables. To understand if the constructs are universal across the four samples, we ran a multiple indicators model testing measurement invariance for the four samples on items of PSC, psychological distress, and work engagement (see Table 3). Because different scales were used for co-worker support as described above, we did not include the items in the test. The Malaysian sample was not included in the psychological distress test.

The measurement invariance test ascertained that there was configural invariance across the four samples for PSC, work engagement, and psychological distress (see Table 3, MI Model 2). Although the Chi-Square comparison test showed metric invariance, we proceeded with checking the differences in CFI, TLI, RMSEA and SRMR between the configural and metric models. The metric invariance in the current study was acceptable, allowing us to make a general comparison on the investigated pathways with $\Delta\text{CFI} = 0.02$, $\Delta\text{TLI} = 0.01$, and $\Delta\text{RMSEA} = 0.01$ (Rutkowski and Svetina 2013), but a slightly higher ΔSRMR , when comparing the metric model against the configural model. However, scalar invariance was not found for a measurement model with all three variables, suggesting there are group differences on items, intercepts and variances across the three variables. To test our hypotheses, we therefore proceeded with analysis using the composite means of each variable in a multigroup pathway model.

4.3.3 | Hypothesis Testing

A multigroup analysis was conducted using *Mplus* 8.10 (Muthén and Muthén 2017), with a robust maximum likelihood (MLR) estimator. To account for national differences, we mean-centred all the four variables with the countries' means. We regressed psychological distress and work engagement on co-worker support and PSC, and co-worker support on PSC. An interaction term of PSC \times co-worker support was created using the mean-centred scores to assess the moderation effect of PSC on the relationship between co-worker support and outcomes (i.e., psychological distress and work engagement). Indirect effects

TABLE 3 | Measurement invariance tests.

	Chi-square	CFI	TLI	RMSEA	SRMR	df	Compared with	Model comparison test
MI Model 1								
PSC—One-factor model								
Configural invariance	5937.31***	0.92	0.90	0.13	0.04	216		
Metric invariance	6565.66***	0.91	0.90	0.13	0.07	249	Metric against Configural	628.35 (33)***
Scalar invariance	7865.07***	0.89	0.90	0.14	0.10	282	Scalar against Configural Scalar against metric	1927.77 (66)*** 1299.42 (33)***
MI Model 1a								
PSC—Four-factor model								
Configural invariance	1763.67***	0.98	0.97	0.07	0.02	192		
Metric invariance	2090.19***	0.97	0.97	0.08	0.05	216	Metric against Configural	326.53 (24)***
Scalar invariance	2999.56***	0.96	0.96	0.09	0.06	240	Scalar against Configural Scalar against metric	1235.89 (48)*** 909.36 (24)***
MI Model 2								
All studied variables								
Configural invariance	8128.22***	0.93	0.92	0.08	0.04	744		
Metric invariance	9388.50***	0.91	0.91	0.09	0.07	798	Metric against Configural	1260.28 (54)***
Scalar invariance	14277.77***	0.87	0.87	0.10	0.10	852	Scalar against Configural Scalar against metric	6149.55 (108)*** 4889.27 (54)***

Abbreviations: CFI = comparative fit index; df = degree of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root mean squared residual; TLI = Tucker Lewis Index.

were estimated using the bootstrapping method. Interaction plots were prepared using Dawson's Excel sheet (Dawson 2014). All models controlled for age, gender, and organisational tenure. Similar results were obtained without controls.

5 | Results

In Table 3, we found that the four-factor PSC model (MI Model 1a) showed a better model fit compared to the one-factor PSC model (MI Model 1). In addition, MI Model 1a demonstrated that the measurement invariance of PSC with a four-factor structure holds true across the four countries. When comparing the scalar model with the metric model, the differences between all the indices, (i. e., CFI, TLI, RMSEA, and SRMR) were less than 0.02, confirming the measurement invariance of the PSC-12 scale. With our particular interest in PSC as an etic theory, we proceeded to test the influence of PSC on other variables.

Table 4 shows the descriptives information, Table 5 shows the correlations of the study variables across samples, Table 6 shows the mediation model, and Table 7 shows the moderation model. The correlations showed that across countries all variables were significantly related to one another and in the expected directions.

Hypothesis 1 proposed a positive relationship between PSC and co-worker support. The multigroup model results showed support for Hypothesis 1. In Australia, the results were, $B = 0.22$, $SE = 0.02$, $p < 0.001$, in New Zealand, $B = 0.52$, $SE = 0.02$, $p < 0.001$, in Malaysia, $B = 0.37$, $SE = 0.04$, $p < 0.001$, and in Japan, $B = 0.47$, $SE = 0.03$, $p < 0.001$.

Hypothesis 2 proposed that co-worker support would be related to (a) work engagement and (b) psychological distress. We found a positive relationship between co-worker support and work engagement for all four samples (Australia: $B = 0.20$, $SE = 0.05$, $p < 0.001$; New Zealand: $B = 0.31$, $SE = 0.02$, $p < 0.001$; Malaysia: $B = 0.23$, $SE = 0.09$, $p < 0.01$; Japan: $B = 0.28$, $SE = 0.03$, $p < 0.001$). Furthermore, we found that co-worker support was negatively related to psychological distress in the Australia ($B = -0.65$, $SE = 0.16$, $p < 0.01$), New Zealand ($B = -0.71$, $SE = 0.09$, $p < 0.001$), and Japan ($B = -0.98$, $SE = 0.12$, $p < 0.001$) samples. Hypothesis 2a and 2b were supported.

Hypothesis 3a proposed that PSC would be related to work engagement through co-worker support. Co-worker support mediated the relationship between PSC and work engagement with $B = 0.04$, $SE = 0.01$, $p < 0.001$; $B = 0.16$; $SE = 0.01$,

$p < 0.001$; $B = 0.09$; $SE = 0.03$, $p < 0.01$; $B = 0.13$; $SE = 0.02$, $p < 0.001$ for Australia, New Zealand, Malaysia, and Japan respectively. Hypothesis 3a was supported.

Hypothesis 3b proposed that co-worker support would mediate the relationship between PSC and workers' psychological distress, after controlling for the main effect of PSC. The mediated pathway of PSC to psychological distress through co-worker support was found for Australia ($B = -0.14$, $SE = 0.04$, $p < 0.001$), New Zealand ($B = -0.37$, $SE = 0.05$, $p < 0.001$), and Japan ($B = -0.46$, $SE = 0.06$, $p < 0.001$). Hypothesis 3b was supported for all three samples (not tested in Malaysia).

Against our expectations, we did not find moderating effects of PSC on the relationship between co-worker support and work engagement in any of the four samples so Hypothesis 4a was not supported. But given the difficulty in searching for moderation effect, we followed suggestions from some scholars to ease the p -value threshold (Frese 1999). As shown in the results, the moderating effect of PSC was one-tailed significant for the relationship between co-worker support and work engagement among the Australian sample ($B = -0.08$; $SE = 0.05$, $p < 0.10$) (see Table 7). Figure 2 illustrates that when PSC is low, the slope between co-worker support and work engagement is steeper. This is supported by the simple slope test, which shows a significant slope only for low PSC ($t = 2.35$, $p < 0.05$) but not high PSC.

In relation to Hypothesis 4b, the moderating effects of PSC on co-worker support and psychological distress were found in the Australian ($B = 0.29$; $SE = 0.15$, $p < 0.10$) and Japanese ($B = 0.24$; $SE = 0.11$, $p < 0.05$) samples providing partial support for H4b. Simple slope tests indicated that at low PSC values, high co-worker support was negatively related to psychological distress ($t = -4.51$, $p < 0.001$ for Australian sample; $t = -7.45$, $p < 0.001$ for Japanese sample). At high PSC values, the slope between co-worker support and psychological distress was significant only for Japanese sample ($t = -4.53$, $p < 0.001$) (see Figures 3 and 4).

Figure 5 shows the results models for the current study.

6 | Discussion

Previous studies have mostly investigated the role of PSC on employee work and psychological outcomes within a single

TABLE 4 | Descriptives of PSC, Co-worker support, psychological distress, and work engagement of each sample.

	Australia		New Zealand		Malaysia		Japan	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Psychosocial safety climate	3.48	0.91	3.31	0.98	3.52	0.75	2.82	0.91
Co-worker support	5.05	0.72	4.44	1.18	4.56	0.75	3.61	1.11
Work engagement	5.76	1.16	5.38	1.19	5.01	1.30	3.20	1.48
Psychological distress	1.47	0.66	1.81	0.84			1.91	1.04

Abbreviation: SD = standard deviation.

TABLE 5 | Correlations of each variables in the current study.

	PSC											
	Co-worker support				Work engagement							
	Australia	New Zealand	Malaysia	Japan	Australia	New Zealand	Malaysia	Japan	Australia	New Zealand	Malaysia	Japan
1. PSC	—	—	—	—	—	—	—	—	—	—	—	—
2. Co-worker support	0.292**	0.436**	0.383**	0.384**	—	—	—	—	—	—	—	—
3. Work engagement	0.310**	0.438**	0.331**	0.447**	0.207**	0.421**	0.264**	0.355**	—	—	—	—
4. PsyDis	-0.235**	-0.369**	—	-0.247**	-0.161**	-0.300**	—	-0.256**	-0.319**	-0.452**	—	-0.261**

Note: Malaysian's psychological distress scale is omitted from the analysis due to the concern of poor psychometric properties. Abbreviations: PSC = psychosocial safety climate; PsyDis = psychological distress.

nation. To explore the generalisability of the meaning of the PSC construct and the theory, we examined the measurement invariance of a commonly used PSC instrument, the PSC-12, to determine whether it captures a similar meaning of PSC cross-nationally. To test cross-national generalisations of the PSC theory, our multi-national study aimed to provide evidence of the universal applicability of PSC and its theoretical nomological framework. As such, the study set out to investigate how PSC is linked to psychological distress and work engagement through co-worker support, using evidence from four nations. We also investigated the role of PSC as a moderator in affecting the direct relationships between co-worker support and workers' psychological distress and work engagement.

6.1 | Psychosocial Safety Climate as an Etic Construct

In general, measurement invariance was found using the PSC-12 scale on the construct of PSC and its four dimensions. This invariance suggests that the concept of PSC is conceptualised in a similar way between Australia, New Zealand, Malaysia, and Japan, making multinational generalisability appropriate. Establishing the measurement invariance of PSC implies that it is suitable for researchers and practitioners to use the construct across different nations and to generalise the existing knowledge of PSC from single-nation studies to multi-nation contexts.

6.2 | Psychosocial Safety Climate Theory as an Etic Theory

By testing and confirming the nomological network of PSC, we found that PSC is an etic theory that works similarly in different nations as an indicator of co-worker support and workers' psychological health. Looking across samples, we can deduce that all samples showed support for the motivational pathway and health impairment pathway within the extended PSC JD-R theory. High PSC is associated with a higher level of co-worker support, confirming the function of PSC in providing more resources at work and encouraging positive behaviours of workers (i.e., support) as a result of reciprocity. Additionally, through co-worker support, we found relationships of PSC and psychological distress and work engagement across samples. Specifically, higher PSC could protect workers from psychological distress arising from low co-worker support, supporting the existing studies on the role of PSC in protecting and promoting occupational health (Afsharian et al. 2021; McLinton et al. 2023; Zadow et al. 2021). We also found PSC positively related to co-worker support and in turn to work engagement. This also supports the motivational pathway of PSC, similar to studies by Inoue et al. (2023) and Hu et al. (2022).

The moderating effects of PSC on the co-worker to psychological distress relationship is shown in Australian and Japanese samples, with one-tailed significance for Australia, but differ from what the theory would suggest (e.g., McLinton et al. 2023). Theoretically, co-worker support should reduce psychological distress when PSC is high, where PSC optimises the impact of co-worker support. For the Japanese sample, we

TABLE 6 | Multigroup analysis results for the relationship between PSC, psychological distress, and work engagement mediated by Co-worker support.

	Australia				New Zealand				Malaysia				Japan			
	N = 1137				N = 2013				N = 511				N = 1904			
	B	SE	t	p	B	SE	t	p	B	SE	t	p	B	SE	t	p
Support → Engagement	0.20	0.05	4.03	< 0.001	0.31	0.02	13.90	< 0.001	0.23	0.09	2.68	0.008	0.28	0.03	9.82	< 0.001
Support → PsyDis	-0.65	0.16	-4.10	< 0.001	-0.71	0.09	-7.80	< 0.001					-0.98	0.12	-7.88	< 0.001
PSC → Engagement	0.31	0.04	8.03	< 0.001	0.35	0.03	12.74	< 0.001	0.41	0.09	4.81	< 0.001	0.50	0.03	14.46	< 0.001
PSC → PsyDis	-0.74	0.13	-5.90	< 0.001	-1.29	0.11	-11.74	< 0.001					-0.88	0.15	-5.95	< 0.001
PSC → Support	0.22	0.02	9.21	< 0.001	0.52	0.02	21.49	< 0.001	0.37	0.04	9.12	< 0.001	0.47	0.03	18.13	< 0.001
Indirect effects																
PSC → Support → Engagement	0.04	0.01	3.69	< 0.001	0.16	0.01	11.67	< 0.001	0.09	0.03	2.56	0.010	0.13	0.02	8.63	< 0.001
PSC → Support → PsyDis	-0.14	0.04	-3.74	< 0.001	-0.37	0.05	-7.33	< 0.001					-0.46	0.06	-7.25	< 0.001
R Squared																
Engagement	0.11	0.02	6.18	< 0.001	0.25	0.02	14.82	< 0.001	0.09	0.02	3.82	< 0.001	0.25	0.02	14.90	< 0.001
PsyDis	0.08	0.02	5.08	< 0.001	0.22	0.02	13.06	< 0.001					0.13	0.01	9.42	< 0.001
Support	0.07	0.02	4.79	< 0.001	0.19	0.02	11.92	< 0.001	0.14	0.03	4.92	< 0.001	0.15	0.02	9.85	< 0.001
Model fit																
Chi-square contribution			3.69				34.17				23.33				2.09	
-2 Log likelihood																
CFI/TLI																
RMSEA/SRMR																
Model's Chi-square (df)																

Note: Outcomes were controlled by age, gender and organisational tenure. Malaysian's psychological distress scale is omitted from the analysis due to the concern of poor psychometric properties.

Abbreviations: CFI = comparative fit index; df = degree of freedom; Engagement = work engagement; PSC = psychosocial safety climate; PsyDis = psychological distress; RMSEA = root mean square error of approximation; SRMR = standardised root mean squared residual; Support = Co-worker support; TLI = Tucker Lewis Index.

found that the relationship between co-worker support and psychological distress was negative and significant when PSC was high and PSC was low. But for the Australian sample, rather than boosting the impact of co-worker support, we found that the relationship between co-worker support and psychological distress was only significant when PSC was low (compensatory). Moreover, when PSC is high (+1 SD), we observed a flatter line in Figures 3 and 4, albeit of lower levels of psychological distress, and a steeper slope for low PSC (-1 SD). Possibly PSC and co-worker support are compensatory resources, in which the level of psychological distress is low when either co-worker support or PSC is high.

We only found a general moderating effect of PSC and co-worker support for work engagement in Australia at one-tailed significant. In line with some extant evidence (e.g., Ji et al. 2025), PSC works as a compensatory resource of co-worker support (or the other way round) on work engagement. When PSC is low, co-worker support is positively related to work engagement, but when PSC is high, the impact of co-worker support seems trivial. Noting at high PSC, work engagement is generally higher than of low PSC. Although we did not find a

moderator effect in other samples, echoing previous evidence (Japanese: Inoue et al. 2025; Malaysian: Yulita et al. 2022), this may indicate that more investigation is needed in these countries as this could reflect cross-national differences in the moderation of PSC. It is noteworthy that we only examined psychological PSC in the current study; it remains unclear if PSC measured at the team or organisational level might show a different effect. Certainly, to find moderation is difficult (Murphy and Russell 2017) with many statistical issues which can complicate the overall picture.

6.3 | Theory and Research Implications

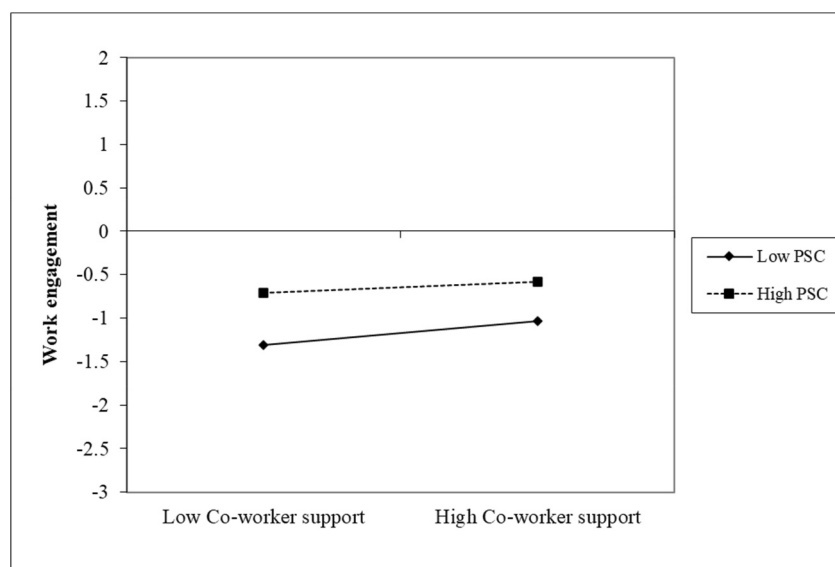
The current study extended cross-national occupational health research and previous PSC studies. Our multi-national PSC study focused on four countries, and despite evidence about differences in their cultural dimensions (Hofstede 2011) and occupational health and safety regulations (Potter, Ertel, et al. 2024), we established multi-national evidence that the meaning of PSC, measured through PSC-12 scale, is invariant. Despite these potentially powerful social influences on the meaning of PSC, we

TABLE 7 | Multigroup analysis results for the relationship between Co-worker support, psychological distress, and work engagement moderated by PSC.

	Australia				New Zealand				Malaysia				Japan			
	N = 1137				N = 2013				N = 511				N = 1904			
	B	SE	t	p	B	SE	t	p	B	SE	t	p	B	SE	t	p
Support → Engagement	0.19	0.05	3.96	< 0.001	0.31	0.02	13.29	< 0.001	0.25	0.09	2.83	0.005	0.27	0.03	9.65	< 0.001
Support → PsyDis	-0.63	0.16	-4.01	< 0.001	-0.69	0.09	-7.42	< 0.001					-0.93	0.12	-7.62	< 0.001
PSC → Engagement	0.31	0.04	7.82	< 0.001	0.35	0.03	12.75	< 0.001	0.40	0.09	4.66	< 0.001	0.49	0.04	14.10	< 0.001
PSC → PsyDis	-0.74	0.13	-5.85	< 0.001	-1.29	0.11	-11.75	< 0.001					-0.97	0.15	-6.44	< 0.001
Moderating effects																
PSC × Support → Engagement	-0.08	0.05	-1.73	0.083	-0.03	0.02	-1.42	0.157	0.12	0.09	1.30	0.193	0.03	0.03	1.13	0.257
PSC × Support → PsyDis	0.29	0.15	1.96	0.050	0.07	0.08	0.97	0.332					0.24	0.11	2.21	0.027
R Squared																
Engagement	0.11	0.02	6.13	< 0.001	0.25	0.02	14.82	< 0.001	0.10	0.03	3.84	< 0.001	0.24	0.02	14.16	< 0.001
PsyDis	0.08	0.01	5.14	< 0.001	0.21	0.02	12.92	< 0.001					0.14	0.02	9.46	< 0.001

Note: Outcomes were controlled by age, gender and organisational tenure.

Abbreviations: Engagement = work engagement; PSC = psychosocial safety climate; PsyDis = psychological distress; Support = Co-worker support.

**FIGURE 2** | Interaction between PSC and Co-worker support on work engagement among Australian sample.

find evidence that the understanding of PSC is largely invariant across nations. For the first time, we examined the measurement invariance of the PSC-12 scale across nations and suggest that the scale shows measurement invariance and therefore could be used to assess PSC in other countries.

In addition, our findings provide extended evidence that the proposition that PSC is associated with work conditions and psychological health holds true in different nations. This suggests that the theory of PSC can be applied to other countries as an indicator of healthy workplaces and as an antecedent to workers' psychological health. The positive impact of PSC suggests its usefulness for workers from all different backgrounds.

In relation to the moderation of PSC, the current findings expand our previous understanding of the PSC moderating effect and suggest that rather than a bolstering effect, PSC is a compensatory resource for co-worker support (Ji et al. 2025; Loh et al. 2018). High levels of PSC can compensate for co-worker support as the impact of co-worker support on psychological distress is diminished if one is situated in a high PSC context. Put simply, in conditions of low co-worker support, which could reflect a stressful situation where workers did not obtain adequate resources and violates their sense of belonging, workers would be less affected if a high level of PSC exists. However, the current findings also suggest that the role of PSC might not always be consistent with different outcomes across

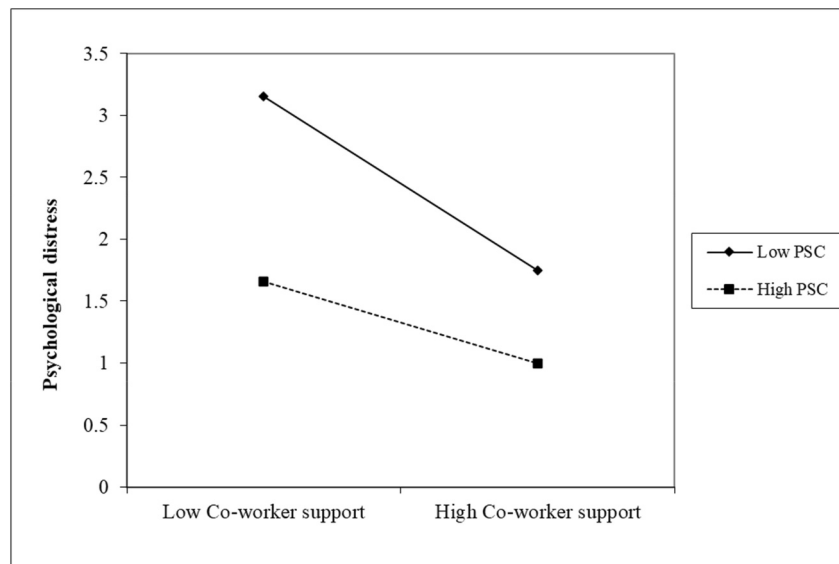


FIGURE 3 | Interaction between PSC and Co-worker support on psychological distress among Australian sample.

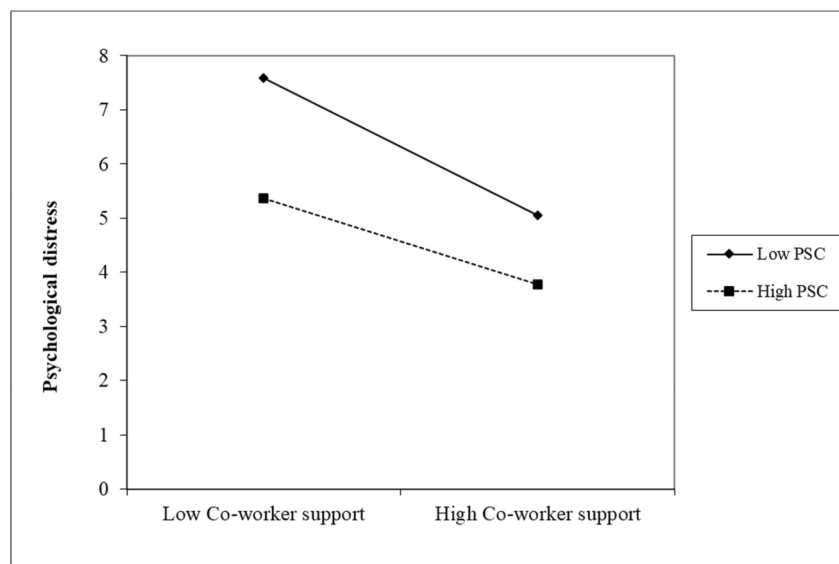


FIGURE 4 | Interaction between PSC and Co-worker support on psychological distress among Japanese sample.

nations, with only significant moderation results found for work engagement in the Australian sample.

6.4 | Practical Implications

Practically, occupational health researchers and practitioners are looking for evidence to understand the status of workers worldwide. To achieve this, they refer to organisational theories and literature, as well as using the existing instruments to assess and measure the conditions of work and workers. A cross-national generalisable theory and instrument is therefore useful and important (Meuleman et al. 2023; Vandenberg and Lance 2000). If a construct fails to be generalisable and is conceived differently by people from different backgrounds, in other words, there is measurement non-invariance, it might not provide accurate comparable information (Maassen et al. 2023; Meuleman

et al. 2023). Because the construct is conceived similarly across countries and there are consistent positive influences of PSC on workers' psychological outcomes and work engagement, PSC could be used as a main target for workplace psychological health interventions for both national and multi-national organisations (Berglund et al. 2024; Loh et al. 2024).

At the organisational level, interventions in improving psychosocial work environment, such as PSC, are much less common than individual interventions (Aust et al. 2023). Yet since an intervention that targets PSC can affect downstream factors like co-worker support, distress, and engagement, it is arguably more effective to implement an organisational intervention to improve PSC. For multi-national organisations, designing an intervention that works across all branches in different national locations is challenging given that the work conditions might be affected by different national policies, regulations, and practices.

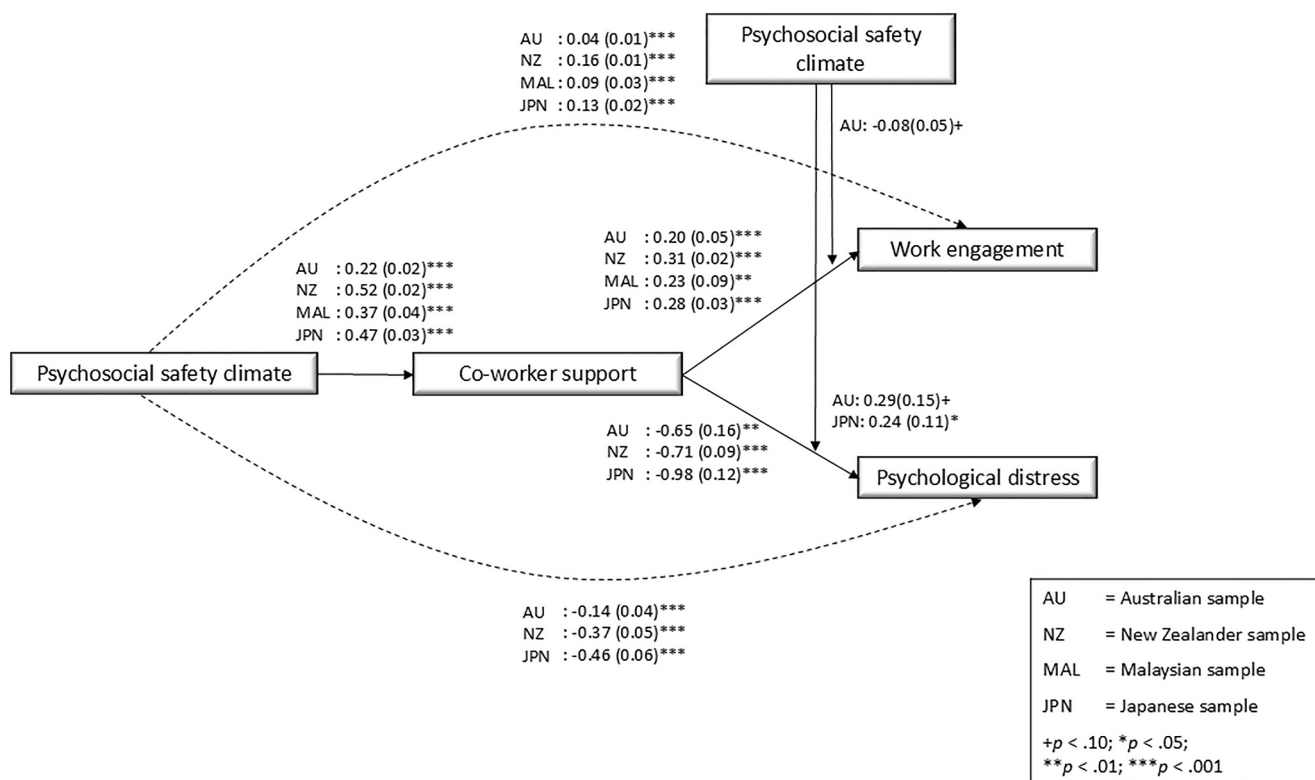


FIGURE 5 | Results model of the current study.

While interventions often require context-specific adoption to tailor to the needs of individuals and national policies requirements, having an overarching theory like PSC is beneficial in guiding the general direction and targeted elements in the intervention. Regular assessment of PSC would be beneficial for monitoring the trend of PSC in organisations over time and informing intervention acts accordingly. Nevertheless, since measurement invariance is established in the four nations, it is proposed that the continuation of measuring PSC in organisations across nations, particularly in multinational organisations of similar organisational culture, may provide useful findings on the generalisability of PSC in those organisations.

At the national level, establishing the universal importance of PSC theory across different countries highlights the need to promote psychologically healthy workplaces by focussing on the PSC alongside psychosocial risks in national policy. Our findings support the call for national policymakers to focus on the prevention of psychosocial risk factors (such as poor support) in their national laws, regulations, and occupational health systems (Potter, Dollard, et al. 2024; Rugulies et al. 2023; P. A. Schulte et al. 2024). A few national guidelines and standards are good examples, such as the UK Health and Safety Executive Management Standards for psychosocial work risks, the National standard for Canada for psychosocial health and safety in the workplace, and the Stress Check Programme in Japan (see P. A. Schulte et al. 2024). We further call for national policy to explicitly require the assessment of PSC as the foundational elements for risk prevention, which includes management commitment and support, communication, and consultation processes. In relation to work health and safety (WHS)

implementation guidelines, the Victorian state government in Australia recently mandated written prevention plans for psychosocial hazards which require the employer to detail the risks associated with identified psychosocial hazards, the relevant control measures, implementation plans, and the consultation process. They explicitly advocate for the use of the PSC tool in their code of practice (OSH Alert 2025).

6.5 | Limitations and Future Considerations

To date, there are over 250 empirical studies on PSC across 30 nations (Afsharian et al. 2024). Within these studies, there is general support for the theoretical assumptions regarding how PSC links to psychosocial risks and outcomes (Amodu et al. 2023; Loh et al. 2020). Nevertheless, this is the first study to empirically test the invariance of the measure (i.e., the PSC-12 scale) and theoretical relationships cross-nationally using multigroup analysis. Yet, a few limitations in the current study should be mentioned. Previous qualitative research in Sweden and Germany has investigated cross-national interpretations and responses to the items on the PSC-12 scale and raised issues such as how items are interpreted, possible redundancy of items, and response formats (Berthelsen et al. 2019; Ertel and Formazin 2019). Accordingly, these scholars made slight modifications to the scale's items and have proposed a few suggestions to improve the scale in these countries. Even so, quantitative studies in Sweden and Germany show that the translated PSC scales relate to burnout, stress, and engagement in expected ways (with the PSC-4 - the short version of PSC-12, Berthelsen et al. 2020; Formazin et al. 2022) which may suggest

that the adapted version of PSC scales does not change the central idea of what PSC is. However, we recognise that the in-depth information they obtained from interviews is beyond the scope of a quantitative survey as in the current study. Future international comparative research could investigate PSC using multiple methods including qualitative interviews, policy analysis, and experts' judgements to gain deeper understanding.

By establishing measurement invariance, one would desire to make comparisons on the construct's observed means across nations. We had the same initial idea; however, we recognised that there were a few additional caveats concerning the comparison, including the years of data collection, imbalanced sample size, and the Japanese sample being mostly small and medium enterprises. Another issue is the potential within-country variation and the fact that we only have four nations in the current study. We will suggest future research to discuss the levels of PSC with more representative samples across multiple nations. Nonetheless, some scholars of psychological methods and cross-cultural studies have argued that the literature has not yet articulated an effective way to compare observed means across different groups (Luong and Flake 2023). Therefore, there is also a need to explore more advanced and sophisticated methodologies to conduct adequate group comparisons.

The Malaysian sample was comparatively small, despite efforts to approach as many workers as possible to obtain a population-based sample. The low response rate in paper-and-pen surveys has been observed in other Malaysian studies (e.g. Idris et al. 2014). A post-hoc power test using this sample size and correlations confirmed that the statistical power for a p -value at 0.05 is adequate for statistical analysis and not likely to affect results (Power = 1.00). Nevertheless, future research could try different ways of collecting data (e.g., online survey) with other strategies (e.g., honorarium) to encourage participation. The low reliability of the K-6 psychological distress scale in Malaysian sample was also unexpected given that K-6 has been widely used as a validated scale in many countries, including Malaysia. There are a few possibilities as to why a low Cronbach's alpha was found, including translation issues, response bias, and sample representativeness. Although we followed the best practice in the translation process, there might be a need to do a cultural adaptation for the Malaysian culture. An example of this is the Mayi Kuwayu Survey (MK-K5), the culturally adapted Kessler's scale for Australian Aboriginal and Torres Strait Islander people (Brinckley et al. 2021).

While many past studies have studied PSC within the JD-R theory using a multi-level perspective, the current study investigated it as a psychological construct. While examining psychological PSC is a valid approach and worth investigation, we did not manage to compare both individual-level and group-level effects as suggested as by Baltes et al. (2009) and M. Schulte et al. (2009), nor control for organisational influences. Future studies are encouraged to analyse cross-nationally, how PSC functions and its meaning at the individual level, as well as within group and organisational contexts. This is particularly important for understanding the moderation effect of organisational PSC on individual's perceived work conditions and their health.

The study is limited in the type of resources assessed and its samples were all drawn from the Asia Pacific region. Given that there are other types of psychosocial risk (e.g., poor job autonomy, emotional demands, work overload, digital demands; see Schaufeli and Taris 2014 for a list of examples) we encourage researchers to conduct similar comparative studies to investigate whether the etic assumption for PSC theory holds for other psychosocial risk factors. Moreover scholars have found a strong association between PSC and national work health and safety policy and regulations framework (Potter, Dollard, et al. 2024; Potter et al. 2025), which implies that national governance on workplace psychosocial risks (Leka et al. 2011), workers' health and safety, and workers' compensation systems could improve (or reduce) PSC. Therefore, future research should also explore the link between national WHS systems and their influence on PSC and workers' outcomes cross-nationally to investigate further how different regulations and socio-political systems operate in relation to PSC theory.

7 | Conclusion

Through measurement invariance and nomological network tests, our study shows that the PSC-12 scale likely captured a similar construct meaning of PSC across nations through its four dimensions. The current study indicates that the functions of PSC within both the motivational and health erosion pathways of the JD-R theory are likely the same across Australia, Japan, Malaysia and New Zealand. We found that PSC is positively related to co-worker support and, in turn, negatively related to psychological distress and positively related to work engagement. Although there was some evidence of the moderation of PSC, further validation and testing in multilevel longitudinal multinational frameworks is required.

Author Contributions

All authors contributed to the study conception and design. The first draft of the manuscript was written by M.Y.L. and M.C.C.L., M.D., and K.K., M.Y.L., M.C.C.L., M.D., K.K., D.T., D.G., and T.B. reviewed and revised the manuscript. Material preparation and analysis were performed by M.Y.L. Data collection was performed by A.A., K.K., T.T., M. A.I., T.B., D.F., D.T., D.G., M.D., A.N., and T.B. acquire fundings. All authors commented on the various versions of the manuscript. All authors read and approved the final manuscript.

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Ethics Statement

Study procedures were approved by relevant institutions and countries.

Consent

All participants were given a participant information sheet and participated voluntarily in the study. Participants could also end their participation at any point of the study without any penalty.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The datasets generated and/or analysed during the current study are available from the corresponding author in response to a reasonable request.

Endnotes

¹ As part of our initiative to do a multinational comparison, we called for global collaboration at an international conference and through our networks. Four datasets were obtained as a result of the call.

² The reliability of the three-item Ultra Short Utrecht Work Engagement Scale was reported as slightly lower than the conventional 0.80 threshold. However, many researchers have observed a similar level of reliability for this scale (e.g., Schaufeli et al. 2017, $\alpha = 0.77$ for Spain sample).

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