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BASIC RESEARCH ARTICLE

Social support and acute stress symptoms (ASSs) during the COVID-19 outbreak: deciphering the roles of psychological needs and sense of control

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ABSTRACT

Background: A cute stress symptoms (ASSs) are likely to be a common mental health problem in the acute period following the 2019 novel coronavirus pneumonia (COVID-19) outbreak. To address this risk, substantial social support has been provided to relieve ASSs during the COVID-19 outbreak. However, the effectiveness of these support methods for relieving ASSs has not yet been assessed.

Objective: The current study sought to examine the underlying mechanisms by which social support relieves ASSs, among primary and secondary school teachers.

Method: A sample of 751 primary and secondary school teachers was selected to answer self-reported questionnaires regarding ASSs, social support, psychological needs, and the sense of control.

Results: Structural equation modelling revealed that social support had a non-significant direct relationship with ASSs, and a significant indirect relationship with reduced ASSs via the needs for autonomy and relatedness, and via the paths from three types of psychological needs to the sense of control.

Conclusion: These findings suggest that social support can play a relieving role in ASSs when the support satisfies individuals' psychological needs and improves their sense of control. To alleviate ASSs among primary and secondary school teachers, more attention should be paid to satisfying their specific psychological needs and improving their sense of control.

HIGHLIGHTS
Social support can play a relieving role in ASSs when the support satisfies individuals' psychological needs and improves their sense of control during COVID-19 outbreak.

Soporte social y sintomas de estres agudo (SEAs) durante el brote del COVID-19: decifrando los roles de las necesidades psicológicas y la sensación de control

Antecedentes: Es probable que los síntomas de estrés agudo (SEAs) sean un problema de salud mental frecuente en el periodo agudo que sigue al nuevo brote de neumonía por coronavirus 2019 (COVID-19). Para enfrentar este riesgo, se ha brindado un considerable soporte social para aliviar los SEAs durante el brote del COVID-19. Sin embargo, aún no se han evaluado la efectividad de estos métodos de soporte para aliviar los SEAs.

Objetivo: Para cubrir esta brecha, este estudio buscó evaluar los mecanismos subyacentes mediante los cuales el soporte social alivia los SEAs en profesores de escuelas primarias y secundarias.

Método: Se tomó una muestra de 751 profesores de escuelas primarias y secundarias para que respondieran cuestionarios de auto-reporte relacionadas con SEAs, soporte social, necesidades psicológicas y la sensación de control.

Resultados: El modelo de ecuaciones estructurales reveló que el soporte social tenía una relación directa, no significativa, con los SEAs; y que tenía una relación significativa indirecta con una reducción de los SEAs a través de las necesidades de autonomía y relación, y a través de las vías de tres tipos de necesidades psicológicas de la sensación de control.

Conclusiones: Estos hallazgos sugieren que el soporte social puede desempeñar un papel de alivio sobre los SEAs cuando el soporte satisface las necesidades psicológicas de los individuos y mejora su sensación de control. Para aliviar los SEAs entre los profesores de escuelas primarias y secundarias, se debe prestar más atención en satisfacer sus necesidades específicas y mejorar su sensación de control.

COVID-19爆发期间社会支持和急性应激症状（ASS）：心理需求和控制感的作用

背景：在2019年新型冠状病毒性肺炎 (COVID-19) 爆发后的急性期, 急性应激症状 (ASSs) 可能是常见的心理健康问题。为解决此风险, 在COVID-19爆发期间, 已提供了大量的社会支持以缓解ASS。但是, 尚未评估这些支持方法缓解ASS的有效性。

目的：当前的研究试图考查中小学教师中社会支持减轻ASS的潜在机制。

方法：选择751名中小学教师作为样本, 以回答ASS, 社会支持, 心理需求和控制感相关的自我报告问卷。

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结果：结构方程模型显示，社会支持与ASS之间有不显著的直接关系，与减轻的ASS之间存在通过对自主性与关系的需求及从三类心理需求到控制感的路径的显著的间接关系。
结论：这些发现表明，当社会支持可以满足个人的心理需求并提高其控制感时，它们可以在ASS中起到缓解作用。为了减轻中小学教师的ASS，应更加注意满足其特定心理需求并提高他们的控制感。
关键词：急性应激症状; 社会支持; 心理需求; 控制感

1. Introduction

The 2019 novel coronavirus pneumonia (COVID-19) outbreak, a major public health emergency, has caused many deaths globally. There is currently a lack of targeted medical treatment and vaccines for this disease, and it continues to exhibit rapid transmission with a high level of infectiousness in the general population. In the context of this large-scale public health event, some affected individuals have been reported to exhibit mental health problems, including stress, anxiety, depressive symptoms, fear, denial, and anger (Kang et al., 2020). Because the present situation constitutes the acute stress phase of COVID-19, these symptoms can be considered as acute stress symptoms (ASSs). Acute stress reactions have been reported to impair individuals' immune systems (Tao, 2006), leading to negative impacts on daily life and reduced wellbeing (Holbrook et al., 2005). Importantly, ASSs in primary and secondary school teachers may be more serious than those among the general population during the COVID-19 outbreak, because these individuals are not only confronted with mental health problems caused by COVID-19, but also undertake the responsibility for teaching and caring for students exhibiting mental health problems in class. If teachers' psychological distress is not relieved in a timely way, their teaching and overall wellbeing may be affected, with direct effects on students' mental health (Chen et al., 2014), potentially aggravating students' psychological distress during the COVID-19 outbreak. Protecting against ASSs in teachers is thus important for their own long-term health and teaching quality, as well as students' long-term health, following COVID-19.

However, few studies have examined effective methods for relieving ASSs in teachers. A proposed theoretical framework for thriving through relationships (Feeney & Collins, 2014) suggests that providing individuals with social support may be a useful approach for relieving ASSs. In this framework, social support can provide a safe environment for the expression of negative emotion, helping individuals to reframe their understanding of their own experiences (Feeney & Collins, 2015). Social support also provides emotional comfort, reassurance, and acceptance to affected individuals, which can enable individuals to have positive appraisals of themselves and increase their faith in their ability to cope with adverse experiences (Zhou, Wu, Wang, & Tian, 2019). Moreover, as an important component of social support, providing instrumental aid (e.g. social resources; specific suggestions in coping with adversity) can directly alleviate negative emotions and adverse experiences (Feeney & Collins, 2014). Most previous studies of this issue have reported that social support is associated with less psychological distress following stressful experiences (Dworkin, Ojalehto, Bedard-Gilligan, Cadigan, & Kaysen, 2018; Smith et al., 2013; Stanley et al., 2019).

Furthermore, the framework of thriving through relationships suggests that social support exerts a buffering effect on psychological reactions via mediators, with basic psychological needs (e.g. needs of competence, relatedness, and autonomy) and the sense of control being considered as two important mediators (Feeney & Collins, 2014). Here, basic psychological needs refer to individuals' beliefs that they are effective in their activities, that their behaviours are self-detected, and that they experience closeness to others, entailing the needs for autonomy, competence, and relatedness, respectively (Ryan & Deci, 2000). Several previous studies suggest that social support can help people to build positive interpersonal relationships and satisfy individuals' need for relatedness, provide individuals with useful coping strategies and meet their need for competence, as well as giving individuals emotional support and encouragement and thus addressing their need for autonomy (Adie, Duda, & Ntoumanis, 2008; Skinner, Furrer, Marchand, & Kindermann, 2008; Tian, Tian, & Huebner, 2016). Furthermore, self-determination theory (Deci & Ryan, 2000) suggests that individuals who are able to meet these psychological needs can employ adaptive capacities to engage in activities, build a cohesive social group and obtain available resources and mutual protection, as well as regulating their own actions in accord with their available capacities, and thus coordinating and prioritizing processes towards more effective self-maintenance. In turn, these processes can facilitate the improvement of individuals' wellbeing and relieve their psychological distress (Alcaraz-Ibáñez, Sicilia, & Burgueño, 2017; Auclair-Pilote, Lalande, Tinawi, Feyz, & de Guise, 2019; Kormas, Karamali, & Anagnostopoulos, 2014; Ng et al., 2012). Taken together, these previous findings suggest that social support might have an indirect relationship with ASSs by satisfying three types of psychological need.

The sense of control is reported to act as a mediator between social support and ASSs, referring to an individual's generalized belief that they can and do master, control, and shape their own life (Keeton, Perry-Jenkins, & Sayer, 2008). The sense of control represents a type of cognitive resource (Keeton et al., 2008), which can be influenced by social factors such as social support (Gadalla, 2009). For example, previous studies have suggested that providing individuals with instrumental support can ensure that they have sufficient resources to cope with events (Green & Rodgers, 2001), whereas emotional support facilitates positive cognitions regarding the individual being in control of the events that they experience (Martire, Stephens, & Townsend, 1998), increasing their sense of control (Gadalla, 2009). Improving an individual's sense of control can decrease passivity and helplessness in the face of adversity, and ultimately relieve psychological distress (Assari, 2019; Bennetter, Clench-Aas, & Raanaas, 2016; Keeton et al., 2008). Therefore, in the current study, we hypothesized that social support would be associated with reduced ASSs, via improving individuals' sense of control.

Drawing on previous theories and studies, social support might be related to reduced ASSs via satisfying psychological needs and improving the sense of control, respectively. This possibility raises the question of whether these two mediators could also exhibit some relationships involved in the mechanisms by which social support relieves ASSs. Self-determination theory (Deci & Ryan, 2000) suggests that satisfying psychological needs can increase individuals' subjectively felt energy, such as vitality (Ryan, Bernstein, & Brown, 2010), as well as helping individuals select and sustain behaviours to meet their goals (Ryan, Kuhl, & Deci, 1997), and increase individuals' ability to cope with events (Deci & Ryan, 2000). These processes can improve individuals' sense of control (Froreich, Vartanian, Zawadzki, Grisham, & Touyz, 2017; Hanfstingl, Andreitz, Müller, & Thomas, 2010). That is, psychological needs satisfaction may be associated with a greater sense of control. This notion suggests that social support may be related to a reduction in ASSs via the path from satisfying psychological needs to improving the sense of control.

While the framework of thriving through relationships emphasizes psychological needs and the sense of control as important mediators between social support and psychological outcomes following adversity (Feeney & Collins, 2014), the specific roles of these mediators have not yet been examined in depth. Furthermore, previous studies have not integrated Feeney and Collins (2014) theory with self-determination theory (Deci & Ryan, 2000) into a broader theoretical framework to assess the combined role of distinct factors in psychological distress. Moreover, it is currently unclear whether the three types of psychological needs play distinct mediating roles between social support and psychological distress. To fill these gaps, the current study was conducted to examine the mediating roles of psychological needs and the sense of control between social support and ASSs. Because more serious psychological distress is likely to occur among primary and secondary school teachers compared with the general population, the current study focused on this group.

2. Methods

2.1. Participants and procedures

This study began on 12 March 2020, during the COVID-19 outbreak. According to a report by the National Health Commission of the People's Republic of China, the cumulative number of confirmed cases in mainland China was 80,813 as of 12 March 2020, and the cumulative number of deaths was 3176 (National Health Commission of the People's Republic of China, 2020). In the current study, we focused on primary and secondary school teachers. Because schools were closed to reduce the likelihood of teachers and students becoming infected with COVID-19, teachers were working from home during the study period. Meanwhile, people were asked to keep at least 1-metre distance from others in public places. We conducted an Internet-based survey to assess psychological responses among teachers. Using the WeChat platform (a free messaging and calling app that is widely used in China), we sent an internet-based questionnaire to primary and secondary school teachers and invited them to respond. After respondents completed the questionnaire, they were asked to send the questionnaire to friends who were also teachers, via WeChat. Using this method, we recruited 759 participants in several provinces in China. Eight questionnaires were considered invalid because incorrect information was provided, leaving a total of 751 participants in the final analysis. The mean age of the participants was 40.02 (SD = 8.40) years, ranging from 19.0 to 59.0 years. Among the participants, 257 (34.2%) were female, and 494 (65.8%) were male.

This project was approved by the Research Ethics Committee of Department of Psychology and Behavioural Sciences, Zhejiang University. Informed consent was obtained from each participant. Electronic credits were provided for participants as compensation (1–2 CNY) via WeChat's 'red envelope' feature after the investigation was completed.

2.2. Measures

2.2.1. Social support

Zhen, Quan, and Zhou (2018) revised Received Social Support Questionnaire was used to assess teachers' social support. This questionnaire included 12 items. Responses were given on a 5-point scale ranging from 1 (never) to 5 (always). This questionnaire was reported to exhibit good reliability in a previous study of flood victims (Zhen et al.,

2018). For the current study, the internal reliability of the modified inventory was found to be good (Cronbach's alpha = 0.92).

2.2.2. Psychological needs

Sheldon and Niemiec (2006) basic psychological needs scale was used to assess primary and secondary teachers' psychological needs. This scale has nine items, and is divided into three subscales entailing the need for autonomy (three items; e.g. 'In my life, my choices are based on my interests and values'), the need for competence (three items; e.g. 'I feel very capable in what I do'), and the need for relatedness (three items; e.g. 'I feel close and connected with other people who are important to me'). All the items were rated on a 6-point scale ranging from 1 (completely disagree) to 6 (completely agree). This scale showed good reliability in previous studies (Sheldon & Niemiec, 2006). In this study, the reliability for this subscale was good (Cronbach's alpha = 0.80).

2.2.3. Sense of control

The sense of control subscale in the feelings of safety scale developed by An, Cong, and Wang (2004) was used to assess teachers' sense of control. This scale showed good reliability in previous studies (Zhou, Wu, Wang, & Tian, 2018). This subscale has eight items, which are rated on a 5-point scale ranging from 1 (completely disagree) to 5 (completely agree). In the current study, this subscale showed good reliability (Cronbach's alpha = 0.90).

2.2.4. ASSs

Fourteen items of the DSM-5 Acute Stress Disorder Diagnostic Criteria B (American Psychiatric Association, 2013) were used to assess the teachers' ASSs. These items were rated on a 2-point scale in which 0 represented 'no' and 1 represented 'yes'. DSM-5 ASD show good validity in previous study (McKinnon et al., 2016). In the current study, the questionnaire exhibited good reliability (Cronbach's alpha = 0.86).

2.3. Data analysis

To examine the mediating role of psychological needs and sense of control between social support and ASSs, Mplus 7.0 software (Muthén & Muthén, 2012) was used to build a multiple mediating effects model. The model included hypothesized paths from social support to three types of psychological needs, sense of control, and ASSs, in which all of the variables were scale mean scores rather than latent variables. In addition, hypothesized paths from three types of psychological needs to the sense of control and ASSs, and a hypothesized path from the sense of control to ASSs, were added to the model. In all of the above models, we added the correlation paths between three types of psychological needs to reduce the chance of type I errors. Next, bias-corrected bootstrap confidence intervals with a 95% confidence interval (CI) were used to evaluate the significance of the direct and indirect effects. Here, we extracted 5000 bootstrap samples and ran the model shown in Figure 1. The 95% CI was used for identifying the significance of the paths. If the 95% CI included 0 in one direct path, we considered the path to be non-significant. In contrast, if a path did not include 0 in the 95% CI, it was considered significant.

To evaluate the model fit, we used chi-square values, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) values. The general cut-offs for model acceptance were ≥ 0.90 for CFI and TLI, and < 0.08 for SRMR and RMSEA. Maximum likelihood estimation (ML) was used in the estimation procedure in this study.

3. Results

3.1. Descriptive statistics and correlation among main variables

Based on the DSM-5 diagnostic algorithm for acute stress disorder (ASD) (the presence of nine [or more] of the following symptoms from any of the five categories of intrusion, negative mood, dissociation,
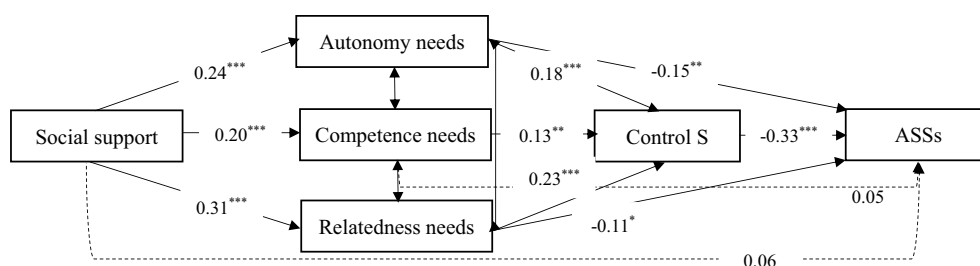

Figure 1. The mediating effect of psychological needs and the sense of control; Control S = Sense of control, ASSs = Acute stress symptoms.
**p < 0.01, ***p < 0.001

Table 1. Correlations between main variables.

Variables	M(SD)	1	2	3	4	5
1. Social support	32.78 (9.95)	1				
2. Autonomy needs	11.64 (2.36)	0.24***	1			
3. Competence needs	12.74 (2.49)	0.20***	0.57***	1		
4. Relatedness needs	12.34 (2.50)	0.31***	0.59***	0.67***	1	
5. Sense of control	27.87 (6.24)	0.06	0.39***	0.39***	0.42**	1
6. ASSs	3.06 (3.30)	−0.02	−0.30***	−0.22***	−0.29***	−0.41***

***$p < 0.001$; ASSs = Acute stress symptoms

avoidance, and arousal, beginning or worsening after the traumatic event[s] occurred), a total of 68 (9.1%) participants were identified as having probable ASD. Next, we assessed the descriptive statistics and correlations among social support, psychological needs, the sense of control, and ASSs (see Table 1), and the main variable scale mean scores were shown. The results revealed that social support exhibited a significant positive relationship with three types of psychological needs, but not the sense of control and ASSs. In addition, three types of psychological needs showed significant positive relationships with the sense of control and a negative association with ASSs, and the sense of control was negatively associated with ASSs.

3.2. Mediating roles of psychological needs and the sense of control

Based on the correlation analysis and the hypothesized mediation model, we found that social support exhibited a non-significant direct relationship with the sense of control and ASSs. However, because the aim of this study was to examine the indirect relationship between social support and ASSs, the direct relationship between social support and ASSs should also be assessed. Thus, we built the following model, in which only one path from social support to the sense of control was not included (see Figure 1). The model exhibited acceptable index values: χ^2 (1) = 7.057, CFI = 0.995, TLI = 0.927, RMSEA (90% CI) = 0.090 (0.037–0.157), SRMR = 0.017. We found that social support had a non-significant association with ASSs, and possibly had a negative indirect relationship with ASSs via psychological needs and the sense of control.

Next, bias-corrected bootstrap CIs were used to estimate the direct relationship between social

support and ASSs, and the indirect relationship between social support and ASSs via psychological needs and sense of control. Based on this criterion and the bootstrap results (see Table 2), we found that social support exhibited a non-significant association with ASSs, but a negative indirect relationship with ASSs via the needs for autonomy or relatedness, but not the need for competence, whereas social support had a negative indirect relationship with ASSs via three multiple indirect paths from all three types of psychological needs to the sense of control.

4. Discussion

To our knowledge, this is the first study to examine the mediating role of basic psychological needs (e.g. needs of competence, relatedness, and autonomy) and the sense of control between social support and ASSs in teachers during the COVID-19 outbreak. The findings showed that the prevalence of ASS in teachers is 9.1%. This suggests that teachers had relatively serious ASS during the COVID-19 epidemic, and carrying out psychological service to teachers is of great importance. Furthermore, we find that social support has non-significant direct effects on ASSs, whereas social support has significant negative effects on ASSs via psychological needs and the sense of control. Furthermore, these findings indicate that providing social support should satisfy teachers' needs and promote their sense of control, and, in turn, buffer the severity of ASSs. Thus, if social support does not affect teachers' psychological needs and sense of control, then the buffering role of social support in ASSs may not be exhibited.

The current results revealed that social support had a non-significant direct relationship with ASSs. This finding did not support our hypothesis, but was in accord with the results of several previous studies

Table 2. Bias-corrected bootstrap tests of mediating effects.

Paths from social support to ASSs	95% CI	β
Direct effect	(−0.009, 0.129)	0.060
Indirect via autonomy needs	(−0.056, −0.012)	−0.034
Indirect via competence needs	(−0.011, 0.031)	0.010
Indirect via relatedness needs	(−0.064, −0.006)	−0.035
Indirect via autonomy needs and sense of control	(−0.022, −0.005)	−0.014
Indirect via competence needs and sense of control	(−0.017, −0.001)	−0.009
Indirect via relatedness needs and sense of control	(−0.036, −0.012)	−0.024

A 95% confidence interval of an indirect path coefficient that does not include 0 suggests that the indirect path is significant.

(Ellis, Nixon, & Williamson, 2009; McCanlies, Gu, Andrew, Burchfiel, & Violanti, 2017; Zhou, Wu, & Zhen, 2017). A possible explanation is that teachers received substantial support from others over time since the COVID-19 outbreak, enabling adaptive responses to constant social support, which may have had a non-significant effect on psychological outcomes. Only when social support from others can satisfy teachers' basic psychological needs and improve their sense of control, the support then relieves teachers' ASSs. Thus, the present findings support Feeney and Collins (2014) theoretical framework for thriving through relationships.

Furthermore, we found that social support had an indirect association with reduced ASSs via the need for relatedness and via the path from the need for relatedness to the sense of control. When people came together to fight the epidemic during the COVID-19 outbreak, teachers may have received increased social support from others, helping them build positive interpersonal relationships, and satisfying their need for relatedness. Satisfying these needs can help teachers to share their experiences and emotional state with others (Liu et al., 2016), increasing interpersonal discussions regarding adversity, which can help them to reconstruct their understanding from diverse perspectives (Zhen et al., 2018). In addition, satisfying the need for relatedness may also inform positive interpersonal relationships. This process could encourage the development of requisite skills, provide instrumental or informational assistance in attaining necessary resources, accommodate strategies for pursuing goals, and provide direct instruction or feedback (Feeney & Collins, 2014). These processes can increase an individual's sense of control and thus decrease passivity and helplessness in the face of adversity, ultimately relieving psychological distress (Assari, 2019; Bennetter et al., 2016; Keeton et al., 2008).

Similarly, we also found that social support exhibited a significant indirect relationship with reduced ASSs via the need for autonomy and via the path from the need for autonomy to the sense of control. Social support can provide individuals with emotional companionship, reassurance, and encouragement, improving their beliefs regarding self-direction and personal choices, and thus may also satisfy the need for autonomy (Adie et al., 2008; Skinner et al., 2008; Tian et al., 2016). In the framework of self-determination theory (Deci & Ryan, 2000), the need for autonomy was considered as teachers' core intrinsic motivation, indicating that the organism endeavours to incorporate more complex aspects of the world into its own organization (Ryan et al., 1997), enabling teachers to take cognitive strategies to integrate and process the external environment, and in turn reframe their understanding of

adverse experiences, finally relieving the effect of adverse environments on individuals. In addition, the need for autonomy as an intrinsic motivation can facilitate the acquisition of diverse competencies and the discovery of specific talents (Deci, 1975). This can increase teacher's sense of mastery in handling adversity, improve their engagement in addressing adversity, and relieve their psychological distress.

The current results revealed that social support exhibited non-significant relationships with reduced ASSs via a one-step effect of the need for competency, but exhibited a significant association with reduced ASSs via the path from the need for competency to the sense of control. This finding indicates that the need for competency can exhibit an indirect relationship with reduced ASSs, by providing a sense of control. Here, social support can provide individuals with more resources to help them to cope with adversity (Hobfoll, Freedy, Lane, & Geller, 1990), potentially increasing individuals coping efficacy, strengthening beliefs regarding their ability to handle adversity (Saltzman & Holahan, 2002), and improving their sense of control (Aspinwall & Richter, 1999), which may be related to reduced ASSs. That is, the need for competency may primarily play a relieving role in psychological distress through improving the sense of control.

Furthermore, the current results did not reveal a direct relationship between social support and the sense of control. Thus, a one-step indirect effect of the sense of control between social support and ASSs was not found in this study. One potential explanation is that psychological needs played a complete mediating role between these factors. This finding also extends previous studies (Gadalla, 2009), suggesting that when social support meets teachers' psychological needs, it can improve the sense of control and relieve ASSs.

The current study involved several limitations that should be considered. First, because the study sample only included primary and secondary school teachers, care should be taken when generalizing the current findings to other populations. Second, many factors may have influenced individuals' ASSs during the COVID-19 outbreak, but this study only assessed the roles of social support, psychological needs, and the sense of control. Future studies should include more factors to examine the development of ASSs in more depth. Third, because the current study had a cross-sectional design, no firm conclusions can be drawn regarding causal relationships.

Despite these limitations, the current study is the first to examine the underlying mechanisms by which social support relieves ASSs among primary and secondary school teachers in the acute stress phase of the COVID-19 outbreak. The current findings suggested that social support can play a relieving role when support satisfies teachers' three basic psychological needs

and improves their sense of control, in accord with Feeney and Collins (2014) theoretical framework for thriving through relationships and self-determination theory (Deci & Ryan, 2000). The current findings have important clinical implications. During the COVID-19 outbreak, as people come together to fight the epidemic, the government, social services, and other groups can provide individuals with more social support. Thus, it is important to develop methods for maximizing the effect of social support in relieving psychological distress. The current findings suggest that social support should be targeted to individuals' psychological needs to improve their sense of control, and that this, in turn, can relieve individuals' psychological distress.

Several specific recommendations for relieving teachers' ASS were proposed according to these findings. First, providing information support, including information about the COVID-19 epidemic (e.g. causes, transmission ways, precautions, number and places of confirmed case, etc.), information about the psychological and behavioural reactions being exposed to the epidemic (e.g. prevalence rate, characteristics, etc.), and information about self-assessment and available coping skills of these physiological and behavioural reactions (e.g. progressive relaxation practice, bellying breathing, safe island technology, etc.). These can normalize teacher's reactions to the COVID-19 epidemic, develop a comprehensive cognition about what has happened, increase their feelings of control and self-efficacy in coping, and finally relieve the severity of their ASSs. Second, helping teachers to build a good interpersonal relationship with family, friends, and others, improving their beliefs in personal choices, in order to meet their needs of relatedness and autonomy. In such ways, teachers are more willing to disclose and share their experiences and emotions, which provides an approach to reconstruct their negative cognition to the COVID-19 epidemic and relieve their ASSs. Third, it is important to establish specific channels for them, and tell them how to seek professional psychological help if they need.

Disclosure statement

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References

Adie, J. W., Duda, J. L., & Ntoumanis, N. (2008). Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion*, 32(3), 189–199.

Alcaraz-Ibáñez, M., Sicilia, Á., & Burgueño, R. (2017). Social physique anxiety, mental health, and exercise: Analyzing the role of basic psychological needs and psychological inflexibility. *Spanish Journal of Psychology*, 20, E16.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5 ed.). Arlington, VA: Author.

An, L., Cong, Z., & Wang, X. (2004). Research of high school students' security and the relatied factors. *Chinese Mental Health Journal*, 18, 717–719.

Aspinwall, L. G., & Richter, L. (1999). Optimism and self-mastery predict more rapid disengagement from unsolvable tasks in the presence of alternatives. *Motivation and Emotion*, 23(3), 221–245.

Assari, S. (2019). High sense of mastery reduces psychological distress for African American women but not African American men. *Archives of General Internal Medicine*, 3(1), 5–9.

Auclair-Pilote, J., Lalande, D., Tinawi, S., Feyz, M., & de Guise, E. (2019). Satisfaction of basic psychological needs following a mild traumatic brain injury and relationships with post-concussion symptoms, anxiety, and depression. *Disability and Rehabilitation*, 1–9. doi:10.1080/09638288.2019.1630858

Bennetter, K. E., Clench-Aas, J., & Raanaas, R. K. (2016). Sense of mastery as mediator buffering psychological distress among people with diabetes. *Journal of Diabetes and Its Complications*, 30(5), 839–844.

Chen, J. L., Xin-Chun, W. U., Zeng, P. P., Zhou, X., Xiong, G. Y., & Psychology, S. O. (2014). The relationship between PTSD and PTG: Evidence from longitudinal study of teachers survived in Wenchuan earthquake. *Psychological Development & Education*, 30, 75–81.

Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

Dworkin, E. R., Ojalehto, H., Bedard-Gilligan, M. A., Cadigan, J. M., & Kaysen, D. (2018). Social support predicts reductions in PTSD symptoms when substances are not used to cope: A longitudinal study of sexual assault survivors. *Journal of Affective Disorders*, 229, 135–140.

Ellis, A. A., Nixon, R. D., & Williamson, P. (2009). The effects of social support and negative appraisals on acute stress symptoms and depression in children and adolescents. *British Journal of Clinical Psychology*, 48 (4), 347–361.

Feeney, B. C., & Collins, N. L. (2014). A new look at social support: A theoretical perspective on thriving through relationships. *Personality & Social Psychology Review*, 19 (2), 113–147.

Feeney, B. C., & Collins, N. L. (2015). Thriving through relationships. *Current Opinion in Psychology*, 1, 22–28.

Froreich, F. V., Vartanian, L. R., Zawadzki, M. J., Grisham, J. R., & Touyz, S. W. (2017). Psychological need satisfaction, control, and disordered eating. *British Journal of Clinical Psychology*, 56(1), 53–68.

Gadalla, T. M. (2009). Sense of mastery, social support, and health in elderly Canadians. *Journal of Aging Health*, 21 (4), 581–595.

Green, B. L., & Rodgers, A. (2001). Determinants of social support among low-income mothers: A longitudinal

analysis. *American Journal of Community Psychology*, *29*(3), 419–441.

Hanfstingl, B., Andreitz, I., Müller, F. H., & Thomas, A. (2010). Are self-regulation and self-control mediators between psychological basic needs and intrinsic teacher motivation? *Journal for Educational Research Online*, *2*, 55–71.

Hobfoll, S. E., Freedy, J., Lane, C., & Geller, P. (1990). Conservation of social resources: Social support resource theory. *Journal of Social and Personal Relationships*, *7*(4), 465–478.

Holbrook, T. L., Hoyt, D. B., Coimbra, R., Potenza, B., Sise, M., & Anderson, J. P. (2005). High rates of acute stress disorder impact quality-of-life outcomes in injured adolescents: Mechanism and gender predict acute stress disorder risk. *Journal of Traumatic Stress*, *59*, 1126–1130.

Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X., … Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet Psychiatry*, *7*(3), e14.

Keeton, C. P., Perry-Jenkins, M., & Sayer, A. G. (2008). Sense of control predicts depressive and anxious symptoms across the transition to parenthood. *Journal of Family Psychology*, *22*(2), 212–221.

Kormas, C., Karamali, G., & Anagnostopoulos, F. (2014). Attachment anxiety, basic psychological needs satisfaction and depressive symptoms in university students: A mediation analysis approach. *International Journal of Psychological Studies*, *6*(2), 1–10.

Liu, Y., Liu, R.-D., Ding, Y., Wang, J., Zhen, R., & Xu, L. (2016). How online basic psychological need satisfaction influences self-disclosure online among Chinese adolescents: Moderated mediation effect of exhibitionism and narcissism. *Frontiers in Psychology*, *7*, 1279.

Martire, L. M., Stephens, M. A. P., & Townsend, A. L. (1998). Emotional support and well-being of midlife women: Role-specific mastery as a mediational mechanism. *Psychology and Aging*, *13*(3), 396–404.

McCanlies, E. C., Gu, J. K., Andrew, M. E., Burchfiel, C. M., & Violanti, J. M. (2017). Resilience mediates the relationship between social support and post-traumatic stress symptoms in police officers. *Journal of Emergency Management*, *15*(2), 107–116.

McKinnon, A., Meiser-Stedman, R., Watson, P., Dixon, C., Kassam-Adams, N., Ehlers, A., … Dalgleish, T. (2016). The latent structure of acute stress disorder symptoms in trauma-exposed children and adolescents. *Journal of Child Psychology and Psychiatry*, *57*(11), 1308–1316.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus statistical modeling software: Release 7.0*. Los Angeles, CA: Author.

National Health Commission of the People's Republic of China. (2020 March, 12). *The newest advance in COVID-19 epidemic until*. Retrieved from http://www.nhc.gov.cn/xcs/yqtb/202003/37c1536b6655473f8c2120ebdc475731.shtml

Ng, J. Y. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science*, *7*(4), 325–340.

Ryan, R. M., Bernstein, J. H., & Brown, K. W. (2010). Weekends, work, and well-being: Psychological need satisfactions and day of the week effects on mood, vitality, and physical symptoms. *Journal of Social and Clinical Psychology*, *29*(1), 95–122.

Ryan, R. M., & Deci, E. L. (2000). The darker and brighter sides of human existence: Basic psychological needs as a unifying concept. *Psychological Inquiry*, *11*(4), 319–338.

Ryan, R. M., Kuhl, J., & Deci, E. L. (1997). Nature and autonomy: An organizational view of social and neurobiological aspects of self-regulation in behavior and development. *Development & Psychopathology*, *9*(4), 701–728.

Saltzman, K. M., & Holahan, C. J. (2002). Social support, self-efficacy, and depressive symptoms: An integrative model. *Journal of Social & Clinical Psychology*, *21*(3), 309–322.

Sheldon, K. M., & Niemiec, C. P. (2006). It's not just the amount that counts: Balanced need satisfaction also affects well-being. *Journal of Personality & Social Psychology*, *91*(2), 331–341.

Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology*, *100*(4), 765–781.

Smith, B. N., Vaughn, R. A., Vogt, D., King, D. W., King, L. A., & Shipherd, J. C. (2013). Main and interactive effects of social support in predicting mental health symptoms in men and women following military stressor exposure. *Anxiety, Stress & Coping*, *26*(1), 52–69.

Stanley, I. H., Hom, M. A., Chu, C., Dougherty, S. P., Gallyer, A. J., Spencer-Thomas, S., … Joiner, T. E. (2019). Perceptions of belongingness and social support attenuate PTSD symptom severity among firefighters: A multistudy investigation. *Psychological Service*, *16*(4), 543–555.

Tao, J. H. (2006). Influence of acute psychological stress and exercise stress on the changes of immune function. *Chinese Journal of Clinical Rehabilitation*, *10*, 126–128.

Tian, L., Tian, Q., & Huebner, E. S. (2016). School-related social support and adolescents' school-related subjective well-being: The mediating role of basic psychological needs. *Social Indicators Research*, *128*, 105–129.

Zhen, R., Quan, L., & Zhou, X. (2018). How does social support relieve depression among flood victims? The contribution of feelings of safety, self-disclosure, and negative cognition. *Journal of Affective Disorders*, *229*, 186–192.

Zhou, X., Wu, X., Wang, W., & Tian, Y. (2018). The relation between repetitive trauma exposure and post-traumatic stress disorder: Understandingthe roles of feelings of safety and cognitive reappraisal. *Psychological Development & Education*, *34*, 90–97.

Zhou, X., Wu, X., Wang, W., & Tian, Y. (2019). Self-efficacy and self-esteem mediate the relation between social support and posttraumatic growth amongst adolescents following Wenchuan earthquake. *Psychological Development and Education*, *35*, 573–580.

Zhou, X., Wu, X., & Zhen, R. (2017). Understanding the relationship between social support and posttraumatic stress disorder/posttraumatic growth among adolescents after Ya'an earthquake: The role of emotion regulation. *Psychological Trauma: Theory, Research, Practice and Policy*, *9*(2), 214–221.