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ORIGINAL ARTICLE

Association between psychosomatic symptoms and work stress among Taiwan police officers

台灣員警身體化症狀與工作壓力關係探討

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Abstract The aim of the study was to explore the association between the severity of psychosomatic symptoms and perceived work stress among male police officers in southern Taiwan. By stratified random sampling, a total of 698 male police officers were recruited into this study (the response rate was 73.4%; 512 of 698). A structured self-administered questionnaire on demographic and working characteristics, the severity of psychosomatic symptoms, perceived work stress, and social support was used to collect data anonymously. The results of multiple regression analysis revealed that (1) the police officers who perceived high-work stress reported more severe psychosomatic symptoms than those who perceived low-work stress; and (2) perceived social support had a moderating effect on the association between severity of psychosomatic symptoms and perceived work stress. Perceived work stress is an indicator of psychosomatic symptoms in police officers. Strategies for reducing psychosomatic symptoms of police officers include police administrators taking into account the level of work stress as well as more attention being paid to the resources of social support.

摘要 本研究目的在探討南台灣男性員警的身體化症狀、工作壓力的關係。以分層隨機方式，抽取698位男性員警為研究對象，以匿名自填問卷方式收案，共有512位完成問卷調查（反應率73%）。問卷內容包括身體化症狀、工作壓力與社會支持。以多變數複迴歸分析個人屬性、工作

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屬性、社會支持變項及工作壓力感受，對身體化症狀嚴重度的影響。多變數迴歸分析結果顯示(1) 員警高工作壓力感受者其身體化症狀嚴重度顯著高於低工作壓力感受者；(2) 社會支持對員警的身體化症狀嚴重度與工作壓力感受具有調節作用。工作壓力是員警身體化症狀的指標，故建議在發展減少員警身體化症狀的策略時，除考量工作壓力程度外，尚需考量其所感受的社會支持。

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Introduction

Front-line police work has long been considered to be one of the most stressful occupations [1,2]. In Taiwan, front-line police work is primarily done by basic unit officers. Duties of basic unit police are broad and can be dangerous as most of their time is spent on patrol service [3]. Long work hours threaten police officers' health, safety, and performance [4]. Police officers experience parameters of work involving emergencies and violence as well as excessive workloads [5,6] and high mortality [7,8].

In 1984, Lazarus and Folkman's [9] stress appraisal process stated that perceived stress may not necessarily translate into negative outcomes, and external resources, such as social support may influence the onset and severity of psychosomatic symptoms. Social support was seen to have direct effect on future coping [10] and moderated the impact of work demands on personal accomplishment [11]. Cohen and Wills [12] in 1985 stated that social support can protect persons from the potentially pathogenic influence of stressful events (main effect); meanwhile, social support also has a buffering effect between stress and health. Perceived stress because of lack of support from either supervisors or friends is significantly positively associated with psychosomatic problems [13]. Psychosomatic symptoms may be the primary expression of stress [14,15] and may increase health care utilization [16].

Chinese males are especially accustomed to suppressing their emotions when experiencing work stress [17]. Chinese psychosomatic symptoms were related to their anxiety, depression, gender, age, education, stressors, and support [18,19]. Hong Kong research indicated that Chinese males do not discuss their stressful situations with their friends. When their psychosomatic symptoms appeared, they would choose not to seek medical help and believe that they could get better without any external help [20]. Health professionals working with Taiwanese male police officers must understand the association among their psychosomatic symptoms, perceived social support, and work stress and develop intervention strategies to help them [21].

The aim of the present study was to explore the association as well as moderating factor(s) (social support) between the severity of psychosomatic symptoms and perceived work stress among male police officers in the metropolitan areas of southern Taiwan. The previous studies found that age [8,22,23], education level [13,23,24], marriage status [25,26], working characteristics [8,26,27], and social support [11,13,22,23,26] were found to have significant main effects on psychosomatic symptoms and work stress. Work stress was also related to psychosomatic symptoms [8]. Cohen and Wills [12] concluded that social support had a buffering effect on stress and health. Therefore, we examined the interaction effect between social support and work stress and then detected the moderating effect between social support and work stress.

Methods

Samples

The current investigation is based on data from the Project for the Mental Health of Policemen. There were 4,300 police officers who had worked at least 1 year in their units in a metropolitan area in southern Taiwan. In our earlier work on police officers, we found that the work stress of males was different from that of females, in accordance with previous studies [2,28]. We therefore focused on male police officers in this study. According to the data of the police human resource department, there are 10 police districts and five corps teams in this area. By using stratified random sampling, 698 male police officers were recruited from five police districts and four corps teams for our study. The protocol was approved by the Institutional Review Board of Kaohsiung Medical University and the Police Administration Systems. Informed consent was obtained from each subject.

Instruments

We used a self-administered, structured questionnaire to collect data on the severity of psychosomatic symptoms and related factors. This questionnaire consisted of four parts.

The first section asked for participants' age, marriage status (married vs. unmarried or divorced), length of service as a policeman, level of education (bachelors or masters vs. associate degree), location of work (field vs. office work), and basic unit work. The police officers whose position ranked in the lowest level of police ranks in Taiwan police system were typically called "basic unit officers." Other police officers were classified as "nonbasic unit officers."

Second, a Psychosomatic Symptoms Scale was adapted from the Chinese version of the Occupational Stressor Indicator-2 (OSI-2) [29–31]. It comprises six items, including (1) feeling unaccountably tired or exhausted; (2) a tendency to eat, drink, or smoke more than usual; (3) shortness of breath or feeling dizzy; (4) muscles trembling (e.g. eye twitch); (5) pricking sensations or twinges; and (6) feeling uninterested in getting up in the morning. Responses were rated on a scale from "never" (1) to "very frequently" (6). Total scores ranged from 6 to 36, with a higher score representing more severe psychosomatic symptoms. The Cronbach's α coefficient for this variable in this study was 0.90, and the 2-week test-retest reliability (intra-class correlation coefficient) was 0.88 in a pilot study.

Next, we used the 39-item Perceived Work Stress Scale, adapted from the Chinese version of the OSI-2, to assess levels of perceived work stress [29–31]. The scale contained five dimensions of stress: duty role stress, organized

lead stress, personal achievement stress, challenge-taking stress, and family role stress. Responses were rated on a scale from "very definitely is not a stress source" (1) to "very definitely is a stress source" (6). Total scores ranged from 39 to 234, with a higher score indicating higher levels of perceived work stress. The Cronbach's α coefficient in this study was 0.97.

Finally, we used the 20-item Chinese version of the Personal Resource Questionnaire 85 (PRQ-85) Part 2 to measure police officers' perceived social support [32–35]. Rated responses were modified to conform to a scale ranging from "very much disagree" (1) to "very much agree" (4). Total scores ranged from 20 to 80. A higher score indicated a higher level of perceived social support. The Cronbach's α coefficient in this study was 0.91; and the 2-week interval test-retest reliability (intraclass correlation coefficient) was 0.78 in a pilot study.

Procedure

The researchers communicated with the administrators of police departments about the research aims and processes of collecting data, and the questionnaire was then sent to the police officers. In the questionnaire, we emphasized respect for participants' privacy and encouraged them to complete the survey anonymously. Researchers visited the police working departments to collect the completed questionnaires. Completed questionnaires could also be mailed back to the researchers.

Data analysis was performed using SPSS 15.0 (SPSS Inc., Chicago, IL, USA) statistical software. Descriptive statistics were used to describe participants' demographic and working characteristics (age, field work, low-educational level, single or disruptive marriage, and basic unit work), severity of psychosomatic symptoms, work stress, and social support. The association between severity of psychosomatic symptoms and perceived work stress was examined using multiple regression analysis to adjust for the effects of perceived social support.

We also used the criteria proposed by Baron and Kenny [36] in 1986 to examine whether perceived social support had a moderating effect on the association between severity of psychosomatic symptoms and level of perceived work stress. According to the criteria, moderation occurs when the interaction between the factor (work stress) and the hypothesized moderator (social support) is significantly associated with the dependent variable (severity of psychosomatic symptoms) after controlling for the buffering effects of both the factor and hypothesized moderator variable. In this study, if hypothesized moderator (social support) was significantly associated with severity of psychosomatic symptoms in multiple regression analysis, the interaction (work stress \times social support) was added to the multiple regression model to examine the moderating effect.

Finally, if the interaction was significantly associated with severity of psychosomatic symptoms in multiple regression analysis, we examined and determined the difference in the severity of psychosomatic symptoms between those with work stress regarding moderator (social support) by *t* test. A two-tailed *p* value of less than 0.05 was considered statistically significant.

Results

A total of 512 (73.4%) police officers completed the questionnaire without any omission. Their demographic and working characteristics, the severity of psychosomatic symptoms, and the levels of perceived work stress, and social support are shown in Table 1. The mean severity of psychosomatic symptoms was 18.9 [standard deviation (SD) = 7.1].

The association between the severity of psychosomatic symptoms and the perceived work stress examined by multiple regression analysis is shown in Table 2. After adjusting for the effects of age, field work, low-educational level, single or disruptive marriage, basic unit work, and perceived social support, the police officers who perceived high-work stress reported more severe psychosomatic symptoms than those who perceived low-work stress [$F(7,504) = 19.514, p < 0.001$; Model I]. The interaction between perceived work stress and perceived social support was further selected for regression analysis [$F(8,503) = 17.689, p < 0.001$; Model II]. The results indicated that the interaction between perceived work stress and perceived social support ($t = -2.021, p = 0.044$) was significantly associated with the severity of psychosomatic symptoms. The results indicated that perceived social support had an influence on the association between severity of psychosomatic symptoms and perceived work stress.

We further examined the difference in the severity of psychosomatic symptoms between participants with high- and low-work stress with regard to perceived high- and low-social support (Fig. 1). However, there is no established way of determining a cutoff level for the Perceived Work

Table 1 Distributions of demographic and working characteristics, the severity of psychosomatic symptoms, the levels of perceived work stress, and social support

| Characteristics | mean \pm SD | <i>n</i> (%) |
|-------------------------------|------------------|--------------|
| Psychosomatic symptoms | 18.9 \pm 7.1 | |
| Age (yr) | 36.8 \pm 7.2 | |
| Length of service (yr) | 13.6 \pm 6.0 | |
| Work location | | |
| Office | | 39 (7.6) |
| Field | | 473 (92.4) |
| Education | | |
| High (bachelor and master) | | 27 (5.3) |
| Low (associate) | | 485 (94.7) |
| Marriage status | | |
| Intact marriage | | 426 (83.2) |
| Single or disruptive marriage | | 86 (16.8) |
| Basic unit work | | |
| No | | 98 (19.1) |
| Yes | | 414 (80.9) |
| Work stress | 168.8 \pm 31.9 | |
| Social support | 56.3 \pm 7.8 | |

SD = standard deviation.

Table 2 The correlates of severity of psychosomatic symptoms: the multiple regression analyses

| Characteristics | Model I | | Model II | | VIF |
|-------------------------------|---------|-----------|----------|-----------|-------|
| | Beta | <i>t</i> | Beta | <i>t</i> | |
| Age | -0.036 | -0.806 | -0.038 | -0.842 | 1.307 |
| Low-education level | -0.101 | -2.350* | -0.096 | -2.247* | 1.177 |
| Single or disruptive marriage | 0.061 | 1.487 | 0.065 | 1.585 | 1.094 |
| Field work | 0.016 | 0.379 | 0.006 | 0.135 | 1.105 |
| Basic unit work | 0.151 | 3.379** | 0.151 | 3.386** | 1.277 |
| Social support | -0.161 | -4.056*** | -0.149 | -3.732*** | 1.033 |
| Work stress | 0.367 | 9.139*** | 0.351 | 8.630*** | 1.068 |
| Work stress × social support | — | — | -0.083 | -2.021* | 1.088 |
| <i>R</i> ² | | 0.213 | | 0.220 | |
| <i>F</i> | | 19.514 | | 17.689 | |
| <i>p</i> | | <0.001 | | <0.001 | |

Model is fully entered multiple regression; length of service is dropped for collinearity; all the independent variables (age, social support, and work stress) are centered before the regression; and the interaction terms (work stress × social support) is computed by the centered variable.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

VIF = variance inflation factor.

Stress Scale of the Chinese version of the OSI-2 or the PRQ-85 Part 2. A dominant approach using the upper or lower decile might increase the sensitivity and increase the probability of detecting effects [37]. Therefore, we classified participants with a total score on the Perceived Work Stress Scale or PRQ-85 Part 2 in the 50th percentile or greater as perceiving high-work stress (mean = 170) or social support (mean = 58). Results indicate that the severity of psychosomatic symptoms of low-social support officers (mean = 22.6, SD = 6.7) was greater than high-social support officers (mean = 19.2, SD = 6.7) among the high-work stress group ($t = 4.060$, $p < 0.001$). There were no significant differences in severity of psychosomatic symptoms between high- (mean = 16.6, SD = 6.4) and low-social support officers (mean = 17.2, SD = 7.1) among the low-work stress group ($t = 0.656$, $p = 0.512$). Furthermore, police officers who perceived low-social support rated severity of psychosomatic symptoms higher no matter how much work stress they reported.

Discussion

The first important finding of this study is that police officers who perceived high-work stress reported more severe

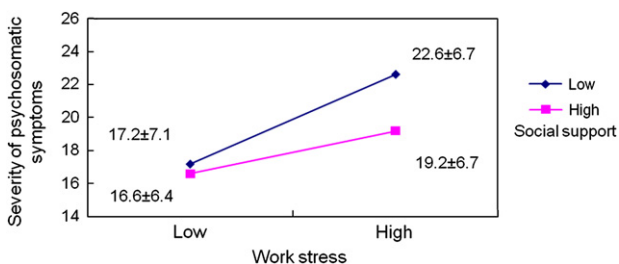


Figure 1. The association between severity of psychosomatic symptoms and perceived high- or low-work stress in officers who perceived high- or low-social support.

psychosomatic symptoms than those who perceived low-work stress after adjusting for age, field work, low-educational level, single or disruptive marriage, basic unit work, and perceived social support. This result is consistent with those of previous studies [38]. Perceived work stress is an indicator of psychosomatic symptoms in police officers. The police officers in this study, most who are Taiwanese males, with their psychosomatic symptoms might suppress their work stress and not seek medical help [20]. Police administration is difficult to evaluate the organizationally based stressors of these officers. Therefore, if the officers report potentially psychosomatic symptoms, the police administration could cooperate with the health care system to provide information to help manage their symptoms through the health care system (e.g. referrals to hotlines or web sites). If officers connect with the health care system, they may increase their support system. In addition, for the health promotion of police officers, we strongly suggest that health care systems cooperate closely with police administrators to provide officers information about support. Although the police administration has attempted to increase the number of psychologists in their Training and Educating Department, officers' psychosomatic symptoms have not displayed substantial improvement in part because mitigation of these symptoms involves physical and social support as well as psychological health. Furthermore, the Training and Educating Department evaluates officers' work performance as well as acting as a consulting department. Therefore, police officers have little confidence or motivation to seek help with their symptoms from this department as the department's role conflict is perceived as being possibly disadvantageous to one's career advancement.

The second important finding is that perceived social support influences the association between psychosomatic symptoms and perceived work stress in police officers. The difference in ratings of severity of psychosomatic symptoms between high- and low-work stress among low-social support officers was greater than that between the high-

social support officers. Police officers who perceived low-social support rated severity of psychosomatic symptoms higher no matter how much work stress they reported. This finding is consistent with previous research showing that low-social support at work is strongly associated with workers' psychosomatic symptoms [23]. However, Taiwanese police officers typically change their work place every few years, which may influence social support. In previous research, Chinese employee psychosomatic symptoms were positively associated with lack of support from either supervisors or friends [13]. Moreover, Chinese males were more likely to tell their parents but not their friends [20]. Therefore, police administrators should reconsider the policy of reassignment and pay greater attention to sources of social support from family or parents.

This study has some limitations with regard to generalizability by virtue of the narrow sample; the data were collected in a southern city of Taiwan, and the results may not be generalizable throughout Taiwan. Although the questionnaires were anonymous and we assured the respondents that their responses were confidential to minimize bias, self-reporting of data may have limited the results. For example, we had a limitation on identification of those subjects with existing personality or psychiatric disorders or other stated conditions. They might report more psychosomatic symptoms than those without these problems. Finally, although we conducted a cross-sectional study for evidence-based knowledge, future research using experimental designs may validate the findings of this study and provide more information to inform clinical practice and research.

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References

- [1] Wang Z, Inslicht SS, Metzler TJ, Henn-Haase C, McCaslin SE, Tong H, et al. A prospective study of predictors of depression symptoms in police. *Psychiatry Res* 2010;175:211–6.
- [2] Poteyeva M, Sun IY. Gender differences in police officers' attitudes: Assessing current empirical evidence. *J Crim Justice* 2009;37:512–22.
- [3] Ministry of the Interior. Analyzing the mortality and morbidity of the Taiwan police. Available at, <http://www.npa.gov.tw/NPAGip/wSite/np?ctNode=11358&mp=1>; 2011.
- [4] Vila B. Impact of long work hours on police officers and the communities they serve. *Am J Ind Med* 2006;49:972–80.
- [5] Miller L. Police officer suicide: causes, prevention, and practical intervention strategies. *Int J Emerg Ment Health* 2005;7:101–14.
- [6] Collins PA, Gibbs AC. Stress in police officers: a study of the origins, prevalence and severity of stress-related symptoms within a county police force. *Occup Med* 2003;53:256–64.
- [7] Deschamps F, Paganon-Badinier I, Marchand AC, Merle C. Sources and assessment of occupational stress in the police. *J Occup Health* 2003;45:358–64.
- [8] Gershon RR, Lin S, Li X. Work stress in aging police officers. *J Occup Environ Med* 2002;44:160–7.
- [9] Lazarus RS, Folkman S. *Somatic health. Stress, appraisal, and coping*. New York, NY: Springer; 1984. 205–235.
- [10] McColl MA, Lei H, Skinner H. Structural relationships between social support and coping. *Soc Sci Med* 1995;41:395–407.
- [11] Devereux JM, Hastings RP, Noone SJ, Firth A, Totsika V. Social support and coping as mediators or moderators of the impact of work stressors on burnout in intellectual disability support staff. *Res Dev Disabil* 2009;30:367–77.
- [12] Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. *Psychol Bull* 1985;98:310–57.
- [13] Chen WQ, Wong TW, Yu IT. Association of occupational stress and social support with health-related behaviors among Chinese offshore oil workers. *J Occup Health* 2008;50:262–9.
- [14] van Kamp I, van der Velden PG, Stellato RK, Roorda J, van Loon J, Kleber RJ, et al. Physical and mental health shortly after a disaster: first results from the Enschede firework disaster study. *Eur J Public Health* 2006;16:253–9.
- [15] Gerber M, Kellmann M, Hartmann T, Pühse U. Do exercise and fitness buffer against stress among Swiss police and emergency response service officers? *Psychol Sport Exerc* 2010;11:286–94.
- [16] Miranda J, Perez-Stable EJ, Munoz RF, Hargreaves W, Henke CJ. Somatization, psychiatric disorder, and stress in utilization of ambulatory medical services. *Health Psychol* 1991;10:46–51.
- [17] Li J, Yang W, Cho SI. Gender differences in job strain, effort-reward imbalance, and health functioning among Chinese physicians. *Soc Sci Med* 2006;62:1066–77.
- [18] Mak WW, Zane NW. The phenomenon of somatization among community Chinese Americans. *Soc Psychiatry Psychiatr Epidemiol* 2004;39:967–74.
- [19] Zantinge EM, Verhaak PF, Bensing JM. The workload of GPs: Patients with psychological and somatic problems compared. *Fam Pract* 2005;22:293–7.
- [20] Wong WCW, Lee WK, Tung BLS. Are Chinese men less susceptible to anxiety and depression? A community-based cross-sectional survey from Hong Kong. *J Mens Health Gen* 2006;3:152–9.
- [21] Kelloway EK, Day AL. Building healthy workplaces: what we know so far. *Can J Behav Sci* 2005;37:223–35.
- [22] Gini G, Carli G, Pozzoli T. Social support, peer victimisation, and somatic complaints: A mediational analysis. *J Paediatr Child Health* 2009;45:358–63.
- [23] Godin I, Kittel F. Differential economic stability and psychosocial stress at work: associations with psychosomatic complaints and absenteeism. *Soc Sci Med* 2004;58:1543–53.
- [24] Mandemakers JJ, Monden CWS. Does education buffer the impact of disability on psychological distress? *Soc Sci Med* 2010;71:288–97.
- [25] Waring EM. Marriages of patients with psychosomatic illness. *Gen Hosp Psych* 1983;5:49–53.
- [26] Brown J, Cooper C, Kirkcaldy B. Occupational stress among senior police officers. *Br J Psychol* 1996;87:31–41.
- [27] Nakao M. Work-related stress and psychosomatic medicine. *Biopsychosoc Med* 2010;4:4.
- [28] Sandmark H, Renstig M. Understanding long-term sick leave in female white-collar workers with burnout and stress-related diagnoses: A qualitative study. *BMC Public Health* 2010;10:210.
- [29] Lu L, Cooper C, Chen YC, Hsu CH, Li CH, Wu HL, et al. Chinese version of the OSI: a study of reliability and factor structures. *Stress Med* 1995;11:149–55.
- [30] Lu L, Cooper C, Chen YC, Hsu CH, Wu HL, Shih JB, et al. Chinese version of the OSI: a validation study. *Work & Stress* 1997;11:79–86.

- [31] Lu L, Tseng HJ, Cooper CL. Managerial stress, job satisfaction and health in Taiwan. *Stress Med* 1999;15:53–64.
- [32] Brandt PA, Weinert C. The PRQ—a social support measure. *Nurs Res* 1981;30:277–80.
- [33] Weinert C, Brandt PA. Measuring social support with the Personal Resource Questionnaire. *West J Nurs Res* 1987;9: 589–602.
- [34] Weinert C. Evaluation of the Personal Resource Questionnaire: a social support measure. *Birth Defects Orig Artic Ser* 1984;20: 59–97.
- [35] Weinert C. A social support measure: PRQ85. *Nurs Res* 1987; 36:273–7.
- [36] Baron R, Kenny D. The moderator-mediator variables distinction in social psychological research: conceptual, strategic, and statistical consideration. *J Pers Soc Psychol* 1986;51: 1173–82.
- [37] Akerstedt T, Knutsson A, Westerholm P, Theorell T, Alfredsson L, Kecklund G. Sleep disturbances, work stress and work hours: a cross-sectional study. *J Psychosom Res* 2002;53: 741–8.
- [38] Umehara K, Ohya Y, Kawakami N, Tsutsumi A, Fujimura M. Association of work-related factors with psychosocial job stressors and psychosomatic symptoms among Japanese pediatricians. *J Occup Health* 2007;49:467–81.