Effect of psychosocial safety climate on work-family conflict and psychological health among working couples

Nurfazreen Aina Muhamad Nasharudin[1,*] 🆔, Zhao Rui[2] 🆔

[1]Department Professional Development and Continuing Education, Faculty of Educational Studies, Universiti Putra Malaysia, Seri Kembangan, Malaysia
[2]Institute for Social Science Studies, Universiti Putra Malaysia, Seri Kembangan, Malaysia

Corresponding author:
Nurfazreen Aina Muhamad Nasharudin
Department Professional Development
and Continuing Education, Faculty of
Educational Studies, Universiti Putra
Malaysia, 43400 Seri Kembangan,
Malaysia
E-mail: fazreenasha2@gmail.com

ABSTRACT

Background: The purpose of the study was to look into how work-family conflict (WFC), family-work conflict (FWC), and psychological health are affected by the psychosocial safety climate (PSC). First, the study suggested that for both husband and wife, PSC moderates the relationship between job demands and WFC. Second, the study predicted FWC mediates the relationship between WFC and depressive symptoms through the "crossover" process.

Methods: The study design used a multi-source sample that involved 350 teachers and their working spouses (n = 700). The analysis of mediation and moderation among job demands, WFC, FWC, PSC, and depressive symptoms was conducted using SPSS and structural equation modeling AMOS software.

Results: For the teacher's sample, based on behavioral ($\beta = 0.166$, $p < 0.05$) and strain-based ($\beta = 0.170$, $p < 0.05$) aspects, the hierarchical regression analysis revealed that the PSC moderates the relationship between physical demand and WFC. The results also showed that the relationship between time-based WFC and emotional demand is moderated by PSC ($\beta = 0.103$, $p < 0.05$). Next, the analysis found that PSC moderates the association between cognitive demand and WFC of strain-based ($\beta = 0.179$, $p < 0.05$). For the spouse's sample, according to the analysis, PSC moderates the relationship between strain-based WFC and physical demand ($\beta = 0.091$, $p < 0.05$). The study also revealed that FWC serves as a mediator in the relationship between WFC and depressive symptoms in both husbands ($\beta = 0.233$, $p < 0.01$) and wives ($\beta = 0.135$, $p < 0.001$).

Conclusions: Overall, this study contributes significant insights to the current literature by examining the impact of PSC on the psychological well-being of individuals and others through the crossover process.

Keywords: Psychosocial safety climate; Occupational stress; Work-life balance; Depressive

BACKGROUND

Research within the Job Demand-Resources (JD-R) theory framework has predominantly focused on establishing connections between workplace characteristics and employees' psychological health and well-being.[1]

Work-related factors, signifying pathways to health impairment, demonstrate how job demands influence strain and adversely affect psychological health.[2] Building upon this perspective, we posit that psychosocial safety climate (PSC) could alter the pathways through which work demands affect psychological health, reversing the direction of erosion. PSC represents a scenario where the organization implements policies, practices, and procedures aimed at safeguarding the mental health and behavioral practices of its employees.[3] While, job demands are defined as "those organizational, social, or physical aspects of the job that are associated with certain physiological and psychological costs because they require sustained physical or mental effort.[4] Thereby, the purpose of this suggested framework is to investigate the relationship between work-family conflict (WFC) and depression symptoms in married individuals who are employed by integrating PSC into the JD-R model.

Numerous studies have shown that PSC precedes job characteristics such as job demands, and these factors impact the health and work performance of employees.[5-7] Moreover, numerous investigations have endeavored to examine the moderating function of PSC in the relationship between job demands and mental well-being.[8,9] For example, a study by Zadow et al.[10] discovered that low workplace PSC raised Australian workers' chance of experiencing depressive symptoms. To date, previous research has demonstrated that PSC serves as a macro-level resource and a protective signal for employees, functioning to mitigate the psychological health impacts induced by job demands.

Nevertheless, many earlier studies related to PSC have investigated how job demands impact personal psychological health, but they have not explored the effects on the relationship between work and family (specifically the work-family conflict). When an individual struggles to balance competing responsibilities, such as job and family, it can lead to WFC.[11] Therefore, while previous studies have focused on PSC's impact on individual psychological health, our current study explores its effect on work and family roles in both working husbands and wives. Therefore, this study suggests:

H1: PSC negatively moderates the relationship between job demands and the WFC of teachers.

H2: PSC negatively moderates the relationship between job demands and the WFC of spouse.

Nowadays, WFC has become widespread, particularly among couples where both the husband and wife are employed. WFC is a situation of inter-role conflict when this negative experience spillover from work to the family domain.[12,13] As individuals allocate more hours to work, they find themselves with less time to dedicate to family matters. Moreover, individuals must exert additional energy to meet the demands of their work, which results in energy exhaustion while with the family at home. Similarly, family-work conflict (FWC) is characterized as a form of inter-role conflict, where adverse family-related experiences impact the work environment, as defined by Miller et al.[14] For instance, an individual who needs to fulfill a lot of family responsibilities must feel exhausted to concentrate on work when at the workplace. Hence, when work and family responsibilities are not in harmony with one another, circumstances such as WFC and FWC exacerbate the tension between them.

Recent research has discovered that working spouses frequently encounter role conflicts between their work obligations and family responsibilities.[15,16] A study by Matei and Virga[17] discovered that a wife's WFC leads to a husband's negative psychological health behavior through her husband's WFC. This study showed that husband must took over wife's household responsibilities when wife was unable to manage commitment between work (at the workplace) and family (at home). Hence, husband's WFC rises as a result of this circumstance, which also affects his psychological health. Another study by Wan et al.[18] indicated that job and family stressor increase WFC and FWC among working couples. The conflict roles may affect each other's responsibilities which results in experiencing stress and other's psychological health problem. According to Actor-Partner Interdependence Model, spouses complement each other to support their household roles.[19] As working partners play a crucial role at work, he/she must be exhausted to involve in the family domain. On the other way around, the spouse must give more attention to household responsibilities that lead to his/her own FWC, which in turn triggers the level of depressive symptoms.

Moreover, recent research predominantly examines the influence of PSC on employees' personal psychological health,[20,21] such as its impact within the workplace. Therefore, this study aims to address a gap in the literature by exploring how the "crossover" mechanism indirectly affects the psychological health of spouses through the influence of PSC. Drawing on the foundational premise of the crossover theory and utilizing the actor-partner interdependence model,[22] individuals are analyzed within dyadic relationships, which constitute the primary unit of analysis. In the present study, PSC was integrated within both the JD-R and crossover models. PSC precedes WFC, thereby one person's independent variable (e.g., work-family conflict) has the potential to influence both their own and their partner's dependent variable (e.g., depressive symptoms level).

Therefore, we are interested to examine an individual's WFC cross-over to a spouse's depressive symptoms through a spouse's FWC (Fig. 1). Thus, we predict that:

H3: Teacher's WFC leads to the spouse's depressive symptoms through the mediation of the spouse's FWC.

H4: Spouse's WFC leads to the teacher's depressive symptoms through the mediation of the teacher's FWC.

METHODS

Participants and procedure

Data collection took place between March and October 2023, involving the recruitment of 350 working spouses from 15 secondary schools situated in Malaysia. Following discussions with the Ministry of Education (MOE), 15 schools were identified to represent each state in Malaysia, with the exception of Labuan. The MOE conducted the selection process, utilizing both stratified and simple random sampling methods. These schools were chosen specifically because they have the highest number of married female teachers with children. All samples were female teachers and their spouses (n = 700). Spouse occupations were manager, engineer, public servant, police officer, and others. The criteria for selected participants were based on gender and marital status. About 20–25 women and married teachers (and working spouses) were randomly selected from each school.

According to Agyapong et al.,[23] two-thirds of teach-ers globally experience stress at work for at least half of their working hours. This investigation identified teacher workload as a prevalent source of stress, which often results in conflict. Conversely, Ozamiz-Etxebarria et al.[24] found that Asian teachers report higher levels of stress and anxiety compared to educators in other regions. The National Union of the Teaching Profession Malaysia[25] reported that nearly 70% of teachers in Malaysia experience stress attributable to their workload. Despite women holding professional roles, the collectivist culture in Asia persists, emphasizing traditional gender roles where women are primarily responsible for home and childcare, a trend evident even in Malaysia.[26] Consequently, balancing work and family duties results in work-family conflict, potentially disrupting the family and professional roles of partners as well. Given that over 70% of secondary school teachers are female,[27] female teachers and their spouses were chosen as the focal participants for this study.

Among the 350 female respondents, all (100%) were employed as teachers. The majority of them (75.2%) fell within the age range of 31 to 40 years, and 72.9% held a first-degree education. Most of them were Muslim and Malays (n = 304, 86.9%). For male (spouse) respondents, most (n = 289, 82.6%) worked in the private sector; 266 (76.0%) were aged between 41-50 years old; 311 (88.9%) had a first-degree education; and the majority were Muslim and Malays (n = 304, 86.9%). In this study, first-degree education refers to the undergraduate study or bachelor's degree (Table 1).

Survey instrument

Job demands assessed using 16 items from the demand-induced strain compensation (DISC) 2.1 instrument by De Jonge et al.[28] were categorized into three sub-dimensions: cognitive demands (five items) and emotional demands (six items), and physical demands (five items). The reliability value for women samples was 0.89, while for men (spouse) samples, it was 0.87.

Depressive symptoms were measured using the Occupational Depression Inventory (ODI) instrument, which consisted of nine items.[29] The item scales spanned from "1" (never/almost never) to "4" (nearly every day). The men's and women's samples had reliability scores of 0.90 and 0.88, respectively.
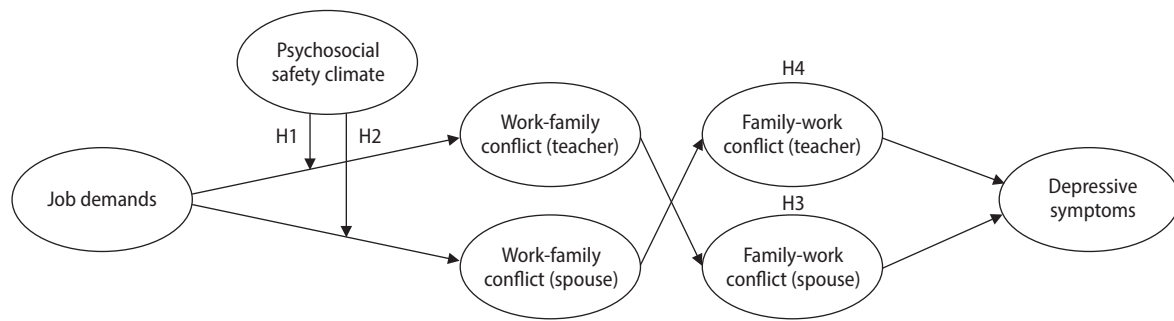
Fig. 1. The model of study (H1–H4 = Hypothesis 1–4).

Table 1. Demographic data of the study

	Female	Male
Occupation		
Teacher	350 (100)	61 (17.4)
Others	0 (0)	289 (82.6)
Age (years)		
21–30	32 (9.1)	29 (8.3)
31–40	263 (75.2)	38 (10.9)
41–50	46 (13.2)	266 (76.0)
51–60	9 (2.6)	17 (4.9)
Education		
First-degree	255 (72.9)	311 (88.9)
Master degree	93 (26.6)	39 (11.1)
Doctor of philosophy (PhD)	2 (0.6)	0 (0)
Ethnic/Religion		
Malay/Muslim	304 (86.9)	304 (86.9)
Chinese/Buddha	36 (10.3)	36 (10.3)
Indian/Hindu	10 (2.9)	10 (2.9)

Values are presented as number (%).
First-degree education is referred to the bachelor degree or undergraduate study.

WFC and FWC were measured by the work-family conflict scale (WFCS) with 18 items.[30] Three sub-dimensions of WFC were measured: time-based work interference with family (3 items), work interference with family comprised two aspects (strain-based [3 items] and behavior-based [3 items]). While, three sub-dimensions of FWC were measured: family interference with work included three dimensions (time-based [3 items], strain-based [3 items], and behavior-based [3 items]). Time-based conflict arises when time allocated to one role cannot be fully dedicated to another role. Strain-based conflict occurs when strain experienced in one role impacts performance in another. Behavior-based conflict refers to specific patterns of in-role behavior

that may clash with expectations for behavior in another role. "1" on the scale denoted strongly disagreement, and "5" denoted strongly agreement. In terms of WFC dependability, the values for male and female samples were 0.82 and 0.89, respectively. For samples of women, the FWC reliability rating was 0.84, while for samples of men, it was 0.83.

PSC was assessed using nine items from the PSC-12 instrument, which was developed by Hall et al.[31] From "1" (strongly disagree) to "5" (strongly agree), the item scales varied. For the samples of men and women, the reliability values were 0.8 and 0.87, respectively.

Statistical analysis

To ensure the validity of the instruments employed, we initiated confirmatory factor analysis (CFA) tests (Table 2). We used five fit indices, including the chi-square statistic (χ^2), the goodness-of-fit index (GFI), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error of approximation (RMSEA). Following the guidelines of Hooper et al.,[32] GFI, CFI, and TLI values should exceed 0.90, while the RMSEA value should be 0.09 or lower.

Second, using the AMOS program, we used structural equation modeling to examine the mediation process. To evaluate our hypotheses, following MacKinnon's[33] recommendations, we conducted the mediation process. According to the mediation model, FWC (X→M→Y/Paths a & b) and WFC (X→Y/Path c) both directly and indirectly predict depressed symptoms. Remember that partial mediation is indicated if there is considerable mediation and the c' coefficient is still statistically significant.[34] On the other hand, full mediation is supported if there is significant mediation and the c' coefficient no

Table 2. Confirmatory factor analysis test for measurement models

Model	χ^2	df	GFI	CFI	TLI	RMSEA	AIC	CMIN/df
Teacher's sample (women)								
1. Three-factor model (CD, ED, PD)	259.618	85	0.904	0.939	0.925	0.082	329.618	3.054
2. Six-factor model (WFCT, WFCS, WFCB, FWCT, FWCS, FWCB)	256.568	104	0.912	0.966	0.956	0.070	354.568	2.467
3. Four-factor model (PSC, CD, ED, PD)	473.505	238	0.901	0.957	0.950	0.057	597.505	1.990
4. Five-factor model (JD, DEP, WFC, FWC, PSC)	1331.487	731	0.915	0.918	0.908	0.059	1,521.487	1.821
Spouse's sample (men)								
1. Three-factor model (CD, ED, PD)	250.756	80	0.902	0.940	0.910	0.070	235.756	3.134
2. Six-factor model (WFCT, WFCS, WFCB, FWCT, FWCS, FWCB)	250.445	103	0.921	0.956	0.912	0.067	341.445	2.431
3. Four-factor model (PSC, CD, ED, PD)	380.407	210	0.902	0.950	0.930	0.058	340.407	1.811
4. Five-factor model (JD, DEP, WFC, FWC, PSC)	1,251.348	703	0.910	0.908	0.910	0.058	1551.348	1.780

χ^2: chi-square; df: degrees of freedom; GFI: goodness-of-fit index; CFI: comparative fit index; TLI: Tucker-Lewis index; RMSEA: root-mean-square error of approximation; AIC: Akaike information criterion; CMIN/df: chi-square divided by the df value; CD: cognitive demand; ED: emotional demand; PD: physical demand; WFCT: work-family conflict time; WFCS: work–family conflict scale; WFCB: work-family conflict behaviour; FWCT: family-work conflict time; FWCS: family-work conflict strain; FWCB: family-work conflict behaviour; PSC: psychosocial safety climate; JD: job demands; DEP: depressive symptoms; WFC: work-family conflict; FWC: family-work conflict.

Table 3. Test for mediation using a bootstrap analysis with 90% confidence interval

Hypothesis/Relationship	Direct effect (X→Y)	Indirect effect (X→M→Y)	Result
Women (teachers)			
WFC (time) → FWC spouse (time) → Depressive symptoms spouse	0.085 (ns)	0.004 (ns)	No mediation
WFC (strain) → FWC spouse (strain) → Depressive symptoms spouse	0.054 (ns)	0.135***	Full mediation
WFC (behaviour) → FWC spouse (behaviour) → Depressive symptoms spouse	0.035 (ns)	0.015 (ns)	No mediation
Men (spouses)			
WFC (time) → FWC teacher (time) → Depressive symptoms teacher	0.095 (ns)	0.233**	Full mediation
WFC (strain) → FWC teacher (strain) → Depressive symptoms teacher	0.073 (ns)	0.025 (ns)	No mediation
WFC (behaviour) → FWC teacher (behaviour) → Depressive symptoms teacher	0.210*	0.108**	Partial mediation

Unstandardized coefficients reported. Values in parentheses are estimate value. Bootstrap sample equal to 1,000 with replacement. n = 350.
WFC: work-family conflict; FWC: family-work conflict.
*p < 0.05, **p < 0.01; ns: not significant.

longer has significance.[34] The results as shown in Table 3.

Third, we employed SPSS version 25 (IBM Corp., Armonk, NY, USA) for analyzing the interaction effect. Hierarchical regression analysis results are presented in Table 4. To examine the interaction effect of PSC (as shown in Table 4), we included the product term between job demands and PSC in our direct effect model of WFC and job demands (following Step 2). In our regression analysis of the direct effect model for time-based conflict (following Step 2), we incorporated the interaction product term between cognitive demands and PSC. To explore the impact on strain-based and behavior-based conflict, we followed a similar testing process as previously described, replacing cognitive demands with emotional and physical demands. Follow-ing Dawson's guidance,[35] we plotted moderating effects and interaction patterns using simple slope tests (Figs. 2–5, Supplementary Fig. 1). Our approach adhered to Cohen et al.'s proposal[36] by standardized beta value.

Ethics statement

This study was exempt from the ethical approval by the Institutional Review Board of Universiti Putra Malaysia. The IRB approval number is JKEUPM-2021-330. Every method used in research projects involving human subjects complied with the ethical norms established by national and/or institutional research committees, the 1964 Helsinki Declaration and its updates, or comparable ethical guidelines. Every single participant who took part in the study gave us their informed consent.

Table 4. Results of regression and interaction analysis between job demands, PSC and work-family conflict

Variable	Women			Men		
	β Step 1	β Step 2	β Step 3	β Step 1	β Step 2	β Step 3
Work-family conflict (time-based)						
Control						
Age	−0.021	−0.006	−0.008	−0.042	−0.030	−0.030
Sex	0.001	0.001	0.033	0.056	0.064	0.066
Education	0.065*	0.129*	0.015	0.082	0.119*	0.118*
Main effect						
Cognitive demands	-	0.034	0.025	-	0.182*	0.076
Emotional demands	-	0.301**	0.295**	-	0.205*	0.050
Physical demands	-	0.289***	0.064	-	0.262***	0.043
PSC	-	0.343***	-0.310*	-	0.018	0.091
Interaction effect						
Cognitive demands × PSC	-	-	0.010	-	-	0.080
Emotional demands × PSC	-	-	0.103*	-	-	0.087
Physical demands × PSC	-	-	0.083	-	-	0.069
R^2	0.132	0.205	0.309	0.011	0.243	0.249
ΔR^2	0.104*	0.346***	0.366***	0.001	0.225***	0.233***
Work-family conflict (strain-based)						
Control						
Age	0.015	0.049	0.059	0.078	-0.065	-0.065
Sex	0.109*	0.074	0.086	0.070	0.044	0.049
Education	0.040	0.033	0.003	0.009	0.033	0.030
Main effect						
Cognitive demands	-	0.130*	0.119*	-	0.174*	0.037
Emotional demands	-	0.167*	0.142*	-	0.106*	0.017
Physical demands	-	0.236***	0.109	-	0.231*	0.229*
PSC	-	−0.315***	-0.282***	-	−0.358***	−0.268**
Interaction effect						
Cognitive demands × PSC	-	-	0.179*	-	-	0.062
Emotional demands × PSC	-	-	0.089	-	-	0.081
Physical demands × PSC	-	-	0.166*	-	-	0.091*
R^2	0.156	0.304	0.345	0.009	0.273	0.284
ΔR^2	0.203*	0.290***	0.325***	0.001	0.256***	0.259***
Work-family conflict (behaviour-based)						
Control						
Age	0.013	0.027	0.024	−0.022	−0.002	−0.004
Sex	0.003	0.001	0.010	−0.126*	−0.036	−0.039
Education	0.060	0.105	0.140	0.084	0.094	0.094
Main effect						
Cognitive demands	-	0.133*	0.184*	-	0.101	0.108
Emotional demands	-	0.444***	0.139	-	0.271***	0.156*
Physical demands	-	0.124*	0.295**	-	0.171*	0.049
PSC	-	−0.457***	−0.406***	-	−0.088	−0.091
Interaction effect						
Cognitive demands × PSC	-	-	0.142	-	-	0.087
Emotional demands × PSC	-	-	0.022	-	-	0.099
Physical demands × PSC	-	-	0.170*	-	-	0.068
R^2	0.103	0.297	0.321	0.014	0.220	0.229
ΔR^2	0.190	0.280	0.289	0.004	0.202***	0.203***

Age (years): 1 = 21–30, 2 = 31–40, 3 = 41–50, 4 = 51–60, 5 = >60; Sex: 1 = Male, 2 = Female; β = unstandardized regression coefficient; n = 350.
PSC: psychosocial safety climate.
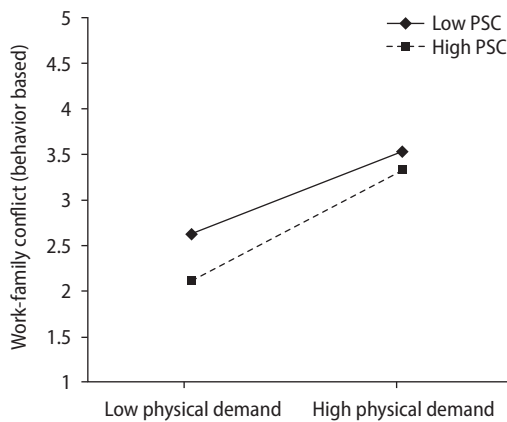*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Fig. 2. Interaction effect of physical demand and psychosocial safety climate (PSC) on work-family conflict (behavior-based).
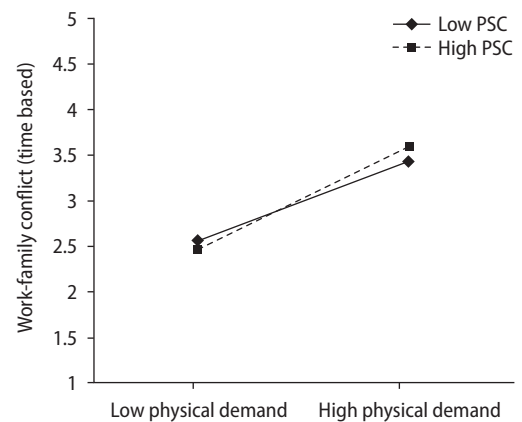

Fig. 3. Interaction effect of emotional demand and psychosocial safety climate (PSC) on work-family conflict (time-based).
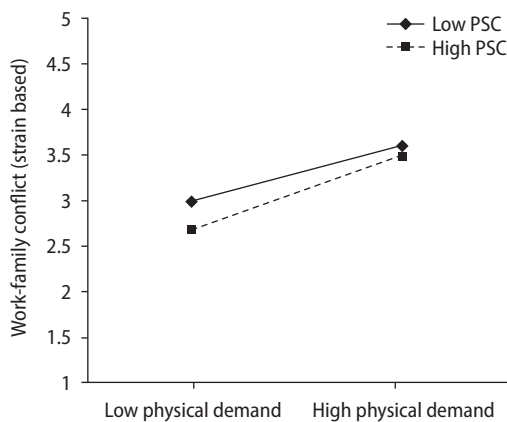

Fig. 4. Interaction effect of cognitive demand and psychosocial safety climate (PSC) on work-family conflict (strain-based).
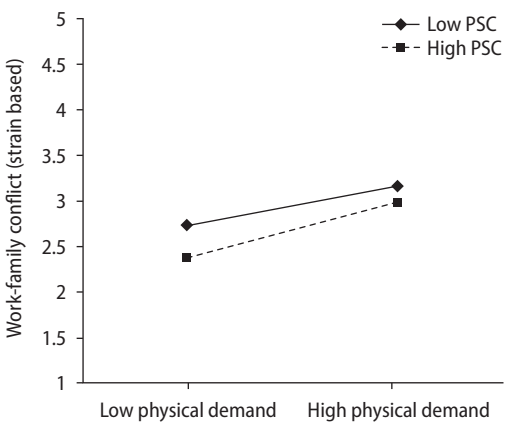

Fig. 5. Interaction effect of physical demand and psychosocial safety climate (PSC) on work-family conflict (strain-based).

RESULTS

Confirmatory factor analysis
We conducted CFA to assess the empirical distinctiveness of the study variables. For both the women's and spouse's samples, the three-factor, six-factor, four-factor, and five-factor models exhibited a good-fit indices, as shown in Table 2. Based on the CFA results for both women and men samples (Table 2), the five-factor model demonstrated the best fit. Specifically, for women, the goodness-of-fit indices were as follows: GFI = 0.915, CFI = 0.918, TLI = 0.908, RMSEA = 0.059, and chi-square divided by the *df* value (CMIN/*df*) = 1.821. For men, the corresponding indices were GFI = 0.910, CFI = 0.908, TLI = 0.910, RMSEA = 0.058, and CMIN/*df* =

1.780. These findings support the distinctiveness of all measurements. Additionally, the path diagrams of the model are given (Supplementary Figs. 2–5).

Main effects
The first hypothesis (H1) proposed that PSC would be shown to have a moderating influence on the relationship between WFC and job demands among women teachers. The results of the study showed that PSC moderates the relationship between job demands and WFC. However, several results indicated that PSC did not moderate the association between job demands and WFC. The details of results are mentioned in Table 4. Thus, H1 was partially supported.

For men samples (spouse), in line with hypothesis

two (H2), we postulated that PSC would mitigate the relationship between WFC and job demands on the spouse. In contrast to women samples, we only found one interaction effect for men samples (Table 4). Therefore, H2 was not fully supported.

For women samples (teacher), in hypothesis three (H3), the prediction was that men's FWC would act as a mediator in the relationship between women's WFC and men's depressive symptoms. Based on the results in Table 3, since the direct relationship between men's depressed symptoms and women's WFC was shown to be non-significant, the direct mediation effect would be apparent. Thus, the full mediation occurred for men's FWC that related to strain. But the analysis showed that no mediation effect was found for both time's WFC and behavior's WFC of women to men's depressive symptoms. Hence, H3 was partially supported.

For men samples (spouse), as per hypothesis four (H4), our expectation was that women's FWC would mediate the relationship between men's WFC and women's depressive symptoms. As reported in Table 3, the direct relationship between men's WFC and women's depressive symptoms became statistically insignificant when women's FWC was taken into account as a mediator. Hence, for women's time-based FWC, comprehensive mediation was noted. Similarly, the study showed that the relationship between men's WFC and women's depressive symptoms was mediated by women's behavior-based FWC. However, even with women's FWC included as a mediator, there is still a significant direct link between men's WFC and women's depressed symptoms. Therefore, partial mediation occurred for women's FWC that related to behavior. Overall, H4 was partially supported.

According to the interaction pattern illustrated, PSC mitigated the negative relationship between high physical demands and behavior-based WFC (Fig. 2) and strain-based WFC (Fig. 5) among female teachers compared to those experiencing low physical demands. Additionally, high PSC alleviates the impact of high cognitive demands on strain-based WFC more effectively than low PSC (Fig. 4). This indicates that PSC is effective in reducing the impact of experiencing physical demand and cognitive demands on teachers. Our research revealed that high emotional demand combined with high PSC increases time-based WFC compared to low PSC (Fig. 3). This suggests that PSC cannot mitigate the effects of high emotional demand on time-based WFC among women.

For the spouse sample, the findings indicate that PSC does not influence the relationship between physical demand and strain-based WFC, as both high and low PSC converge at the same point (Supplementary Fig. 1). This may be because PSC lacks sufficient physical support elements to weaken the impact of physical demand.

DISCUSSION

Prior research has indicated that social support, workplace resources, and job crafting can all mitigate the relationship between job stressors and psychological health issues experienced by individuals who work,[37,38] in contract, our current study found that for both working spouses, PSC reduced the relationship between WFC and job demands. The reason behind this has shown that the cognitive demands and physical activity at school would not help women teachers to be more productive at home. However, the existence of PSC such as strong concern from school management about teacher's health help to reduce the experience of cognitive and physical demand and WFC. For example, a school that provides PSC medium such as sharing opinions about work and practice making suggestions to overcome challenges may reduce the impact of cognitive and physical demand at work, which in turn, avoid teachers experiencing conflict role between work and family. Thus, it would benefit to improve teachers' productive behavior at home.

Interestingly, our study revealed that high emotional demand and high PSC increase WFC time-based compared to low PSC. Therefore, our study advocate that PSC is unable to buffer the effect of high emotional demand on the WFC of time-based among women. The rationale behind these conditions suggests that individuals may feel emotionally burdened by the rules, practices, and procedures designed to protect the psychological health and safety of employees, which are necessary regulations.

Subsequently, the findings demonstrate that PSC might not affect the association between physical demand and WFC of strain-based, as high or low PSC are reaching the same point (for the spouse sample). The logic reason behind this finding is that PSC might have inadequate elements of physical support to diminish the impact of physical demand. The organization should provide specific physical support that related to the type of occupations which could reduce the experience of physical demand. However, in the current study, we could not specify further as spouse samples are from various types of occupations.

In line with the claim that prior research has established the mediation role of FWC between WFC and psychological well-being,[39,40] our study again supported this notion for WFC in related to strain. A study by Grzywacz and Smith[41] found that WFC's husbands lead to wives' psychological health through FWC's husbands. A recent study by Vahedi et al.[42] showed that WFC can lead to a spouse's parenting irritability through the spouse's perception. Interestingly, our study found that WFC teachers influence the spouse's depressive symptoms through the experience of the spouse's FWC concerning strain. While, WFC (time-based) spouse leads to the teacher's depressive symptoms through the experience of the teacher's FWC, and WFC (behaviour-based) spouse leads to the teacher's depressive symptoms via teachers that experience FWC relating to behavior-based. The logic behind these situations is when an individual is unable to manage his/her family roles, therefore, the spouse must take over the family roles. For example, teachers who felt tired to involve in family responsibilities would need their spouses to take over the responsibilities. However, at the same time, the spouse also needs to manage their own work-family roles. In other words, the spouse must execute a "double role" and due to these circumstances, the level of experiencing depressive symptoms would increase among spouses.

The current findings indicate women teachers experiencing depressive symptoms due to conflicts between their family and work roles. These scenarios could be explained due to collectivist culture in Malaysia. Although women hold professional positions, the collectivist culture in Asia persists, emphasizing traditional gender roles where women are primarily responsible for home and childcare, this trend is evident in Malaysia as well.[26] Consequently, the difficulty in balancing work and family responsibilities contributes to poor psychological health.

The results of the current study demonstrated that PSC altered the direction of the relationship between work-related demands, WFC, FWC, and the level of depressive symptom experience. When PSC diminish the effect of work demands on WFC, individuals can do their roles ideally. Meanwhile, spouse would not be physically or emotionally burdened by family-work roles. Overall, as PSC reduce the experience of WFC, indirectly it would reduce the level of spouse's depressive symptoms when they experience low FWC. PSC is not only useful to diminish WFC/FWC of individuals but spouse psychological health too.

First, the majority of earlier research looked at how PSC affected psychological health and job demands within the framework of an individual's work role.[43-45] The scope of PSC has been extended to include the job and family domains by our current study. The results of the current study demonstrate that PSC enhances family roles and helps people participate at work.

Second, while most of the PSC studies focused on the "individual", but, the current study looked at the "crossover" level. According to the current study, when PSC lessens the tension between work and family responsibilities, it has an indirect effect on a spouse's depression symptoms. This study provides crucial knowledge to the existing literature by determining the factors of PSC that indirectly lead to other's psychological health. Due to the lack of PSC study in the context of "crossover", researchers should extend this investigation in the future study to determine how far PSC could influence the well-being spouse.

This study has several limitations. Firstly, its cross-sectional design prevents the establishment of causality. Future research should adopt a longitudinal approach, incorporating several months between the first and second data collection points to enhance validity. Nevertheless, this study utilized multi-source data, including samples from both teachers (wives) and their spouses (husbands), which helps mitigate common method variance issues.[46] Secondly our study utilized samples

of teachers and their spouses (from various occupations), which allows for generalization to the population of teachers but not to their spouses. Future research should include participants from diverse occupations to broaden the findings and enable generalization to a wider working population.

From a practical standpoint, our research recommends that school management or organizations identify the specific elements of PSC that may diminish specific job demands at work. Emphasizing knowledge about these specific PSC elements (i.e., PSC elements that related to cognitive, emotional, or physical demands) can aid organizations in enhancing procedures, policies, and practices designed to protect teachers' psychological health. Furthermore, improving PSC elements while considering cultural differences may assist policymakers in developing rules and practices that are relevant to employees. PSC elements that align with work contexts and cultural factors could effectively reduce the impact of job demands and role conflicts.

CONCLUSIONS

PSC within organizations significantly influences employee well-being. Recent research demonstrates that PSC not only safeguards employees' mental health at work but also benefits their partners' health at home. By fostering PSC in the workplace, it is possible to alleviate job demands and reduce conflicts between work and family roles, which can indirectly enhance partners' well-being. Consequently, structuring the work environment, policies, and organizational procedures through PSC contributes to a healthier and more sustainable work life for employees, ultimately promoting organizational success.

NOTES

Abbreviations
CFA: confirmatory factor analysis; CFI: comparative fit index; DISC: demand-induced strain compensation; FWC: family-work conflict; GFI: goodness-of-fit index; JD-R: Job Demand-Resources; MOE: Ministry of Education; ODI: Occupational Depression Inventory; PSC: psychosocial safety climate; RMSEA: root-mean-square error of approximation; TLI: Tucker-Lewis index; WFC: work-family conflict; WFCS: work-family conflict scale.

Competing interests
The authors declare that they have no competing interests.

Author contributions
Conceptualization: Nasharudin NAM. Data curation: Nasharudin NAM. Formal analysis: Nasharudin NAM. Methodology: Nasharudin NAM. Writing - original draft: Nasharudin NAM. Writing - review & editing: Nasharudin NAM, Rui Z.

SUPPLEMENTARY MATERIAL

Supplementary Fig. 1. Interaction effect of physical demand and psychosocial safety climate (PSC) on work-family conflict (strain-based)

Supplementary Fig. 2. Three-factor model consists cognitive (Cd), emotional (Ed), and physical demands (Pd)

Supplementary Fig. 3. Six-factor model consists work-family conflict of time (WFCtime), work-family conflict of strain (WFCstrain), work-family conflict of behaviour (WFCbehaviour), family-work conflict of time (FWCtime), family-work conflict of strain (FWCstrain), and family-work conflict of behaviour (FWCbahviour)

Supplementary Fig. 4. Four-factor model consists cognitive (Cd), emotional (Ed), and physical demands (Pd), and psychosocial safety climate (PSC)

Supplementary Fig. 5. Five-factor model consists job demands (JD), depression (DEP), work-family conflict (WFC), family-work conflict (FWC), and psychosocial safety climate (PSC)

REFERENCES

1. Bakker AB, Demerouti E. Multiple levels in job demands-resources theory: implications for employee well-being and performance. In: Diener E, Oishi S, Tay L, editors. *Handbook*

of Wellbeing. Salt Lake City, UT, USA: DEF Publishers; 2018, 1–13.

2. Bakker AB, Demerouti E, Sanz-Vergel A, Rodriguez-Munoz A. Job Demands-Resources Theory: new developments over the last decade. J Work Organ Psychol 2023;39:157–67.

3. Zadow A, Dollard MF, Parker L, Storey K. Psychosocial safety climate: a review of the evidence. In: Dollard M, Dormann C, Awang Idris M, editors. *Psychosocial Safety Climate: A New Work Stress Theory*. Cham, Switzerland: Springer International Publishing; 2019, 31–75.

4. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. J Appl Psychol 2001;86(3):499–512.

5. Fattori A, Comotti A, Bordini L, Dollard MF, Bonzini M. Psychosocial safety climate (PSC) at middle management level in the healthcare sector: a contribution to the Italian validation of psychosocial safety climate-4. Front Psychol 2022;13:1046286.

6. Idris MA, Dollard MF. Psychosocial safety climate, work conditions, and emotions in the workplace: a Malaysian population-based work stress study. Int J Stress Manag 2011;18(4):324–47.

7. Law R, Dollard MF, Tuckey MR, Dormann C. Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement. Accid Anal Prev 2011;43(5):1782–93.

8. Afsharian A, Dollard MF, Ziaian T, Dormann C, Karimzadeh A. Psychosocial safety climate and PSC ideal: direct and interaction effects on JD-R for mental health, job satisfaction and work engagement (Iran). In: Dollard M, Dormann C, Awang Idris M, editors. *Psychosocial Safety Climate: A New Work Stress Theory*. Cham, Switzerland: Springer International Publishing; 2019, 273–303.

9. Yulita, Idris MA, Abdullah SS. Psychosocial safety climate improves psychological detachment and relaxation during off-job recovery time to reduce emotional exhaustion: a multilevel shortitudinal study. Scand J Psychol 2022;63(1):19–31.

10. Zadow AJ, Dollard MF, Dormann C, Landsbergis P. Predicting new major depression symptoms from long working hours, psychosocial safety climate and work engagement: a population-based cohort study. BMJ Open 2021;11(6):e044133.

11. Amstad FT, Meier LL, Fasel U, Elfering A, Semmer NK. A meta-analysis of work-family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. J Occup Health Psychol 2011; 16(2):151–69.

12. Greenhaus JH, Beutell NJ. Sources and conflict between work and family roles. Acad Manag Rev 1985;10(1):76–88.

13. Yucel D, Latshaw BA. How do mothers' and fathers' work-family conflict impact children's problem behaviors? J Fam Issues 2020;42(3):571–98.

14. Miller BK, Wan M, Carlson D, Kacmar KM, Thompson M. Antecedents and outcomes of work-family conflict: a mega-meta path analysis. PLoS One 2022;17(2):e0263631.

15. Yucel D, Borgmann LS. Work-family conflict and depressive symptoms among dual-earner couples in Germany: a dyadic and longitudinal analysis. Soc Sci Res 2022;104:102684.

16. Song J, Jiao H, Wang C. How work-family conflict affects knowledge workers' innovative behavior: a spillover-crossover-spillover model of dual-career couples. J Knowl Manag 2023;27(9):2499–525.

17. Matei A, Virga D. From family to work: the mediating role of family-work enrichment and conflict between communication and well-being for dual-earner couples. Curr Psychol 2022;42:14555–68.

18. Wan MM, Shaffer MA, Dou J, Zhang M, Zhang Y. A dyadic approach to examining dual-earner couples' boundary segmentation preferences and work-family conflict. Int J Stress Manag 2022;29(3):292–305.

19. Kenny DA, Kashy DA, Cook WL. *Dyadic Data Analysis*. New York, USA: Guilford Press; 2006.

20. Amoadu M, Ansah EW, Sarfo JO. Influence of psychosocial safety climate on occupational health and safety: a scoping review. BMC Public Health 2023;23(1):1344.

21. Parent-Lamarche A, Biron C. When bosses are burned out: psychosocial safety climate and its effect on managerial quality. Int J Stress Manag 2022;29(3):219–28.

22. Cook WL, Kenny DA. The Actor-Partner Interdependence Model: a model of bidirectional effects in developmental studies. Int J Behav Dev 2005;29(2):101–9.

23. Agyapong B, Obuobi-Donkor G, Burback L, Wei Y. Stress, burnout, anxiety and depression among teachers: a scoping review. Int J Environ Res Public Health 2022;19(17):10706.

24. Ozamiz-Etxebarria N, Idoiaga Mondragon N, Bueno-Notivol J, Perez-Moreno M, Santabarbara J. Prevalence of anxiety, depression, and stress among teachers during the COVID-19 pandemic: a rapid systematic review with meta-analysis. Brain Sci 2021;11(9):1172.

25. The National Union of Teaching Profession Malaysia. https://www.nutp.org.my/. Updated 2024. Accessed Febru-

ary 27, 2024.

26. Wijayanuddin A, Zulkifly NI. Work-family conflict and job burnout among public school female teachers in Malaysia during COVID-19. Int J Soc Policy Soc 2021;18(S1):64–80.

27. Malaysia education blueprint 2013-2025: annual report 2022. https://www.moe.gov.my/storage/files/shares/Dasar/PPPM/MEB%20Annual%20Report%202022.pdf. Updated 2023. Accessed February 27, 2024.

28. De Jonge J, Dormann C, Van Vegchel N, Von Nordheim T, Dollard M, Cotton S, et al. *DISQ-S 2.1:* De Verkorte DISC Vragenlijst Nederlandse Versie 2.1 [DISQ-S 2.1: The DISC Questionnaire Dutch Version 2.0]. Eindhoven, Netherlands: Technische Universiteit Eindhoven; 2009.

29. Bianchi R, Schonfeld IS. The Occupational Depression Inventory: a new tool for clinicians and epidemiologists. J Psychosom Res 2020;138:110249.

30. Carlson DS, Kacmar KM, Williams LJ. Construction and initial validation of a multidimensional measure of work-family conflict. J Vocat Behav 2000;56(2):249–76.

31. Hall GB, Dollard MF, Coward J. Psychosocial safety climate: development of the PSC-12. Int J Stress Manag 2010;17(4):353–83.

32. Hooper D, Coughlan J, Mullen MR. Structural equation modelling: guidelines for determining model fit. Electron J Business Res Methods 2008;6(1):53–60.

33. MacKinnon DP. *Introduction to Statistical Mediation Analysis*. New York, NY, USA: Taylor & Francis Group/Lawrence Erlbaum Associates; 2008.

34. MacKinnon DP, Valente MJ, Wurpts IC. Benchmark validation of statistical models: application to mediation analysis of imagery and memory. Psychol Methods 2018;23(4):654–71.

35. Dawson JF. Moderation in management research: what, why, when, and how. J Bus Psychol 2014;29:1–19.

36. Cohen J, Cohen P, West SG, Aiken LS. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. 3rd ed. Mahwah, NJ, USA: Lawrence Erlbaum Associates Publishers; 2003.

37. Liao H, Liang R, He H, Huang Y, Liu M. Work stress, burn-out, occupational commitment, and social support among Chinese pediatric nurses: a moderated mediation model. J Pediatr Nurs 2022;67:e16–23.

38. Yulita Y, Idris MA, Dollard MF. Effect of psychosocial safety climate on psychological distress via job resources, work engagement and workaholism: a multilevel longitudinal study. Int J Occup Saf Ergon 2022;28(2):691–708.

39. Mansour S, Tremblay DG. Work-family conflict/family-work conflict, job stress, burnout and intention to leave in the hotel industry in Quebec (Canada): moderating role of need for family friendly practices as "resource passageways". Int J Hum Resour Manag 2018;29(16):2399–430.

40. Bilodeau J, Marchand A, Demers A. Work, family, work-family conflict and psychological distress: a revisited look at the gendered vulnerability pathways. Stress Health 2020;36(1):75–87.

41. Grzywacz JG, Smith AM. Work-family conflict and health among working parents: potential linkages for family studies and social neuroscience. Fam Relat 2016;65(1):176–90.

42. Vahedi A, Krug I, Westrupp EM. Crossover of parents' work-family conflict to family functioning and child mental health. J Appl Dev Psychol 2019;62:38–49.

43. Hall GB, Dollard MF, Winefield AH, Dormann C, Bakker AB. Psychosocial safety climate buffers effects of job demands on depression and positive organizational behaviors. Anxiety Stress Coping 2013;26(4):355–77.

44. Inoue A, Eguchi H, Kachi Y, Tsutsumi A. Perceived psychosocial safety climate, psychological distress, and work engagement in Japanese employees: a cross-sectional mediation analysis of job demands and job resources. J Occup Health 2023;65(1):e12405.

45. Alshamsi AI, Santos A, Thomson L. Psychosocial safety climate moderates the effect of demands of hospital accreditation on healthcare professionals: a longitudinal study. Front Health Serv 2022;2:824619.

46. Podsakoff PM, MacKenzie SB, Podsakoff NP. Sources of method bias in social science research and recommendations on how to control it. Annu Rev Psychol 2012;63:539–69.