Systematic Review

A Systematic Review of the Effect of Social Support on Post-Traumatic Stress Disorder in Post-Earthquake Adolescents

Glorya Riana Latuperissa , Wiwi Rumaolat, Inta Susanti, Fathmy Fitriany Soulisa

Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Earthquakes can cause mental health disorders in adolescents, one of which is post-traumatic stress disorder (PTSD). The present study aimed to assess the effect of social support on post-traumatic stress disorder in adolescents after an earthquake.

Methods: The study was a systematic review with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) approach. Articles were searched for using the Scopus, ScienceDirect, ProQuest, EBSCO and SAGE databases before classifying them into 3 categories: prevalence, risk factors, social support, and post-traumatic stress disorder. The inclusion criteria regarding the literature were documents that were original; where the source was from a journal; where the article was written in English and where the full text was available. The age of the subjects in the articles was determined to be in the range of 10-20 years old. The publication time limit was 2015 to 2020. We identified 264 articles, of which 14 were considered to be relevant for this systematic review.

Results: Adolescents who experienced an earthquake were found to demonstrate a high prevalence of post-traumatic stress disorder with the proportion in girls being higher than boys. Showing social support has a significant effect on PTSD after an earthquake. The earthquake-related factors that were the most strongly associated with probable PTSD were feeling scared of dying and exposure to an earthquake.

Conclusion: Social support and the prevalence rates of PTSD should be observed in more detail. These results indicate that it is important to provide and strengthen the social support available to reduce the risk and severity of post-traumatic stress disorder after an earthquake among adolescents.

Cite this as: Latuperissa, G. R., Susanti, I., & Soulissa, F. F. (2020). A Systematic Review of the Effect of Social Support on Post-Traumatic Stress Disorder in Post-Earthquake Adolescents. *Jurnal Ners, Special Issues*, 135-141. doi:http://dx.doi.org/10.20473/jn.v15i2.18998

INTRODUCTION

Earthquakes can have a tremendous impact on all aspects of the lives of disaster victims, both physical and psychological. Earthquakes are among the most destructive and frequent natural experience emergency problems. They cause physical damage due to the earthquake itself but also mental health problems such as anxiety, stress (pressure), depression (moodiness) and trauma. The combined incidence of PTSD after earthquakes was reported to be 23.66% in a recent meta-analysis (Dai et al., 2016), indicating that earthquakes cause tremendous

psychological stress for the survivors (Liang, Cheng, Ruzek, & Liu, 2019).

Research has consistently demonstrated that post-traumatic stress disorder (PTSD) may be one of the most prevalent disorders (psychopathological problems) following a natural disaster (Zhou, Wu, Zhen, Wang, & Tian, 2018). Post-Traumatic Stress Disorder (PTSD) is a common psychiatric problem that is a result of an event or events that are so painful or stressful that they pose an exceptional threat to someone's life.

The individual may develop a variety of symptoms, including re-experiencing the aspects of the traumatic event, feelings of helplessness, intense fear, frightening dreams, or avoidance of the source of trauma (Marthoenis, Ilyas, Sofyan, & Schouler-Ocak, 2019).For example, followed 203 adolescent survivors at 6 and 12 months after the earthquake and reported the PTSD prevalence rates of 21.2% and 19.2%, respectively (Fan, Long, Zhou, Zheng, & Liu, 2015).

Social support has been shown to have the potential to reduce stress, depression and enhance health, thus it is understood to be a protective factor for individuals experiencing trauma (Evans, Steel, & DiLillo, 2013). In particular, the beneficial effects of social support can reduce the likelihood of developing post-traumatic stress disorder (PTSD) after exposure to traumatic events.

According to the cognitive model of PTSD (Ehlers & Clark, 2000), social support can influence the cognitive and emotional reactions in the aftermath of the trauma. For example, social support can facilitate the opportunity for the therapeutic reliving of the trauma by talking with their family and friends about it and receiving supportive feedback. This may reduce the negative views about the meaning of the trauma (Pinto et al., 2017).

Most researchers agree that the structural and functional aspects of social support are different phenomena and should be studied separately (Jia, Ying, Zhou, Wu, & Lin, 2015). Studies have identified the various magnitudes of the relationships between structural social support and PTG. These differences are to some extent based on the different support sources involved (e.g. family support, teacher support and peer support). Two meta-analysis studies also revealed that structural social support was the strongest predictor of PTSD, yielding effect sizes of. 40 and. 28 respectively (Jia et al., 2015).

In the past decade, many studies have focused on PTSD in the aftermath of earthquakes but few have examined the effects of social support on PTSD after the earthquake itself. The objective of this review was to systematically assess the effect of social support on post-traumatic stress disorder in post-earthquake adolescents. Below we have reviewed the body of research literature generated post-earthquake, focusing on prevalence, social support, post-traumatic stress disorder and the risk factors associated with probable PTSD.

MATERIALS AND METHODS

The literature search was performed using 5 databases: Scopus, ScienceDirect, ProQuest, EBSCO and SAGE. The articles were published from 2015 to 2020. There were no restrictions on the month and date otherwise. The search terms were developed following initial scoping searches of the literature. The final search terms were based on the key elements of the review: (1) "social support" AND (2) stress disorder post-traumatic AND (3) earthquake
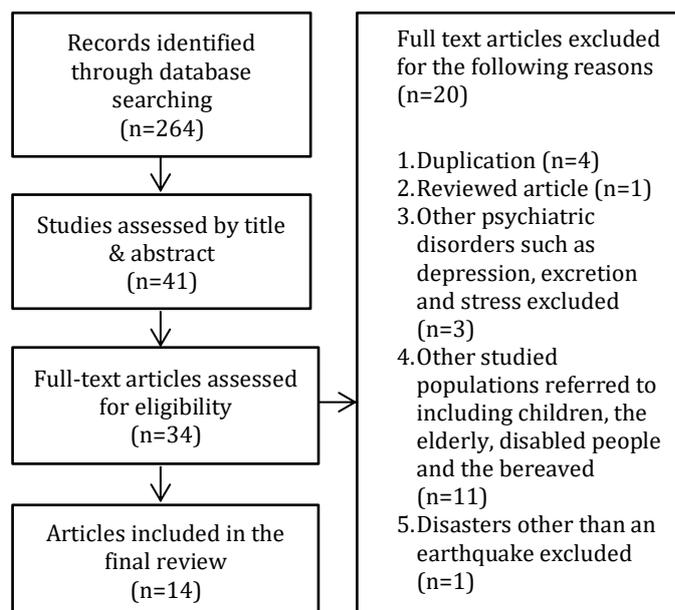

Figure 1. PRISMA Flow Diagram

AND (4) adolescent. The initial search generated a total of 1,481 articles.

We next limited the articles according to the topics that we wanted to discuss in this review. The abstracts of the identified articles, followed by the full text of the articles, were reviewed against the inclusion criteria where the population was aged 10-20 years (adolescents), it was a research article, the population had experienced or was experiencing post-traumatic stress disorder and they had experienced an earthquake. The exclusion criteria were duplication, a review article, referring to other psychiatric disorders such as depression, stress exclusion, mentioning other populations like children, the elderly, disabled people, the bereaved or focused on disasters other than earthquakes.

Studies that focused on other psychiatric disorders (e.g., depression, generalized anxiety disorder, stress) were excluded from this review. In addition, some studies were excluded that focused on special populations such as the elderly, children, the disabled or a person who had lost their family (bereaved).

RESULTS

Literature Search Result

Figure 1 provides an overview of the study selection process. Based on the key word searches, 246 titles were retrieved. Screening was conducted and there were 41 publications from 5 databases (Scopus, Science Direct, ProQuest, EBSCO and SAGE) classified as relevant. These were assessed according to their title and abstract before then being rescreened once the full-text version was obtained. Following this, 34 studies were then checked against the inclusion and exclusion criteria. In total, 14 studies met the predefined inclusion criteria and were thus included for further analysis.

Table 1. Design, measures and outcomes

Author/Year	Design	Population	Instrument(s)	Outcome
(Xu, Wang, & Tang, 2018)	Cross-sectional	3.851 respondents	The questionnaire had two parts. The first elicited information about their basic demographic data: age, gender, hometown, school and grades. The second part was the Earthquake Experience Scale, the Adolescent Self- Rating Life Events Checklist (Chinese-language version) and the Children's Revised Impact of Event Scale (CRIES-13).	The probable PTSD prevalence was 14.1% among all of the respondents (n = 3851). It was 15.9% among those who had been exposed to the 2008 and 2013 earthquakes (n = 2342) and it was 11.3% among those who had experienced only the 2013 earthquake (n = 1509).
(Zhou, Wu, & Zhen, 2017)	Longitudinal	397 respondents	Trauma exposure questionnaire, Social support questionnaire, Self-esteem Scale, State Hope Scale (SHS), Post-Traumatic Growth Inventory (PTGI) and the PTSD checklist for DSM-5.	Social support directly and negatively predicted PTSD and positively predicted PTG. Moreover, social support negatively predicted PTSD via self-esteem and positively predicted PTG via hope.
(S. Liu et al., 2019)	Cross-sectional	1.976 respondents	Questionnaire on the socio-demographic characteristics, the School Adaptation Scale (ASAS) and the PTSD Checklist.	A total of 30.7% of Tibetan adolescents had poor school adaptation and 19.5% were estimated as having probable PTSD.
(B. Du et al., 2018)	Cross-sectional	4.118 respondents	Questionnaire on demographic information, questionnaire on seismic exposure, the PTSD Checklist-Civilian Version (PCL-C) questionnaire, the Post-traumatic Growth Inventory (PTGI), the Perceived Social Support Scale (PSSS) and a Simple Coping Style Questionnaire (SCSQ).	The rate of PTSD is 1.9% in the generally affected area and 2.7% in the severely affected disaster area. There is no significant difference between the two differently affected areas.
(D. Liu, Fu, Jing, & Chen, 2016)	Bivariate logistic regression analysis	4.072 respondents	PTSD Checklist-Civilian version, The Internality, Powerful Others, the Chance Scale and The Coping Style Scale	The prevalence rate of probable PTSD was 17.8%. The predicting factors for PTSD were found to be aged 14 or older, being a senior student, being monitored, being buried/injured, having a family member who had died or had a limb amputated, severe property loss, had witnessed death, had negative coping skills, and had power over another's locus of control.
(Marthoenis et al., 2019)	Cross-sectional	321 respondents	The Patient Health Questionnaire (PHQ), the Generalized Anxiety Disorder (GAD-7) questionnaire and the Disaster Impact Questionnaire (DIQ)	Approximately 58.3%, 16.8% and 32.1% of adolescents reported the clinical symptoms of PTSD, depression and anxiety, respectively. The associations and comorbidity between PTSD, depression and anxiety were found to be statistically significant (p=0.001).
(Fan et al., 2015)	Multivariate logistic regression	1.573 respondents	Post-traumatic Stress Disorder Self-Rating Scale (PTSD-SS), the Adolescent Self-Rating Life Events Checklist, the Social Support Rate Scale and the Simplified Coping Style Questionnaire.	The PTSD prevalence rates at 6, 12, 18 and 24 months were 21.0, 23.3, 13.5 and 14.7%, respectively. Five PTSD symptom trajectories were observed: resistance (65.3% of the sample), recovery (20.0%), relapsing/remitting (3.3%), delayed dysfunction (4.2%) and chronic dysfunction (7.2%)

(Zhou et al., 2018)	Little's Missing Complete at Random test	391 respondents	Trauma exposure questionnaire and the 17-item Child PTSD Symptom Scale (CPSS).	Three latent PTSD trajectories were found in adolescents: moderate-stable (81.6%), decreasing (8.7%) and increasing trajectories (9.7%).
(N. Du, Zhou, SiTu, Zhu, & Huang, 2019)	ANOVA	330 respondents	Demographic questionnaire, Children's Revised Impact of Event Scale (CRIES) and the Depression Self-Rating Scale for Children (DSRSC).	The prevalence of probable PTSD in different stages was 42.2%, 20.1%, 30.3% and 11.2%. The sub-symptoms of PTSD of intrusion and arousal tended to decrease after the 1st year, followed by a rebound in the 2nd year before dropping again in the 3rd year.
(Li et al., 2019)	ANOVA	13.438 respondents	UCLA PTSD Reaction Index for Children and the Self-Report Dysexecutive Questionnaire.	A 4-class parallel model was found to best describe the latent PTSD symptom profiles and executive dysfunction. Individuals in the higher symptom groups showed more trauma exposure and a lower quality of life.
(Ge, Li, Yuan, Zhang, & Zhang, 2020)	A machine learning approach (XGBoost) and cross-validation	2.099 respondents	Socio-demographic information and earthquake-related experience, self-constructed sleep questionnaire, self-constructed emotional state questionnaire, self-constructed questionnaire, self-constructed everyday functioning questionnaire and the Children's Revised Impact of Event Scale (CRIES).	Any combination type predicted young survivors with probable PTSD with the prediction accuracies ranging between 66% -80% ($p < 0.05$). In particular, the combination of earthquake experience, everyday functioning, somatic symptoms and sleeping correctly was predicted in 683 out of 802 cases of probable PTSD, translating to a classical accuracy of 74.476% (85.156% sensitivity and 60.366% specificity). This is an area under the curve of 0.80. The most relevant variables (e.g. age, sex, property loss and a sedentary lifestyle) were revealed in the present study.
(Eray, Uçar, & Murat, 2017)	ANOVA	434 respondents	The Child Post-traumatic Stress Disorder (PTSD) - Reaction index, the Brief Symptom Inventory (BSI) and the Perceived Social Support Scale - Revised.	There was a significant difference in the PTSD scores between the earthquake and control groups. There was also a significant difference in the BSI scores between the groups. The participants who had witnessed the death or injury of a family member or friend had significantly higher PTSD scores than the others.
(Cheng, Liang, Zhou, Eli, & Liu, 2019)	Longitudinal	304 respondents	The Acute Stress Disorder Scale (ASDS) and the Post-traumatic Stress Disorder Reaction Index for DSM-IV (UCLA PTSD-RI)	Four trajectories of PTSD symptoms were found, namely resilience (53.8%), low symptoms (32.6%), recovery (7.0%) and chronic dysfunction (6.6%).
(Zhou, Wu, & Zhen, 2016)	Descriptive analyses and correlations	315 respondents	Trauma exposure, social support and emotional regulation, as well as the Child PTSD Symptom Scale and the Post-traumatic Growth Inventory.	Social support had a significant direct association with PTG but not with PTSD. Social support had a negative indirect prediction related to PTSD and a positive indirect prediction related to PTG through cognitive reappraisal.

General Characteristics

Table 1 presents an overview of all of the included studies and the extracted main data. The earliest article was published in March 2015 and the latest in November 2019. This systematic review obtained 14 selected articles from China, Turkey and Indonesia. The sample size ranged from n=304 to n= 13,438. All of the selected studies provided data indicating that

the participants were aged 10 to 20 years old. The study periods varied from 1 year to 8 years.

The review results show that social support has a significant effect on PTSD after an earthquake. The assessment of whether there was an increase in PTSD included 1) age, 2) sex, 3) property loss and 4) a sedentary lifestyle. Table 2 shows that the most common design used in the studies assessed was cross-sectional, in addition to ANOVA, longitudinal and others. The most commonly used measurement instrument was a questionnaire.

Prevalence has been defined as the percentage of old and new cases of a disease in the general population at a given time. Incidence has been defined as the frequency of new cases of a disease in a certain range of people within a certain period of time (Liang et al., 2019). Three months after the earthquake in Lushan, the prevalence rate of probable PTSD was 38.2% among children and adolescents. Eight years after the Wenchuan earthquake, the PTSD rate was 1.9% in the generally affected area and 2.7% in the severely affected disaster area. Two and a half years after the earthquake in Ya'an, social support was a significant negative predictor of PTSD but a positive predictor of post-traumatic growth (PTG). There was a significant and positive association between PTSD and post-traumatic growth, and it was also found that the proportion of girls with PTSD was significantly higher than the proportion of boys.

The risk factors associated with probable PTSD are descriptive such as the feeling that the individual is going to die, being trapped during the earthquake, being injured in the earthquake, having parents or relatives who were injured, witnessing someone being trapped, witnessing someone become injured, having a relative who died, witnessing death, having a destroyed house and losing property

DISCUSSION

In general, there are a small number of studies providing evidence on how social support has an effect on post-traumatic stress disorder in adolescents. Natural disasters, such as earthquakes, cause mental disorders and affect a large number of people in the world. The 2015 Barpak earthquake in Nepal was a cataclysmic disaster and it had a heart-rending impact on many survivors. Nine months after the disaster, the affected peoples are yet to recover (Dahal, Kumar, & Thapa, 2018). However, previous research still shows the rate of PTSD as only 1.9% in the generally affected area and 2.7% in the severely affected disaster area 8 years after the earthquake (B. Du et al., 2018). In this study, the review shows that the prevalence of PTSD is still high even though several years have passed.

The prevalence rate of probable PTSD among young survivors at 3 months following the Lushan earthquake was 38.2%, indicating that probable PTSD symptoms are common among children and adolescents following an earthquake exposure. A study summarized 12 cross-sectional studies and

found that the prevalence rates for PTSD in children and adolescents who experienced an earthquake ranged between 4.5 - 95%. Additionally, the findings indicated that after controlling for age and gender, the trauma exposure differentiated between the significantly distinct PTSD trajectories.

In this systematic review, our study found females have a greater risk of probable PTSD. This is consistent across several studies. In fact, females are more likely than males to develop PTSD after trauma exposure. Many factors may explain this gender bias, such as the differences in terms of physical structure, social status, family role and problem solving and fantasy-coping styles.

Exposure to traumatic disaster-related experiences is one of the most important factors in the development of psychiatric symptoms. Consistent with this, we found that each earthquake-related exposure led to a higher probable PTSD risk and with each previous exposure, the prior trauma events are important contributors to the increased PTSD risk. Subjective fear and self-perceived exposure to trauma contribute to PTSD prevalence, even in earthquakes of a relatively low magnitude. Experiencing the death of relatives, lost property, and being injured or trapped in the earthquake were the risk factors for probable PTSD.

Some studies also discuss social support in relation to predicting Post-Traumatic Stress Disorder (PTSD) and Post-Traumatic Growth (PTG). Here, support positively predicts PTG but negatively predicts PTSD. These results also support the main effect and hypothesis of social support and indicate that social support can play a positive role in mental health among adolescents, regardless of the amount of stress that an individual has experienced. Social support tends to result in the experience of feeling accepted and belonging. This can promote a positive appraisal of the self and ultimately help to reduce the severity of PTSD.

Social support is the content of relationships that can be categorized into four types of protection or supportive action, namely emotional support (empathy support, love, trust, and attention), instrumental assistance, information support which is the provision of suggestions and information that can be used by someone to overcome problems and suggestions that are useful for self-evaluation. In other words, constructive feedback and affirmation.

A previous study suggested that perceived high social support can increase the adolescents' feelings of safety and belonging. This can help the adolescents to share their traumatic experiences freely with their supporters which can increase the probability of a cognitive reappraisal of the trauma and emotion. Social support could also indirectly lessen the severity of the PTSD through decreasing expressive suppression. In a setting with high social support, people are more likely to expose their emotions to others and vent negative feelings. In turn, the probability of expressive suppression is reduced (Zhou et al., 2016).

Clinical efforts should focus on the improvement of social support. For example, school psychologists or parents can provide emotional and material support for the adolescents and work to foster a supportive environment. Additionally, helping the adolescents to build their self-esteem and encouraging them to form more positive attitude towards the traumatic event as well as their post-traumatic emotions may mitigate the negative effects after trauma. It can also contribute to positive traumatic growth.

CONCLUSION

This systematic review has identified the research on social support for post-traumatic stress disorder and found that it is still limited. There is not yet enough information on how social support affects PTSD in adolescents. This must be observed in more detail. The decline in the rate of PTSD prevalence was rapid soon after the earthquake but it slowed down as time passed. This observation indicates that most of the victims suffering from PTSD gradually recover during the early stages while the remaining victims take longer and might have more difficulty recovering from PTSD. These studies enrich the understanding of the risk factors of PTSD in various countries that have experienced earthquakes and it can provide useful knowledge related to identifying the risk factors for PTSD in adolescents.

CONFLICT OF INTEREST

No Conflicts of interest have been declared.

ACKNOWLEDGEMENT

REFERENCES

Cheng, J., Liang, Y. M., Zhou, Y. Y., Eli, B., & Liu, Z. K. (2019). Trajectories of PTSD symptoms among children who survived the Lushan earthquake: A four-year longitudinal study. *Journal of Affective Disorders*, *252*(March), 421–427. https://doi.org/10.1016/j.jad.2019.04.047

Dahal, H. R., Kumar, S., & Thapa, D. K. (2018). Prevalence and risk factors of post-traumatic stress disorders among the survivors of 2015 Nepal earthquake, in Dhading, Nepal. *Sleep and Hypnosis*, *20*(2), 128–139. https://doi.org/10.5350/Sleep.Hypn.2017.19.01 45

Du, B., Ma, X., Ou, X., Jin, Y., Ren, P., & Li, J. (2018). The prevalence of posttraumatic stress in adolescents eight years after the Wenchuan earthquake. *Psychiatry Research*, *262*, 262–269. https://doi.org/10.1016/j.psychres.2018.02.019

Du, N., Zhou, P., SiTu, M. jing, Zhu, C. zhen, & Huang, Y. (2019). Post-traumatic stress disorder and depression symptoms of adolescents survived from a seriously-hit area in China: A 3-year follow-up study. *Psychiatry Research*, *273*(January), 288–295. https://doi.org/10.1016/j.psychres.2019.01.063

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/S0005-7967(99)00123-0

Eray, Ş., Uçar, H. N., & Murat, D. (2017). The effects of relocation and social support on long-term outcomes of adolescents following a major earthquake: A controlled study from Turkey. *International Journal of Disaster Risk Reduction*, *24*(June), 46–51. https://doi.org/10.1016/j.ijdrr.2017.05.026

Evans, S. E., Steel, A. L., & DiLillo, D. (2013). Child maltreatment severity and adult trauma symptoms: Does perceived social support play a buffering role? *Child Abuse and Neglect*, *37*(11), 934–943. https://doi.org/10.1016/j.chiabu.2013.03.005

Fan, F., Long, K., Zhou, Y., Zheng, Y., & Liu, X. (2015). Longitudinal trajectories of post-traumatic stress disorder symptoms among adolescents after the Wenchuan earthquake in China. *Psychological Medicine*, *45*(13), 2885–2896. https://doi.org/10.1017/S0033291715000884

Ge, F., Li, Y., Yuan, M., Zhang, J., & Zhang, W. (2020). Identifying predictors of probable posttraumatic stress disorder in children and adolescents with earthquake exposure: A longitudinal study using a machine learning approach. *Journal of Affective Disorders*, *264*(January 2019), 483–493. https://doi.org/10.1016/j.jad.2019.11.079

Jia, X., Ying, L., Zhou, X., Wu, X., & Lin, C. (2015). The effects of extraversion, social support on the posttraumatic stress disorder and posttraumatic growth of adolescent survivors of the Wenchuan earthquake. *PLoS ONE*, *10*(3), 1–13. https://doi.org/10.1371/journal.pone.0121480

Li, G., Wang, L., Cao, C., Fang, R., Cao, X., Chen, C., … Hall, B. J. (2019). Posttraumatic Stress Disorder and executive dysfunction among children and adolescents: A Latent Profile Analysis. *International Journal of Clinical and Health Psychology*, *19*(3), 228–236. https://doi.org/10.1016/j.ijchp.2019.07.001

Liang, Y., Cheng, J., Ruzek, J. I., & Liu, Z. (2019). Posttraumatic stress disorder following the 2008 Wenchuan earthquake: A 10-year systematic review among highly exposed populations in China. *Journal of Affective Disorders*, *243*(August 2018), 327–339. https://doi.org/10.1016/j.jad.2018.09.047

Liu, D., Fu, L., Jing, Z., & Chen, C. (2016). Post-Traumatic Stress Disorder and It's Predictors Among Tibetan Adolescents 3 Years After the High-Altitude Earthquake in China. *Archives of*

Psychiatric Nursing, *30*(5), 593–599. https://doi.org/10.1016/j.apnu.2016.01.005

Liu, S., Lu, L., Bai, Z. Z., Su, M., Qi, Z. Q., Zhang, S. Y., … Lii, K. (2019). Post-traumatic stress and school adaptation in adolescent survivors five years after the 2010 Yushu earthquake in China. *International Journal of Environmental Research and Public Health*, *16*(21), 1–11. https://doi.org/10.3390/ijerph16214167

Marthoenis, M., Ilyas, A., Sofyan, H., & Schouler-Ocak, M. (2019). Prevalence, comorbidity and predictors of post-traumatic stress disorder, depression, and anxiety in adolescents following an earthquake. *Asian Journal of Psychiatry*, *43*(May), 154–159. https://doi.org/10.1016/j.ajp.2019.05.030

Pinto, R. J., Morgado, D., Reis, S., Monteiro, R., Levendosky, A., & Jongenelen, I. (2017). When social support is not enough: Trauma and PTSD symptoms in a risk-sample of adolescents. *Child Abuse and Neglect*, *72*(February), 110–119. https://doi.org/10.1016/j.chiabu.2017.07.017

Xu, J., Wang, Y., & Tang, W. (2018). Posttraumatic stress disorder in Longmenshan adolescents at three years after the 2013 Lushan earthquake. *General Hospital Psychiatry*, *54*(24), 45–51. https://doi.org/10.1016/j.genhosppsych.2018.05.009

Zhou, X., Wu, X., & Zhen, R. (2016). Understanding the Relationship Between Social Support and Posttraumatic Stress Disorder / Posttraumatic Growth Among Adolescents Afte. *Psychological Trauma: Theory, Research, Practice, and Policy*, *16*.

Zhou, X., Wu, X., & Zhen, R. (2017). Self-esteem and hope mediate the relations between social support and post-traumatic stress disorder and growth in adolescents following the Ya'an earthquake. *Anxiety, Stress and Coping*, *31*(1), 32–45. https://doi.org/10.1080/10615806.2017.1374376

Zhou, X., Wu, X., Zhen, R., Wang, W., & Tian, Y. (2018). Trajectories of posttraumatic stress disorders among adolescents in the area worst-hit by the Wenchuan earthquake. *Journal of Affective Disorders*, *235*(March), 303–307. https://doi.org/10.1016/j.jad.2018.04.032