

The Efficacy of Stress Coping Strategies in Taiwan's Public Utilities During the COVID-19 Pandemic

1. INTRODUCTION

Organizations that provide essential services to the general public comprise the public utility sector (PUS). Critical services, such as the provision of water, gas, electricity, transportation, and communications, cannot be eliminated without significantly impairing the community's ability to conduct business and live comfortably. Because of how essential these services are to the public, any disruption in their provision would cause havoc with daily life in the neighborhood. Taiwan's utility sector employees have recently come under fire from the public, likely owing to the public's long-held negative perception of Taiwan's PUS (Cheng, 2015). Government pricing policies or social agendas may have hampered or damaged managerial performance. PUS in the regions also provides social services such as public transit, health care, education, and utility services. Higher service costs emerge from these service expenses.

Furthermore, PUSs are dealing with intense structural and employee management due to COVID-19. As a result of these dynamics, utility performance is becoming increasingly reliant on employees' responsive and reflective activities in terms of job performance. The COVID-19 pandemic has significantly impacted global society (Chuenyindee et al., 2022). In a survey released by the National Suicide Prevention Center, approximately half of the respondents said that the COVID-19 outbreak had caused them stress in Taiwan (Taipei Times, Sep/06/2021). A study on nurses' and student nurses' emotional reactions and coping strategies during the COVID-19 epidemic in China discovered that both groups employed problem-focused strategies more often than emotion-focused ones (Huang, Xu, & Liu, 2020). In a systematic review, the overall prevalence of psychological effects varied between countries from 30 to 40% (Wu, Jia, Shi, Niu, Yin, Xie, & Wang, 2021). According to a recent study, infectious

disease outbreaks affect all individuals profoundly psychologically, not only those who already have mental problems. According to this investigation, domestic Taiwanese respondents experienced less stress than their overseas counterparts and may have relied on government-related coping strategies during the early phases of the COVID-19 pandemic (Chen, Wu, Yeh, & Wang, 2022).

During the COVID-19 pandemic, scientific investigations found a substantial correlation between psychological variables and self-efficacy (Shacham, Hamama-Raz, Kolerman, Mijiritsky, Ben-Ezra, & Mijiritsky, 2020). Workplace stress can lead to a variety of behavioral issues. Overworked stress has been linked to psychological issues, including depression, anxiety, and burnout, as well as organizational issues like unproductive working behaviors (Saleem, Malik, & Qureshi, 2021). There have been many studies on stress coping strategies and how they affect working behaviors in various stressful conditions. A range of characteristics are controlled by coping strategies among employees, according to a recent study on workplace stress, including personality traits and work attitude (Hsieh, 2004; Siu, Lu & Cooper, 1999; Hu & Cheng, 2010), coping experiences (Chang & Lu, 2007; Siu, Spector, Cooper, Lu & Yu, 2002; Zheng, Kashi, Fan, Molineux, & Ee, 2016), and job-worksite characteristics (Li, Lee, Lee, Chen & Chi, 2001; Mao, 2003; Murray, & Ali, 2017). These studies scrutinized the nature of the moderators mentioned above and attempted to address their impact on stress consequences. The impact of the COVID-19 epidemic on PUS's employees, notably in Taiwan, is little understood. Due to the heterogeneity of research purposes, the findings of these studies are somewhat inconclusive, and the understanding of the efficacy of specific coping strategies is limited. Despite numerous studies in other contexts, there is, to our knowledge, relatively little information regarding the particular stress coping strategies utilized during COVID-19 regarding the PUS.

This research, therefore, aims to examine the efficacy of specific stress coping strategies at work by examining which strategies are effective or ineffective in stress alleviation. The findings will enhance the knowledge of stress coping strategies and assist HR practitioners in better understanding the stress coping experiences of their employees. Further studies on the efficacy of specific stress coping strategies

in the country may help enhance PUS management, particularly during the COVID-19 crisis. Thus, we describe our study designed to test our hypotheses. Section 2 summarizes the argument about stress and coping strategies and discusses some underlying issues affecting the relationship. Section 3 discusses the research method and scales. Sections 4 and 5 present the research analyses, discussions, and results. The paper ends with a few concluding discussions.

2. Occupational Stress and Coping Strategies

Because of isolation, understaffing (Shen et al., 2019), and demands on labor, job stress and burnout have grown throughout the COVID-19 pandemic (Simionescu et al., 2022). PUS's employees were more stressed due to having to convene online meetings and working longer hours. Employees may choose to work in a different sector or occupation during the pandemic to avoid pandemic issues such as infection fear and exhaustion. Employees prepared to engage in work are constrained by the challenging working environment of the pandemic (Prasetyo, Montenegro, Nadlifatin, Kurata, Ong, & Chuenyindee, 2022). This study's importance should be investigated to beat COVID-19 for PUS's stress coping management.

Occupational stress is distinct from other types of stress due to the nature of the stressors and how they interact with the overall stress process (Simionescu, Bordea, & Pellegrini, 2022). Occupational stresses can occur in many ways (e.g., workload, coworker and employer relationships), and the negative consequences of these can be mitigated by both individual (i.e., personality, personal stress tolerance levels) and organizational factors (i.e., supervisory support, sense of teamwork) (Giauque, Anderfuhren-Biget, & Varone, 2019).

Coping strategies are proactive behaviors people use to cope with stress once exposed to environmental pressure or the perception of risk from stressors. Cooper (1996) asserted that coping strategies include social support, task strategies (such as time management and delegation), logic (such as prioritization), time, and engagement. All of these factors act as important external, problem-focused stress stabilizers and so help to reduce stress. Cooper (1996) further said that coping strategies reduce

perceived stress by mitigating the adverse effects of work-related sources of pressure. Coping strategies also add to a person's sense of physical well-being and allow them to maintain job satisfaction. Morris and Long (2002) discovered that those who use coping strategies are less likely to have physical symptoms of stress, including hypertension and migraine headaches.

However, the empirical relationship between coping strategies and perceived stress is inconsistent. There are two main perspectives; firstly, the association between coping strategies and personal stress perception is not simple and involves many latent factors, such as personal coping experiences and personality traits (Heslop, Smith, Metcalfe, Macleod & Hart, 2002; Zheng, Kashi, Fan, Molineux, & Ee, 2016); secondly, coping strategies, workplace leadership, and organizational support do not attenuate stress, even though these characteristics are linked to both individual and organizational well-being (Dobrevna-Martinova, Villeneuve, Strickland & Matheson, 2002; Giauque, Anderfuhren-Biget, & Varone, 2019). Tyson et al. (2002) also indicated that although avoidance and social support are correlated with individual perceived stress as coping strategies, neither reduces perceived stress at the organizational level.

Numerous studies have been conducted on coping strategies, and numerous arguments have been made regarding the best method to categorize them in terms of their functions and effectiveness. One of the most often used frameworks for evaluating the range of stress coping behaviors is Lazarus and Folkman's (1984) typology, which compares problem-focused (PF) with emotion-focused (EF) techniques. PF techniques emphasize direct and proactive behaviors intended to eliminate or lower stress, whereas EF strategies emphasize limiting the detrimental psychological and emotional impacts of stressors on individuals. Nevertheless, both strategies can be used in the same situation.

However, the effectiveness of PF/EF approaches has been the subject of conflicting opinions. Some scholars suggest that PF strategies are related to more negative outcomes, whereas EF strategies are attributed to more positive consequences (Huang, Xu, & Liu, 2020). For instance, Pearlin, Aneshensel, and LeBlanc (1997) found that PF strategies were related to higher stress levels among the unemployed.

Leana and Feldman (1995) suggested that emotional distancing (an EF strategy) was related to reemployment, while Gowan *et al.* (1999) claimed that emotional distancing was correlated to lower levels of distress and higher levels of reemployment. Miller and McCool (2003) found that direct action intended to influence stressful situations (a PF strategy) was related to elevated stress levels.

Interestingly, another amount of evidence implies that PF techniques are connected with beneficial results, whereas EF tactics are related to adverse outcomes. For instance, active attempts to modify the surroundings, according to Feldman and Tompson (1993), minimize sources of pressure, whereas passive attempts to deal with the negative repercussions of stress sap an individual's energy without truly influencing or alleviating the issue (Giauque, Anderfuhren-Biget, & Varone, 2019). Sandler *et al.* (1994) claimed that PF strategies were most commonly employed in situations where there was a belief that the sources of stress could be affected. EF strategies are more likely to be adopted when the situation appears unchangeable. Subsequently, poor EF strategies may add to the harmful effects of stressors.

2.1 Adoption of Coping Strategies

The scientific results on the coping strategies used by workers in industrialized economies (e.g., the United Kingdom, the United States, and France) are equivocal. According to Dewe *et al.* (1993), asking for help (e.g., conversing with senior colleagues) and seeking professional assistance (e.g., seeing a therapist) are viable coping strategies for buffering stress hazards. Both asking for help and seeking professional aid reduce perceived stress levels by decreasing the effect of stressors. According to Davidson *et al.* (1995), social-assistance (e.g., conversing with confidantes, family members, and close coworkers) and gaining spiritual (or material) support from interpersonal social networks are effective ways to reduce stress levels (Lu, Wang, Wang, Guo, & Pan, 2022). However, in some cases, too much social support (e.g., additional care and attention) can be a source of pressure, increasing stress levels (Chang & Lu, 2007).

Cooper (1996) argued that social assistance and group discussions (e.g., stress intervention) are effective strategies for reducing stress. Similar findings have been found in more recent studies, although

these studies are carried out in different regions and industries (e.g., Miller & McCool, 2003; Morris & Long, 2002; Keech & Hamilton, 2021). On the other hand, Terbourg (1985) conducted a stress investigation in police and army organizations, finding that environmental factors have a predominant role in the perception of stress, such as bureaucratic management style or unilateral communication channels.

In terms of the coping strategies used by workers in developing nations (e.g., Taiwan, Philippines, and Indonesia), Siu *et al.* (2002) discovered that Taiwanese managers reported more frequent use of control coping and support coping than their Hong Kong and Chinese counterparts because Taiwanese managers perceived more sources of pressure (e.g., Westernized influences at work, Taiwan-China political impasse) and therefore felt the need to utilize more coping strategies in order to deal with stress. Yu *et al.* (1998) suggest that coping support acts as a moderator and buffers the stress impact among workers and managers in steelworks in China. Moreover, during the COVID-19 epidemic in China, nurses and nursing college students utilized problem-focused coping strategies more often than emotion-focused ones (Huang, Xu, & Liu, 2020).

A comparative field study by Selmer (2002) reported that, in Chinese organizations, Chinese expatriates use PF coping strategies less often than Western expatriates. Unlike Western samples, probing the sources of problems or discussing solutions with colleagues were not common strategies employed among the Chinese samples. Selmer indicated that Chinese expatriates use more EF strategies, such as showing more tolerance and patience or resorting to escapism. Hong Kong employees utilize fewer PF strategies than their American and French peers. According to Selmer, this is because people from Hong Kong feel either despised or envied by employees from mainland China and therefore suffer more pressure at work, which cannot be alleviated by using PF strategies.

Another investigation among primary care nurses in Hong Kong (Lee, 2003) revealed an inverse relationship between stress at work and coping by direct action (a PF strategy). Lee claimed that palliative strategies, which are conceptually similar to EF strategies, have neither a positive nor a negative effect

on stress.

In addition, Siu, Spector, and Cooper (1999) conducted a comparative stress investigation and found that self-help was a common stress coping strategy among Taiwanese employees and their counterparts recruited from Hong Kong and Western countries. Interestingly, compared to their counterparts, social assistance (e.g., asking for help or seeing a counselor) was unusual behavior among Taiwanese employees. Lu, Tseng, and Cooper (1999) discovered that self-help was frequently used by Taiwanese employees and contributed to predicting perceived stress levels. Li *et al.* (2001) also stated that the efficacy of self-help and social assistance is mediated by past coping experiences, job tenure, and characteristics.

2.2 Efficacy of Single versus Dual Coping Strategies

The implied theme of previous research is that various circumstances influence the efficacy of a stress coping strategy; namely, coping strategies may not alleviate the perception of stress. Although prior findings are valuable, the efficacy of coping strategies remains nebulous, which cannot contribute to the amalgamation of different coping theories, nor can it help general employees adopt effective stress management strategies. Due to this concern, this study aims to determine the efficacy of particular stress coping strategies in the workplace, i.e., which strategies are helpful or ineffectual at reducing stress. The findings should also provide more insight into the intricacies of the coping mechanisms, which provide concrete, reliable, and important implications for stress scholars and intervention programs.

Additionally, studies have shown that coping strategies among general workers are regulated by several attributes, such as personality traits and work attitude (Hsieh, 2004), coping experiences (Siu *et al.*, 2002), social support (Lu, Wang, Wang, Guo, & Pan, 2022), and job-worksite characteristics (Li *et al.*, 2001; Mao, 2003). These findings imply that the efficacy of a specific strategy may be affected by other strategies adopted at the same time. Another issue to be borne in mind is that Terbourg (1985) also explains that a stressor may rarely have a simple solution, resulting in single, specific coping strategies unable to alleviate all of the levels of perceived stress differentially. When putting Terbourg and other

scholars' findings together, a message has emerged; that is, using more than one coping strategy may help alleviate the levels of perceived stress; this assumption requires further examination. Thus, this study also intends to analyze the efficacy of dual strategies and evaluate how the interplay of strategies enhances or works against stress intervention.

3. THE CURRENT STUDY

Adopting an appropriate measurement of coping strategies is crucial. Hence, after comparing several existent scales, this study adopts the Occupational Stress Coping Scale (OSCS: Chang & Hargreaves, 2006). The rationale underlying this decision follows. To begin with, the OSCS was established based on the PF-EF framework (Lazarus & Folkman, 1984). Compared to the PF-EF typology, the OSCS has a broader coverage of strategies, as it comprises five discrete strategies, each having three specific strategies (See Table 1). Another reason is that, compared to its counterparts (e.g., *Occupational Stress Indicator*, Cooper, Sloan & Williams, 1988; *Brief COPE Inventory*, Carver, 1997), the OSCS has a user-friendly interface. The scale is shorter, as it only contains fifteen items.

Insert Table 1 Here

Specifically, the OSCS comprises five heterogeneous sorts of copying strategies; *self-help*, *belief-change*, *avoidance*, *social-assistance*, and *group-intervention*. Concerning the nature of these strategies, several preliminary suppositions were established after examining the items within each specific type of strategy. A proactive mindset and a readiness to detect the existence of stress are required for the self-help strategy to begin. It aids individuals in comprehending the sources of stress, which helps to reduce stress awareness. The strategy of belief-change provides an extra chance for people to assess the sources of stress from many viewpoints. This method encourages people to think about pressure more positively, which lessens stress. Unlike the other strategies, the *avoidance strategy* ignores the sources of pressure. As the sources may not disappear in a vacuum, stress can only be reduced temporarily but accumulated at a later stage.

In the group-intervention and social-assistance strategies, individuals plan to share (or forward) the stresses with others, for example, by asking (or expecting) others to aid them in managing stressors. Using such strategies implies that, in some capacity, people must depend on others for intervention and coping advice. As such strategies involve others, the dynamic of stress coping may become complex, and the efficacy of the alleviation may thus be compromised.

Given this background, a hypothetic framework is proposed, in which three specific hypotheses are embedded (See Figure 1). Based on literature reviews, we hypothesized that the efficacy of coping strategies relies on the psychological coping mechanism of each specific strategy. To be specific, these hypotheses are:

Insert Figure 1 Here

H₁: Self-help and belief-change strategies may alleviate perceived stress.

H₂: Avoidance strategy may aggravate perceived stress.

H₃: Social-assistance and group-intervention strategies may not alleviate perceived stress.

In addition, this research is keen to explore the efficacy of dual strategies simultaneously. As aforementioned, the efficacy of using two different strategies depends on the nature of each strategy adopted, which may not necessarily state the exact direction of stress intervention. For this concern, this research thus did not propose specific hypotheses for using dual strategies. This research adopts a more exploratory approach so the exact direction of stress intervention can be better analyzed; that is, the efficacy of using dual strategies concurrently can be better understood.

3. METHOD

3.1 Sample and Procedure

Notwithstanding varied adopted tactics, COVID-19 has had an unprecedented influence on practically every area of global society (Prasetyo, Montenegro, Nadlifatin, Kurata, Ong, & Chuenyindee, 2022). Notably, employees of the PUS were negatively impacted by the social contact restrictions.

Whether one commutes to work or works from home, the COVID-19 pandemic has undoubtedly affected work habits. Furthermore, occupational stress might result in burnout. How people deal with these feelings and stress may impact personal health, well-being, and employment, with societal implications. Serving during the COVID-19 pandemic is particularly difficult for servants because they are exposed to physical and social effects while continuing their everyday routines, which is accompanied by excessive pressure (Shoaib, Nawal, Korsakienė, Zámečník, Rehman, & Raišienė, 2022). Unlike private sectors, PUSs are required to operate according to government policy (Cheng, 2013). After many years of working within a rigid administration (Cheng, 2015), employees in these utility sectors are unlikely to be flexible or reactive to the challenges of the COVID-19 pandemic. However, due to time and cost limitations, four heterogeneous utility sectors (samples) were recruited (Taiwan Power Company, Taiwan Water Corporation, Taiwan Railways Administration, and CPC Corporation, Taiwan), as these were the largest employers in the sector. By the end of 2021, there were 363,000 civil servants in Taiwan, but there were 60,000 employees in public enterprises, accounting for 16.4% of the public servants. There was an annual decrease of 0.9% in public enterprises. Taiwan Power Company, Taiwan Water Corporation, Taiwan Railways Administration, and CPC Corporation of Taiwan had 23392, 5495, 15981, and 16293 employees, respectively, more than half of public enterprises.

The snowball approach was used to contact respondents through HR managers or administrative assistants in each utility sector. Questionnaires were given in booklets with a cover letter promising confidentiality and a consent form. A reminder letter was issued seven days following the original invitation to increase the response rate. Three weeks later, the questionnaires were submitted back to the investigators. A total of 1000 questionnaires were issued; 769 were completed, with 678 being used, resulting in a 67.8 percent total response rate. The highest respondents were Taiwan Power Company employees ($n_1 = 188$) and Taiwan Water Corporation employees ($n_2 = 180$), followed by Taiwan Railways Administration employees ($n_3 = 165$) and CPC Corporation, Taiwan employees ($n_4 = 145$). No between-group difference was found ($\chi^2(3, N = 4) = 4.89, n.s.$).

3.2 Measures

The Occupational Stress Coping Scale (OSCS; Chang & Hargreaves, 2006) was used to assess stress coping strategies. The OSCS comprises five primary stress coping strategies, each with components (See Table 1). Every scale item was accompanied by a stem: *Which of the following strategies do you adopt to cope with job stress?* Responses were assessed on a five-point *Likert* scale (*1 = Never; 5 = Always*). Internal consistency for these five coping strategies was adequate; particularly, social-assistance (*Cronbach $\alpha = .85$*), self-help (*Cronbach $\alpha = .83$*), group-intervention (*Cronbach $\alpha = .77$*), avoidance (*Cronbach $\alpha = .76$*), and belief-change (*Cronbach $\alpha = .78$*). The overall internal consistency was acceptable ($\alpha = .75$).

The Occupational Stress Indicator (Cooper, Sloan, & Williams, 1988) was used to assess *occupational stress* by allowing respondents to rate which items (i.e., work stressors) they considered stressful. Sample items included: “inadequate feedback about my own performance” and “lack of consultation and communication.” Responses were measured on a 6-point *Likert* scale (*1 = Very definitely is not a source, 6 = Very definitely is a source*). Internal consistency was satisfactory (*Cronbach $\alpha = .83$*).

The cross-sectional approach raises the potential of bias due to the common method variance (CMV) (Podsakoff, MacKenzie, & Podsakoff, 2003). A Social Desirability Scale (SDS; Reynolds, 1982) was also incorporated as a marker variable), and the Pearson equation was used to calculate the correlation coefficients among SDS and all variables (see details of CMV remedies in Podsakoff et al., 2003). The coefficients varied from .17 to .29, with no values near to or exceeding .70, suggesting that the likelihood of CMV bias in the present study is relatively low.

4. RESULTS

4.1 Demographics

The mean age of the whole respondents ($N = 662$) was 33.98 years old ($SD = 8.10$). The gender ratio

was: male (42.45%) versus female (57.55%), which is nearly in line with the gender distribution in Taiwan's public enterprises. The mean job tenure was 8.49 years ($SD = 7.64$). Marital status was stratified as single (42.00%), married (50.90%), and others (7.10%). Educational levels were stratified as high school (10.73%), graduate (74.77%), and postgraduate (14.50%). As no significant differences in demographic characteristics across four utility sectors were detected, the four utility sectors were merged for further statistical analysis.

Stress Coping Strategies

Findings revealed that the social-assistance strategy ($M = 1.98, SD = .58$), group-intervention strategy ($M = 2.02, SD = .97$) and avoidance strategy ($M = 2.14, SD = .71$) were *less* frequently-used strategies, whereas the self-help strategy ($M = 3.34, SD = .71$) was a *more* frequently-used strategy (See Table 2). These values are frequency variances but not in absolute terms.

Insert Table 2 Here

In respect of frequency variances, additional research revealed that five distinct strategies exhibited statistically significant differences ($F(1, 320) = 32.05, p < .001$; *Levene's Test* $< 1, n.s.$). More notably, the least employed technique was the social-assistance strategy ($M_{diff} = .52, p < .001$), where self-help strategy ($M_{diff} = .62, p < .001$) and belief-change strategy were the most frequently used ($M_{diff} = .81, p < .001$). In contrast with their counterparts, the self-help and belief-change strategies were the most prevalent tactics.

In terms of associations among strategies, social-assistance strategy was favorably associated with self-help strategy ($r = .26, p < .01$). Group-intervention strategy was positively linked to social-assistance strategy ($r = .27, p < .01$), self-help strategy ($r = .28, p < .01$), but negatively related with avoidance strategy ($r = -.17, p < .01$), respectively. Interestingly, the belief-change strategy was not linked to any other strategies, including: social-assistance strategy ($r = .02, n.s.$), self-help strategy ($r = .06, n.s.$), group-intervention strategy ($r = .08, n.s.$), and avoidance strategy ($r = .10, n.s.$). Perceived stress was

adversely associated with self-help strategy ($r = -.28, p < .01$), group-intervention strategy ($r = -.17, p < .01$), belief-change strategy ($r = -.13, p < .05$), but positively correlated with avoidance strategy ($r = .17, p < .01$). These statistical figures reveal that, in general terms, the more people adopt self-help strategy, group-intervention strategy, and belief-change strategy, the less they feel stressed, and vice versa. The more individuals use the avoidance strategy, the more stressed they get, and vice versa.

4.2 Efficacy of Coping Strategies

A hierarchical moderated multiple regression analysis was used to investigate the relationship between perceived and coping strategies. Compared to the traditional multiple regression analysis, such analysis alleviates the influence of multi-collinearity and better reflects the reality across the variables examined (Aiken & West, 1991). The dependent variable (i.e., perceived stress) was analyzed, and the corresponding variable blocks were inserted in the sequence listed below. In step one, demographic characteristics (such as age, gender, and educational levels) were all entered at the same time. In step 2, five coping strategies were recorded concurrently. Three demographic characteristics ($F(5, 655) = 4.55, p < .001$) and three coping strategies ($F(10, 650) = 8.58, p < .001$) strongly predicted the degrees of perceived stress, as shown in Table 3. Diagnostics for multi-collinearity revealed that it was not severe (*Condition Index* = 27.26).

Insert Table 3 Here

Female workers were more likely to become stressed in the workplace ($\beta = .10, p < .001$), whereas employees with greater levels of education had less stress at work ($\beta = -.09, p < .001$). Three coping strategies were identified as valid predictors of stress, either mitigating or exacerbating it. These include avoidance strategy ($\beta = .22, p < .001$), self-help strategy ($\beta = -.14, p < .001$), and belief-change strategy ($\beta = -.09, p < .001$).

These statistical figures confirmed three key results. First, self-help and belief-change strategies can help to reduce the degree of stress perceptions. Second, using an avoidance strategy might exacerbate stress levels. Third, the social-assistance and group-intervention strategies may not significantly affect stress alleviation. These three findings have provided preliminary evidence to support the research hypotheses (H1, H2, and H3).

4.3 Efficacy of Dual Strategies

A multiple regression analysis was conducted to explore the efficacy of dual strategies simultaneously, with stress as a dependent variable and dual-strategies predictors. As there were five strategies, the interaction matrix was relatively large, that is, 1x2, 1x3, 1x4, 1x5, 2x3, 2x4, 2x5...(ten possibilities of interactions in total). For clarity, only the significant predictors were reported and analyzed here (See Table 4). Three interactions were shown to be reliable predictors of stress alleviation or aggravation.

Insert Table 4 Here

These are: Social-assistance strategy/Group-intervention strategy ($\beta = .39, p < .001$), Self-help strategy/Group-intervention strategy ($\beta = -.35, p < .001$), and Self-help strategy/Avoidance strategy ($\beta = .31, p < .001$). Collinearity diagnostics showed that multi-collinearity was not severe (*Condition Index* = 6.21). According to these statistics, using social-assistance and group-intervention strategies simultaneously, as well as self-help and avoidance strategies, aggravated the levels of experienced stress. The levels of perceived stress can only be reduced when self-help and group-intervention strategies are used simultaneously.

4.4 Additional Analyses

Previous research found that demographic factors and coping strategies influenced subjective stress levels, whether alleviated or increased. For this reason, we examine further how these variables interact

in terms of stress alteration. Only the main results from a series of studies are provided and discussed here.

To begin with, both educational levels ($\beta = -.10, p < .01$) and self-help strategy ($\beta = -.15, p < .01$) predicted the levels of perceived stress. Their interaction also had negative prediction ($\beta = -.17, p < .001$). These results demonstrate that educational attainment influenced the relationship between self-help strategy and stress perception. That is, higher educational levels enhanced the efficacy of self-help \in stress reduction.

Moreover, analyses found that both gender ($\beta = .09, p < .01$) and avoidance strategy ($\beta = .21, p < .001$) predicted the levels of perceived stress. Their interaction also had negative prediction ($\beta = -.21, p < .001$). These figures indicate that gender moderated the nexus between avoidance strategy and stress perception. That is, if the users of the avoidance strategy were male, they would feel less stressed (compared to their female counterparts).

Finally, both gender ($\beta = .09, p < .01$) and altering beliefs approach ($\beta = -.09, p < .001$) were shown to predict perceived stress levels. Their interaction also had negative prediction ($\beta = -.13, p < .001$). These statistics demonstrate that gender impacted the relationship between belief-change strategy and stress perception. Thus, male users of the belief-change strategy would experience less stress (compared to their female counterparts).

The findings in this research are many and vary, which are not only meaningful but also relevant to group leaders, organizational managers, and personal practitioners. We now turn to discuss these findings and critically evaluate their implications and contribution to the knowledge of stress coping strategies.

5. DISCUSSION

From the standpoint of organizational management, the objective of this research was to determine the efficacy of stress coping strategies at work, i.e., which specific strategies are genuinely helpful in stress relief. This research also attempts to assist managers and employees of PUS in improving their

understanding of stress-coping and recognizing which strategies should be used and which should be avoided.

In an idealistic situation, stress management measures would absorb the adverse effects of pressure sources, minimize the load of stressors, and ultimately aid in reducing perceived stress. Despite this, the five strategies (examined below) were not as successful as planned. New study results offer several crucial implications for understanding workplace coping strategies and contribute to the amalgamation of a theoretical framework for varied coping strategies. The following is an in-depth study of the new findings.

5.1 Efficacy of Coping Strategies in Utility Sectors

This research demonstrates that stress may be reduced by using *self-help* and *belief-change strategies*. This phenomenon can be interpreted as a positive and active approach (i.e., stress coping), as both self-help and group-intervention strategies indicate a hopeful outlook and a readiness to acknowledge the existence of stress. These two strategies, in general, assist PUS employees in identifying and removing stressors and reducing emotional distress such as melancholy, anxiety, anguish, frustration, or rage. Muscle exercises, religious activities, sports, driving, going to the movies, shopping, shouting, sobbing, karaoke, meditation, and reading stress-relief materials are all examples of the self-help strategy (Shepardson, Tapio, & Funderburk, 2017; Simionescu, Bordea, & Pellegrini, 2022). People can shift their concentration and relieve tension by participating in these activities. These activities also guide people to evaluate the reasons behind their feelings of stress, which helps them adjust their anxiety (or worries), thus buffering the perceived stress.

In principle, the belief-change strategy is akin to cognitive reframing, a comparatively modern strategy for teaching employees of utility sectors to re-think issues they cannot change. Similar strategies, such as improving psychological acceptance, emotional quotient, and adversity quotient, have lately been considered (Book & Stein, 2002). The thrust of the belief-change strategy is that, as people are seldom

capable of relieving all pressure, the only other option is to attempt to put barriers in place that will hopefully buffer the impact of stress. Simply, if individuals can erect a protective barrier to the appearance of stressors beforehand, they will experience substantially less stress when confronting them.

Interestingly, this study discovered that an avoidance strategy aggravates stress, which contrasts with the results of a recent study (Thai, Le, Huynh, Pham, & Bui, 2021). It is possible that utilizing an avoidance strategy entails avoiding or ignoring the stressors, and while this may initially make employees feel less worried, it does nothing to address the fundamental issue, making it unlikely to be successful over time. It is also possible that using such a strategy may only give a temporary illusion that pressure has disappeared. Sooner or later, pressure will return and impel employees to feel stressed again, as stressors do not just vanish.

Congruent with the research expectation, social-assistance and group-intervention strategies had no discernible impact on the alleviation or aggravation of stress. This phenomenon may have several implications. Firstly, if a strategy involves others or external assistance, the dynamic of stress coping may become complicated, and the efficacy of stress alleviation may not be straightforward. Secondly, these two strategies may not be valid for the employees of utility sectors in this research. Other stress-reduction strategies may exist, but they were not evaluated in this study. Finally, the overall stress levels in the present study were not particularly high, implying that these two strategies may not consistently achieve the best results. Conversely, the effectiveness may be modest and unobservable.

5.2 Analysis of Dual Strategies

When under stress, employees choose to focus on a single strategy rather than employing multiple strategies at the same time (Feldman & Tompson, 1993; Lazarus & Folkman, 1984). From an opposite perspective, however, Cooper, Sloan, and Williams (1988) claimed that people might adopt different strategies to tackle different sources of pressure, in which the adoption preferences are moderated by social support (Lu, Wang, Wang, Guo, & Pan, 2022), time, and involvement. Limited information is

available from these prior studies to understand the interaction between heterogeneous coping strategies (Keech & Hamilton, 2021).

Inspired by previous studies, this study aimed to extend the analytic scope by examining the interaction of heterogeneous strategies. Analyses revealed that the social-assistance strategy is positively correlated with the self-help strategy. The social-assistance and self-help strategies are significantly linked with the group-intervention strategy, whereas the avoidance strategy is adversely associated. This research demonstrates that, contrary to prior research (e.g., Lazarus & Folkman, 1984), diverse strategies do not necessarily stand alone and that individuals may use many strategies at the same time. At least in this study, it is evident that employees in utility sectors may use multiple coping strategies and that these strategies have a significant negative or positive association. The result is consistent with some studies (Huang, Xu, & Liu, 2020; Saleem, Malik, & Qureshi, 2021). For instance, the more people who use a group-intervention strategy, the more self-help and social-assistance strategies they use, but the less they use avoidance strategies.

Following research, it was discovered that dual strategies do not always reduce or increase levels of perceived stress. This research has scrutinized all interactions between five different coping strategies. However, interestingly, merely three strategies' interactions were shown to be meaningfully connected to differences in perceived stress. To be exact, self-help and avoidance strategies, as well as social-assistance and group-intervention strategies, can exacerbate the impact of cognitive stress in utility sectors. Stress can only be relieved when self-help and group-intervention strategies are used simultaneously.

These findings contain several key messages. First, using two strategies may not be beneficial, as picking the wrong strategy might be harmful and exacerbate strain (Thai, Le, Huynh, Pham, & Bui, 2021). Second, whether dual strategies support or work against stress alleviation is subject to the nature of the strategies. As shown in Figure 1, a proactive and positive attitude leads to better stress alleviation, whereas an aversive and negative attitude can worsen things. Thirdly, when it comes to stress

management in utility sectors, self-help is usually the most successful method (Shepardson, Tapio, & Funderburk, 2017), while an avoidance strategy is just the worst (Saleem, Malik, & Qureshi, 2021). Fourth, if two strategies are not complementary, even a self-help strategy may not be helpful. Although self-help is a determinant strategy, individual attitudes and actions still play a crucial role in the utility sectors' stress coping dynamics. Perhaps, this is what so-called God helps who help themselves!

5.3 Analysis of Strategies Selection

According to the findings, social-assistance, group-intervention, and avoidance strategies were less commonly used, and the self-help strategy was more commonly used (Simionescu, Bordea, & Pellegrini, 2022). However, as no further qualitative data was collected here, a *post-hoc* inferential analysis was adopted to explain these frequency variances; the limitations of this analytic technique are recognized and discussed later). We assume that the frequency variances are attributed to the influences of personal values in utility sectors: self-recognition, interrelationship valence, and destiny. Details follow:

Self-Recognition in the workplace: Due to the probable effects of self-recognition, the social-assistance strategy is used less often in utility sectors (e.g., how people see themselves at work, how confident they feel at work) (Shepardson, Tapio, & Funderburk, 2017). Yang and Kuo (1991) asserted that, on many social occasions, people's self-recognition (SR) stands for their competence and influence. The higher a person's self-recognition (SR), the greater their strength and proficiency. Simply put, if employees feel stressed and seek others for help, they need to tune down their SR in order to gain assistance from others. In order to be helped, employees must admit that their ability (stress coping) is insufficient, and turning down SR for assistance may be an unpleasant thing to general employees.

Interrelationship Valence: A second rationale to explain why the social-assistance strategy is less frequently used may be the possible influence of interrelationship valence (IV), which can be explained as an extension of the reciprocal social relationship. If people accept assistance from others and do not return it immediately, they owe an IV. The givers (those who provide assistance) usually do not claim

back the IV from the receiver (who accepts assistance) until they feel worthy of taking it back. IV may be invisible, but its influence affects people's social behavior. IV can sometimes be exchanged for materials (e.g., task assistance, shift-rota exchange, or absence cover-up). Social assistance from others may equate to owing an IV because once people have received assistance from others, they simultaneously owe an IV, which they will have to pay back at some point. This situation may explain why employees prefer not to use a social-assistance strategy when faced with a workplace stressor.

Destiny beliefs: The avoidance strategy is less frequently used because of the possible impact of destiny beliefs. Generally speaking, some workers may feel that destiny impacts or manipulates their lives. According to empirical studies, some employees honestly feel that sources of stress are unavoidable and cannot be removed (Chang & Lu, 2007; Saleem, Malik, & Qureshi, 2021; Shacham, Hamama-Raz, Kolerman, Mijiritsky, Ben-Ezra, & Mijiritsky, 2020). Workers feel that incentives, or positive reinforcement, are uncontrollable and unrelated to their activities (Yang & Kuo, 1991). On the other hand, adopting an avoidance strategy is only a temporary solution; sooner or later, the sources of pressure will return. Such a destiny belief may help to explain why the avoidance strategy is less frequently adopted in utility sectors.

Group-intervention strategy is less frequently adopted for three reasons besides personal values at work. Cooper (1996) suggested that using a group-intervention strategy can help clarify how stressors occur, how to avoid them, and how to manage stress. Such a strategy seems ideal and has excellent efficacy in coping with stress. However, such a strategy is rarely applicable in smaller-sized organizations as its execution generally requires two elements; firstly, it requires adequate financial sponsorship from the organization; and secondly, it requires the availability of professional staff, such as group therapists or counselors. The depressed global economy magnifies both elements (e.g., the subprime mortgage crisis in 2007-08 and unstable crude oil prices in 2008-09), and as corporate profits decline, employers often become reluctant to invest extra in providing such help.

Furthermore, in many institutions, an authoritarian culture rather than a democratic one still prevails

(Hsieh, 2004; Tyson *et al.*, 2002; Saleem, Malik, & Qureshi, 2021; Shoaib, Nawal, Korsakienė, Zámečník, Rehman, & Raišienė, 2022). Hierarchical characteristics diffuse throughout all the ranks of the organization. For this reason, if a superior participates in a group-intervention program, the subordinates may avoid direct interactions with the superior and therefore lose a chance to benefit from the program because the subordinates may feel uncomfortable if they are aware that a group member has a higher rank than themselves.

Congruent with research expectations, the most frequently adopted strategy is the self-help strategy in utility sectors. Reasons for this phenomenon are outlined here. A self-help strategy is self-contained and does not require the involvement of others. Second, such an approach is inexpensive and easy to implement, and consumers can start and stop it anytime. Thirdly, its efficacy is usually instant and foreseeable (e.g., people usually feel more relaxed and comfortable after holidays).

In addition, we highlight the importance of demographics on stress intervention in utility sectors. This study specifically discovered that educational attainment affected the relationship between self-help and stress, implying that greater educational levels boosted the efficiency of the self-help strategy in reducing stress. The efficacy of avoidance and belief-change strategies was similarly affected by gender. Males might be less anxious if they used the avoidance strategy (compared to their female counterparts). Male users of the belief-change strategy also report feeling relatively less anxious. These findings have important implications for managers and personnel practitioners in the PUS; details follow.

5.4 Limitation of the Research

This research regarded coping strategies as antecedents of stress. Data collected from such an approach should be cautiously interpreted since the coping strategies employed could have led to other effects not being measured. The long-term effects of coping strategies were not measured in this study, although coping strategies may have a distinct influence on short- and long-term adaptation (Ingledeu, Hardy & Cooper, 1997). It can be suggested that future studies should conduct a more integrated and longitudinal investigation, so a fuller scope of strategy effect can be unveiled.

Another source of caution is the nature of self-assessed data, which primarily relies on people's subjective experiences. Such information may represent a person's perception of reality rather than the true state of affairs (Podsakoff & Organ 1986; Podsakoff, MacKenzie, Lee & Podsakoff 2003). This study used self-reported measures to quantify stress, which correctly describe personal sensations but may separate stress from its greater context. This finding has ramifications for further data interpretation since the discrepancies identified may have alternative reasons. Moreover, the manager could be the source of stress at work. Future studies need to explore the manager's or supervisor's perception of stress at the individual, group, and organizational levels. Meyerson (1994) suggested that various vocations may have different cognitive and symbolic systems and that the meaning of stress may be socially manufactured. There may be industry-wide practices for reporting or asserting stress. Podsakoff and Organ (1986) proposed that investigators gather various measurements of conceptually essential variables from various sources using multiple methodologies to counteract methodological biases. A structural equation modeling technique can help examine the relationships among variables. Future research may examine using subjective and objective job stressor assessments to have a deeper understanding of these factors and their relationships.

Another concern revolves around the *post-hoc* inferential analysis. The findings extracted from the inferential analysis are primarily descriptive and exploratory, which should be interpreted with caution because the inference process may compromise ecological validity. Finally, various social structures and historical circumstances may have different values, social norms, and ethics, so a stressor may be widely prevalent in one workplace but seldom prominent in another. Future studies should compare different values across public and private sectors to better understand the impact of values on strategy development and implementation.

6. Conclusions

People with a passive attitude or who use aversive strategies to handle the pressure are more likely to develop physical or mental signs of stress when it comes to stress coping. Stressors do not dissipate

independently, and self-neglect and avoidance methods only accumulate pressure. Effective coping strategies can assist the PUS handle stressful situations and lessen negative feelings. However, improper selection of coping strategies results in extreme stress or even suicide (Thai, Le, Huynh, Pham, & Bui, 2021). Therefore, having a proactive mindset and constructive stress management practices, on the other hand, will successfully cushion stressors, reducing the negative impact of stressors.

In this study, we analyzed the efficacy of common job-stress coping strategies among employees from four utility sectors in Taiwan during the COVID-19 pandemic. We found that the efficacy of strategies is not universal but depends on gender, educational level, and the interaction of adopted strategies. We also found that some dual strategies are more effective than others at reducing stress, with *group-intervention* plus *self-help strategies* the most effective. This study also argued that some personal values at work (e.g., destiny beliefs) might have a subtle impact on stress induction or even formation (Chang & Lu, 2007; Keech & Hamilton, 2021; Shacham, Hamama-Raz, Kolerman, Mijiritsky, Ben-Ezra, & Mijiritsky, 2020). Personnel managers in the utility sectors are advised to survey their employees on these personal values and develop appropriate interventions accordingly. When these stress-provoking values are well handled, the coping strategies reach their maximum efficacy.

If applicable, leaders and managers of utility sectors should take a more active role in tackling stress at work. A stress awareness program, for instance, may be implemented to track the emergence and progression of stressors. Once a latent stressor has been identified, appropriate treatments can be implemented to reduce stress's detrimental effects. Workshops regularly may also aid in probing the dynamics of stress development. It should be suggested that utility sectors conduct training programs to enhance the efficacy of common job-stress coping strategies.

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Table 1: Occupational Stress Coping Scale†

Prelude: Which of the following strategies do you adopt to cope with job stress?

Social-assistance strategy (*sub* $\alpha = .86$)

Item 1: Talk to psychiatrists, consultants, or other professionals.?

Item 2: Discuss problems with partners and family members.

Item 3: Ask assistance from friends.

Self-help strategy (*sub* $\alpha = .85$)

Item 4: Read stress intervention books.

Item 5: Sport and other outdoor activities.

Item 6: Meditation.

Group-intervention strategy (*sub* $\alpha = .78$)

Item 7: Attend stress reduction programs at work.

Item 8: Join the stress intervention workshop.

Item 9: Discuss problems in the routine meetings.

Avoidance strategy (*sub* $\alpha = .77$)

Item 10: Leave the stressful conditions or worksites.

Item 11: Ignore the feeling of pressure.

Item 12: Forget the existence of stressors at work.

Belief-change strategy (*sub* $\alpha = .78$)

Item 13: Thinking optimistically.

Item 14: Other employees may have worse conditions.

Item 15: Sooner or later, I can fix the problems.

† . Occupational Stress Coping Scale (Scale $\alpha = .76$; Chang & Hargreaves, 2006).

Table 2: Multiple Correlation Analysis and Statistics

(Scales)	μ (σ)	<i>Correlation Coefficients (r)</i>				
		1	2	3	4	5
1. Social-assistance strategy	1.98 (.58)					
2. Self-help strategy	3.34 (.71)	.26**				
3. Group-intervention strategy	2.02 (.97)	.27**	.28**			
4. Avoidance strategy	2.14 (.71)	-.02	.06	-.17**		
5. Belief-change strategy	2.52 (.60)	.02	.06	.08	.10	
6. Occupational stress	2.66 (.52)	-.11	-.28**	-.17**	.17**	-.13*

*. $p < .05$; **. $p < .01$

Table 3: Hierarchical moderated regression analysis

Step	β †	<i>t</i>	R ²	ΔR^2	Total R
Demographic variables (Model 1)			.034	.026	.183
Gender	.10	2.52**			
Educational levels	-.09	-2.49**			
Job Tenure	-.14	-2.28*			
Age	.02	.34			
Coping strategies (Model 2)			.117	.103	.341
Avoidance strategy	.22	5.75***			
Self-help strategy	-.14	-3.83***			
Belief-change strategy	-.09	-2.34*			
Group-intervention strategy	-.05	-1.43			
Social-assistance strategy	-.04	-1.10			

†. The β values are the standardized coefficients from the final simultaneous analyses, each term being corrected for all other terms in the model. The value of the constant in the equation is 33.54; *Model 1*: $F(5, 655) = 4.55, p < .001$; *Model 2*: $F(10, 650) = 8.58, p < .001$. (* $p < .05$; ** $p < .01$; *** $p < .001$)

Table 4: Efficacy of dual coping strategies

Coping strategies	β	t	R^2	ΔR^2	F/p
Social-assistance strategy / Group-intervention strategy	.39	2.22*			
Self-help strategy / Group-intervention strategy	-.35	-2.52**			
Self-help strategy / Avoidance strategy	.31	2.27*			
			.098	.084	7.07‡

‡. $F(10, 650) = 7.07, p < .001$; Constant = 29.60; Condition Index = 6.21 (* $p < .05$; ** $p < .01$).

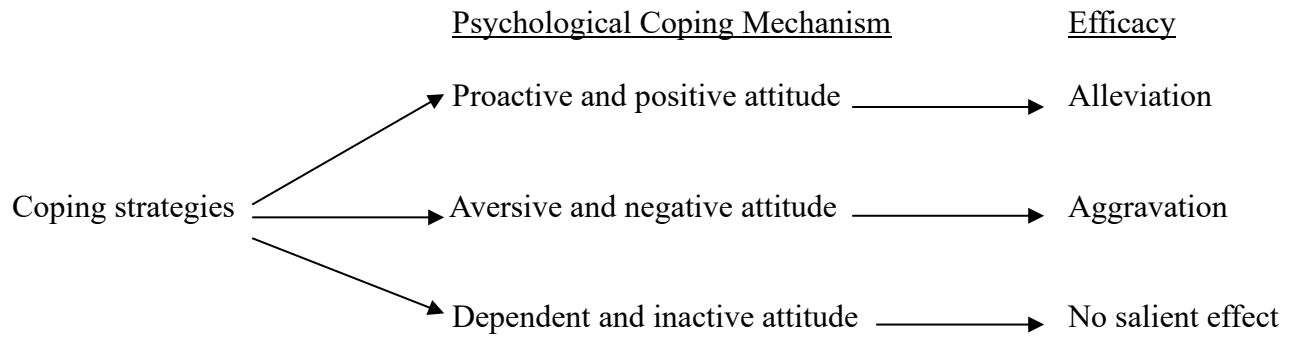


Figure 1: Research Framework