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ANALITIKA

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Posttraumatic Growth: Peran *Trauma Exposure* dan *Family Hardiness* Pada Penyintas Likuifaksi Pasigala

Posttraumatic Growth: *The Role of Trauma Exposure and Family Hardiness Against Pasigala Liquefaction Survivors*

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Abstrak

Bencana alam yang terjadi di PASIGALA pada tahun 2018 silam meninggalkan dampak yang signifikan bagi penyintas likuifaksi. Penelitian mengenai pemulihan setelah bencana salah satunya berfokus pada pencapaian positif yang dialami penyintas. Penelitian ini bertujuan untuk mengetahui peran dari *trauma exposure* dan *family hardiness* dalam mengembangkan *posttraumatic growth* (PTG). Partisipan dalam penelitian ini adalah 147 orang penyintas dewasa (M_{usia} = 23.06, SD = 4.12) yang tersebar di Kota Palu dan Kabupaten Sigi, Sulawesi Tengah. *PTG* diukur dengan *Posttraumatic Growth Inventory Short-Form* (PTGI-SF), *trauma exposure* diukur dengan modifikasi dari *Earthquake Exposure Questionnaire* dan *Impact of Event Scale*, dan *family hardiness* diukur dengan *Family Hardiness Index* (FHI). Uji regresi bertingkat menemukan bahwa *trauma exposure* dan *family hardiness* secara signifikan memprediksi sebesar 7% dan 17.2% variasi *posttraumatic growth* ketika variabel lain dikontrol. Kemudian, uji mediasi menunjukkan bahwa *family hardiness* secara signifikan berperan sebagian atau parsial sebagai mediator antara *trauma exposure* terhadap PTG. Semakin banyak *trauma exposure* yang dialami individu ketika bencana alam terjadi, dengan adanya tingkat *family hardiness* yang semakin tinggi, individu akan mencapai kondisi PTG yang lebih tinggi ($c = 0.759$, $p < 0.01$) dibandingkan jika hanya mempertimbangkan peran *trauma exposure* ($c' = 0.301$, $p < 0.01$). Hal ini menunjukkan bahwa *family hardiness* merupakan faktor penting yang perlu dipertimbangkan ketika membantu penyintas bencana likuifaksi yang terekspos pada kejadian traumatik dalam mengembangkan *posttraumatic growth*.
Kata Kunci: *Posttraumatic Growth*; Trauma; *Family Hardiness*; Likuifaksi.

Abstract

The natural disaster occurred in PASIGALA in 2018 left a significant impact on the survivors of liquefaction. Research on recovery after a disaster focuses on the positive outcomes by survivors. This study aims to determine the role of trauma exposure and family hardiness in developing posttraumatic growth (PTG). Participants in this study were 147 adult survivors (Musia = 23.06, SD = 4.12) spread across Palu City and Sigi Regency, Central Sulawesi. PTG was measured by Posttraumatic Growth Inventory Short-Form (PTGI-SF), trauma exposure was measured by modification of the Earthquake Exposure Questionnaire and Impact of Event Scale, and family hardiness was measured by Family Hardiness Index (FHI). The hierarchical regression test found that trauma exposure and family hardiness significantly predicted 7% and 17.2% of posttraumatic growth variances when other variables were controlled. Then, the mediation test showed that family hardiness had a significant or partial role as a mediator between trauma exposure and PTG. The more trauma exposures experienced by individuals when natural disasters occurred, with a higher level of family hardiness, individuals would achieve a higher PTG condition ($c = 0.759$, $p < 0.01$) than if only considering the role of trauma exposure ($c' = 0.301$, $p < 0.01$). This shows that family hardiness is an important factor to consider when assisting liquefaction disaster survivors who are exposed to traumatic events in developing posttraumatic growth.
***Keywords**: Posttraumatic Growth; Trauma; Family Hardiness; Liquefaction.*

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INTRODUCTION

Indonesia is one of the countries that is vulnerable to natural disasters, such as earthquakes. There are earthquakes that cause landslides, tsunamis, or even liquefaction. Natural disasters have their own impact on human life, both physically on the environment and humans and psychologically on the affected individuals. This also happened in the natural disaster of the earthquake in Central Sulawesi, which is often called PASIGALA or stands for the area that is the center of the incident, namely Palu, Sigi, Donggala, in 2018 ago.

Liquefaction is one of the natural events that occurs as a result of earthquakes that cause the soil layer on the surface to lose its density and strength so that the soil looks soft and unstable (J, 2000). The main impacts of damage caused by liquefaction in PASIGALA are the loss of land where farming and gardening, as well as the destruction and loss of community housing (Tondi, 2019). The impact of such damage on individuals is to give rise to traumatic experiences, loss of jobs and sources of income, food crisis, and loss of residential land which is the biggest impact of liquefaction. Therefore, survivors are required to adjust and adapt well in order to live a life again (recover) from the crisis. However, the individual not only seeks to recover, but can also exceed his condition and abilities compared to before the cataclysm occurred. This is due to the occurrence of a cognitive transformation that initiates a process of rebuilding and new understanding in survivors as a result of a change or shift (shifting) of reality or the world (Tedeschi & Calhoun, 2004b). This is called posttraumatic growth or often abbreviated as PTG.

Posttraumatic growth in individuals can be seen through five domains, namely personal strength, new opportunities, spirituality, relation to others, and appreciation of life (Tedeschi & Calhoun, 2004). These five domains do not have to exist together at one time in an individual. This is because a person can experience positive growth in the domain of his spirituality related to the relationship with God, but in other domains it does not show positive growth. Posttraumatic growth (or often abbreviated as PTG) itself is the outcome of a traumatic event experienced by a person, but the condition achieved is not permanent and has a tendency to change as the situation changes (Calhoun & Tedeschi, 2006). Therefore, the main focus of posttraumatic growth is the presence of any positive growth from these five domains that indicates that the individual experiences a positive development despite experiencing events that have a traumatic effect. This growth occurs related to cognitive transformations that encourage individuals to change their mindset from the negative situation experienced so that they can discover something new that is positive (Tedeschi & Calhoun, 2004).

The factors that play a role in achieving PTG can be seen from two factors, namely internally and externally. Internally, previous research related to posttraumatic growth in Sunda Strait tsunami survivors in Indonesia showed that individuals who are able to achieve high PTG conditions are closely related to religiosity or in this case are beliefs in religion and practice (Rahmasari, 2019). Other studies have also shown that in addition to spirituality, coping strategies and optimistic individual characters are closely related to even predicting the occurrence of PTG (Ramos & Leal, 2013). In addition to individual

internal factors, external factors are also inseparable in relation to posttraumatic growth. Research in several natural disasters outside Indonesia found a predictor role of family characteristics, such as having good family function and larger or more numerous family sizes (Augustine, 2014) and exposure to intense traumatic events (in this case large earthquakes and liquefaction that occur in a row) (Fergusson et al., 2014; Kvestad et al., 2019). Therefore, research taking into account the role of survivors' experiences exposed to traumatic events and family factors to posttraumatic growth also needs to be carried out on earthquake survivors in PASIGALA, due to the occurrence of two natural disasters in close proximity, namely liquefaction caused by earthquakes.

Trauma exposure or exposure to intense trauma events experienced by survivors can lead to negative and/or positive outcomes. Exposure when natural disasters occur that can trigger trauma to survivors such as large-scale earthquakes, collapsed buildings, physical injuries, and the presence of family members who died (Kvestad et al., 2019). The study also mentioned that the more the list of traumatic events a survivor experiences, the higher the likelihood of experiencing post-traumatic stress disorder. The Pasigala liquefaction disaster triggered by a large-magnitude earthquake is thought to cause higher risk factors and trauma for survivors than if it were just an earthquake. This is because in addition to buildings damaged and destroyed by vibration, the movement of soil by liquefaction causes people and various materials on the ground to be trapped and submerged in the ground suddenly (J, 2000). However, on the other hand, liquefaction survivors can also experience positive outcomes such as PTG (Smith et al., 2016). Therefore, focusing on the positive outcomes of negative events such as liquefaction disasters is interesting to study further.

This research also focuses on external factors supporting the achievement of PTG, family hardiness, because Central Sulawesi itself, especially in Palu City and its surroundings (Donggala Regency and Sigi Regency) or PASIGALA, has local wisdom or cultural values that strongly emphasize the importance of togetherness between fellow humans (Ahdiah & Amir, 2019). The dominating tribe is the Kaili tribe (the indigenous tribe of Central Sulawesi) along with a mixture of various tribes in Sulawesi (such as the Bugis-Kaili). This is due to the large number of migrants living in Central Sulawesi so that there is a mixing of cultures from various tribes and ethnicities. Togetherness and cooperation are considered as forms of solidarity (kinship, brotherhood, and kinship) and "equality of taste" that fuse the differences between natives and migrants by referring to themselves as "Palu People". This is what gives rise to the suspicion that external factors, namely the family, play an important role in the growth process of posttraumatic growth of liquefaction survivors in PASIGALA.

One of the family roles that will be observed is the positive characteristic that the family has, namely family hardiness. In addition, research related to family hardiness in natural disaster survivors in Indonesia that prioritizes togetherness or group harmony (such as family) over individual interests is also important to do to see the role of collective cultural backgrounds (Hofstede et al., 2010).

Family hardiness itself is a characteristic of families that show resilience so that they can adapt well in crisis situations characterized by good control, commitment to fellow family members, and being able to survive in changing or challenging situations (McCubbin et al., 1986). Family hardiness itself is a central part of the Resilience Model (McCubbin & McCubbin, 1996). That is, family hardiness has an important role in predicting whether a family can be called resilient or not. In fact, previous studies have considered that family hardiness represents a person's family resilience because of its central role in shaping family resilience (García-Cadena et al., 2014).

Family hardiness is known to be one of the protective factors that are closely correlated negatively with the presence of distress or illness. Family hardiness can act as a mediator or moderator on the distress-illness model. This is the basis for the alleged positive role of family hardiness in the achievement of a person's posttraumatic growth condition. This is because growth is also an important aspect to help survivors achieve well-being or flourished conditions (Calhoun & Tedeschi, 2006). In addition, researchers and experts in positive psychology expect that research related to posttraumatic growth will continue to be carried out to obtain adaptation and growth models that can provide practical input on the development of the well-being of individuals who experience traumatic events by looking at aspects of positive development, not just the possibility of mental health disorders. Therefore, knowing the role of the family as one of the smallest and closest groups in society really needs to be explored more deeply in a society that holds a majority of collective cultures whose reconstruction process after the disaster focuses on the group rather than the personal (Hofstede et al., 2010).

Previously, several studies have tried to analyze the relationship between family resilience, in general, and posttraumatic growth. Family resilience and family hardiness itself are closely related, because family hardiness is often considered the main aspect that forms a resilient family characterized by positive characteristics, namely the family's ability to face a crisis condition (Herdiana et al., 2018). Penelitian previously also focused more on the process of family function (Augustine, 2014) to the emergence of PTG in earthquake survivors, who experienced different exposure to liquefaction survivors in Pasigala. Then, compared to the family function process, the characteristics of families with good family hardiness are one of the important factors that support the occurrence of a positive result from an event that causes stress (McCubbin & McCubbin, 1996), namely PTG. However, research looking at specific family hardiness along with trauma exposure to the emergence of PTG is still limited, especially in liquefaction survivors.

Therefore, based on the explanation above, it is suspected that the characteristics of families with intense traumatic exposure (primary survivor) along with good family hardiness will play a positive role in developing PTG in liquefaction survivors and that family hardiness can actually also act as an intermediary for survivors to be able to achieve a better level of PTG. The hypothesisproposed in this study is 1) trauma exposure and family hardiness predict posttraumatic growth when demographic variables are controlled and 2) family hardiness acts as a mediator on the relationship between

trauma exposure and posttraumatic growth in liquefaction survivors who are in early adulthood in Pasigala.

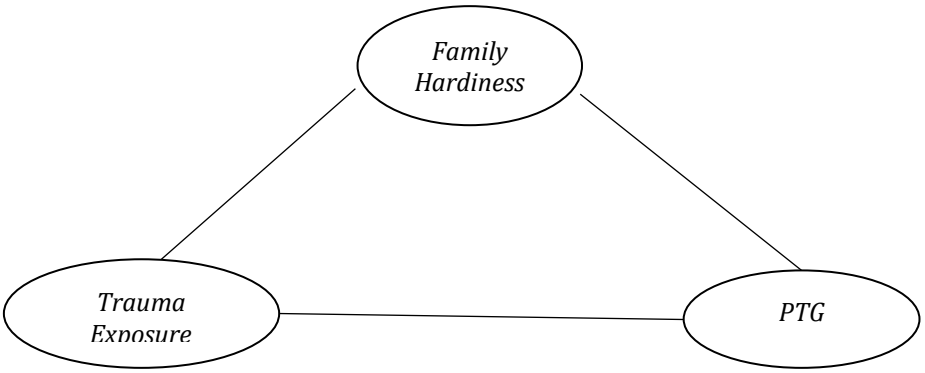

Figure 1. Mediating effects by family hardiness
on trauma exposure relationships with various domains of posttraumatic growth.

RESEARCH METHOD

This study uses a quantitative approach with a cross-sectional research design because individuals who have different age stages are studied at the same time (who in this study are in early adulthood) (Cozby & Bates, 2018). Questionnaires are given to participants and filled out directly. This study is a correlational study because it aims to determine the relationship or relationship between the variables of trauma exposure, family hardiness, and PTG.

Participants in this study were individuals aged 17–35 years, who were victims (directly / primary) of liquefaction natural disasters in Central Sulawesi in 2018, had no history of psychological disorders (based on professional diagnosis) related to traumatic events of natural disasters, and were not deaf, deaf, or visually impaired. Sampling is carried out using a convenience sampling technique (non-probability sampling) where the individual who is a participant is based on the availability or willingness of prospective participants who are targeted based on the characteristics of the participants (Cozby & Bates, 2018). This is because the context of the study is specific and difficult to do random sampling. Regarding the number of target samples needed, calculations based on Tabachnick et al., (2019), the sample size required is $N \geq 66$. This research has passed the ethics review from the ethics commission of the Faculty of Psychology, University of Indonesia with number 721/FPsi.Ethics Committee/ PDP.04.00/2020.

In this study, adaptation and trial of all measuring instruments or instruments used for 88 natural disaster survivors in PASIGALA aged 17-35 years, online. The first measuring instrument used was the Posttraumatic Growth Inventory-Short Form (Cann et al., 2010), which is a shortened version of the Posttraumatic Growth Inventory (PTGI), used to measure posttraumatic growth, or the growth outcomes experienced by individuals after experiencing a negative event. The overall growth experienced by individuals is observed based on three major domains, namely related to self-perception (personal strength and finding new opportunities), social relations, and philosophy of

life (spirituality and appreciation of life) which in total consists of 10 items. The translation Indonesian of this measuring instrument was modified from Shafira (2011) based on the advice of researchers who developed PTGI-SF. The results of the try-out on 88 survivors of natural disasters carried out by researchers on this measuring instrument had good internal consistency, namely Cronbach α = 0.884.

The scale used is a 6-point likert with a range of 0-5 (does not experience growth until it experiences very much growth). The higher the score obtained, the higher or more positive growth experienced will be, and vice versa. In this study, the PTGI-SF instrument was analyzed unidimensionally as in the previous study (Cann et al., 2010). The second measuring instrument is the Family Hardiness Index, developed by (McCubbin et al., 1986) based on the concept of individual hardiness, to measure the level of family hardiness. Family hardiness is the capacity that families have to survive in crisis situations and adapt well. The scale used is a 4-point likert with a range of 0 – 3 (wrong or not experienced in the family to true or experienced in the family). This measuring instrument was adapted by researchers with a fairly good overall reliability, namely Cronbach α = 0.813. The adaptation results show that the item r is above the value of 0.3, so the entire item is used without revision.

Finally, for trauma exposure measuring instruments, the scale was adapted and modified from previous studies (Fergusson et al., 2014; Kvestad et al., 2019) adapted to the context of earthquake and liquefaction natural disasters. This scale measures the variety of exposures to events a person experiences when a natural disaster occurs. The more variety of exposures experienced, the higher the trauma exposure score and the range of 1 – 5 (1 = no impact to 5 = very impactful) for the degree of magnitude of the impact felt by participants from each event experienced (e.g., strong vibrations, seeing the ground move, homelessness, and life threatened). This scale has good reliability with a Cronbach value of α = 0.826. After all data were collected, the analysis was carried out using JASP 0.12.0 (JASP team, 2020) and PROCESS Hayes (Hayes, 2018). Preliminary analysis and multiple regression analysis are carried out first, then mediation analysis is carried out using PROCESS Hayes.

RESULTS AND DISCUSSION

Participants in this study were 147 liquefaction survivors (M_{age} = 23. 06, SD = 4. 12) the majority of whom are women (64. 6%), unmarried (81%), from Kaili cultural background (45. 6%), not working (68%), and a small percentage experiencing loss of family members when liquefaction occurs / bereavement (18. 4%). Bereavement or loss of family members due to natural disasters is included as demographic data because it is one of the factors known to be closely related to a person's PTG growth. In addition, the majority of participants were exposed to traumatic events as many as 10 out of 14 types of events (e.g., seeing liquefaction, life threatened, residential buildings collapsing, and being separated from family). The intensity of the impact of these different types of events also averaged four (4) for each type of event which means that participants think each event they experienced had a major impact on their lives.

Table 1. Participant demographics (N = 147)

Variabel	Classification	n	(%)
Gender	Men	52	35,4
	Woman	95	64,6
Status	Unmarried	119	81
	Married	28	19
Education	Secondary School	104	70,7
	Higher Education	43	29,3
Tribe	Kaili	67	45,6
	Other	80	54,4
Employment Status	Working	47	32
	Not Working	100	68
Bereavement	Exist	27	18,4
	None	120	81,6

Before performing a regression test, several assumption tests are first performed to see if a regression test can be performed. The assumptions tested were the correlation between the variables tested, colinearity, and residual normality (Tabachnick et al., 2019). Based on table 2 it is known that all variables correlate to the main variable, but the correlation that occurs is not strong (< 0.700). Next, a multicholinearity analysis is carried out. The results show that all variables have a tolerance value of more than 0.1 and a VIF < of 10.0. Finally, scatter plots and Q-Q plots show that the data are distributed close to normal and the assumption of homoscedasticity is met. All assumptions are met so that the regression analysis can continue. The correlation test results also show that each domain and construct of PTG itself is strongly correlated with family hardiness (represented by FHI) and all three PTG domains show a strong correlation with the total score of PTG itself. This means that each domain of a PTG is closely related to the PTG in general.

Table 2. Correlation Between Variables

	Trauma Exposure	Family Hardiness	Postraumatic Growth (D1)	Postraumatic Growth (D2)	Postraumatic Growth (D3)	Postraumatic Growth (Total)
Age	0.368***	0.200*	0.382***	0.077	0.318***	0.339***
Gender	-0.160	0.126	-0.002	0.150	0.083	0.066
Marital Status	0.270***	0.161	0.271***	0.086	0.237**	0.252**
Employment Status	0.336***	0.097	0.290***	0.049	0.243**	0.256**
Bereavement	0.270***	-0.186*	-0.031	-0.143	-0.028	-0.059
Trauma Exposure	–	0.213**	0.447***	0.124	0.264***	0.361***
Family Hardiness	–	–	0.482***	0.434***	0.629***	0.531***

* p < 0.05, ** p < 0.01, *** p < 0.001

Ket: D1 = Domain of Self-Perception; D2 = Relation Domain; D3 = Philosophy of Life Domain

Then, a multilevel regression test was carried out with the results of the analysis as shown in table 3. The results showed that age, marital status, employment, and loss of family members together contributed as much as 14% in predicting posttraumatic growth (PTG). The four demographic variables were included in the regression analysis because they were found to have a strong correlation with the main variables in this study. Then, in the second stage, trauma exposure also significantly contributes to predicting PTG ($\Delta R^2 = 0.070$, $p < 0.001$). Finally, in the third stage, family hardiness is also known to contribute significantly in predicting PTG ($\Delta R^2 = 0.172$, $p < 0.001$). This suggests that the first hypothesis in the study was accepted, that trauma exposure and family hardiness significantly played a role in predicting PTG.

Furthermore, a mediation analysis was carried out related to the role of family hardiness on the relationship between trauma exposure and posttraumatic growth. The result is as seen in figure 2**.** Trauma exposure predicts posttraumatic growth, either directly or indirectly, through family hardiness. This suggests that the role of family hardiness as a mediator proved significant, partially. The more trauma exposure an individual experiences when a natural disaster occurs and the greater the impact the individual feels, through the presence of a high level of family hardiness, the individual will achieve a higher PTG condition ($c = 0.759$, $p < 0.01$) than if only considering the role of trauma exposure ($c' = 0.301$, $p < 001$). Therefore, the second hypothesis in this study is accepted, that family hardiness plays a significant role as a mediator of the relationship between trauma exposure and PTG.

Table 3. Multilevel regression test (Outcome: Posttraumatic Growth)

	Variabel	β	R^2	R^2 (Adj.)	ΔR^2	Total R^2
Stage 1	Age	0.201+	0.140	0.116	0.140***	
	Marital Status	0.094				
	Employment Status	0.164+				
	Loss of Family Member	-0.116				
Stage 2	Age	0.134	0.210	0.182	0.070**	0.382***
	MaritalStatus	0.068				
	Employment Status	0.113				
	Loss of Family Member	-0.181*				
	Trauma Exposure	0.301**				
Stage 3	Age	0.103	0.382	0.355	0.172***	
	MaritalStatus	0.044				
	Employment Status	0.104				
	Loss of Family Member	-0.064				
	Trauma Exposure	0.200*				
	Family Hardiness	0.442***				

Description: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

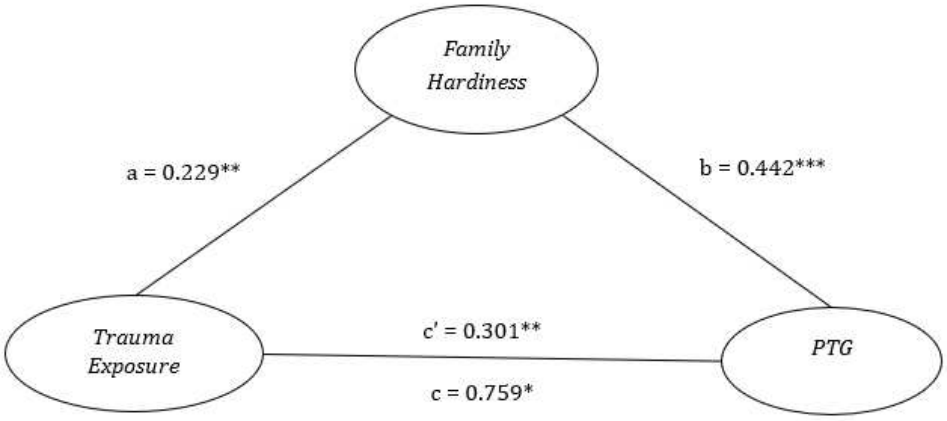

Figure 2. Mediating effects by family hardiness on the relationship of trauma exposure to posttraumatic growth

(Description: * p < 0.05, ** p < 0.01, *** p < 0.001; a, b, c, and c' are unstandardized effects; a = effect of trauma exposure on family hardiness; b = effect of family hardiness on posttraumatic growth; c' = direct effect of trauma exposure to posttraumatic growth; c = total effect of trauma exposure on posttraumatic growth).

Based on the results of the analysis that has been carried out, it is known that the hypothesis in this study is accepted, that trauma exposure and family hardiness can predict the achievement of individual posttraumatic growth, and family hardiness can be an intermediary in the role of predictors of trauma exposure to posttraumatic growth. More specifically, the mediation that occurs is partial because by controlling other variables (age, marital status (marital status), employment (employment status), and loss of family member/bereavement), trauma exposure still predicts posttraumatic growth well.

Posttraumatic growth itself is defined as the result of positive growth experienced by individuals after experiencing changes due to negative or traumatic events (Tedeschi & Calhoun, 2004). The results showed that trauma exposure and family hardiness predicted posttraumatic growth in participants. This means that the more diverse the traumatic events experienced by individuals when liquefaction in PASIGALA occurs, accompanied by the characteristics of family hardiness in their families, it turns out to be closely related to the achievement of higher levels of posttraumatic growth. This adds to the previous literature showing a link between family resilience, one of the main characteristics of which is the presence of family hardiness, with posttraumatic growth (Liu & Chen, 2018; Smith et al., 2016).

Furthermore, in this study, it was also found that family hardiness played a role in increasing the tendency of PASIGALA survivors who experienced intense tic trauma events, to achieve higher posttraumatic growth conditions. That is, families that have high family hardiness characteristics, this will help individuals in it to be able to achieve a higher level of posttraumatic growth, compared to individuals whose family hardiness is at a low level and compared to without family hardiness. Previously it was also known that family hardiness plays a central role in forming resilient families (McCubbin & McCubbin, 1996). The results of this study add insight that family hardiness also plays an important and direct role in post-traumatic growth. In addition, the results of this study

are also in line with previous studies that found that family resilience plays a positive role in posttraumatic growth in cancer survivors in China (Liu & Chen, 2018). Family resilience in the study has a subscale that is closely related to family hardiness, namely communication in the family and problem solving.

Furthermore, family hardiness is also considered one of the protective factors and mediators between stress-illness relationships (McCubbin & McCubbin, 1996). The finding that family hardiness is also a mediator in trauma-growth relationships provides new information that family hardiness also plays a role in the emergence of positive outcomes from the experience of traumatic events. Family hardiness is one of the variables that has an important role in the family adaptation model. As additional information, specifically the results of the study also show that the three domains of posttraumatic growth, namely growth from the aspects of self-perception, social relations (in general), and philosophy of life, are closely related to family hardiness.

This study adds literature related to the role of the family as an external factor that can help individuals achieve higher posttraumatic growth than if not taking into account the role of the family. However, it should be noted that the results of the research obtained depend on the context in which the research was conducted, namely on early adult liquefaction survivors in PASIGALA, the majority of whom have Kaili cultural backgrounds influenced by local wisdom that focuses on family ties and close brotherhood (Ahdiah & Amir, 2019).

CONCLUSION

Based on the results of the analysis obtained, it can be concluded that overall family hardiness plays an important role in individuals who experience traumatic events in PASIGALA to be able to achieve a higher posttraumatic growth condition. Therefore, in order for individuals to achieve a state of growth after experiencing a traumatic event such as a liquefaction natural disaster, families who are committed to each other, able to control various things that happen in the family, and willing to face challenges together, have the possibility of achieving a higher posttraumatic growth condition. In practical terms, the results of this study show that in creating a trauma healing program or post-natural disaster reconstruction program, especially with regard to earthquakes and liquefaction, communities or social workers may consider including programs that help families develop and maintain a good hardiness character (e.g. cooperation between family members) in the long term, in addition to providing programs for individual development that underline recognizing the strengths of themselves that they can harness when facing crisis situations.

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