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Effectiveness of Ifdil perceptual light therapy in reducing post-traumatic stress disorder of Lombok's earthquake victims

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Abstract
Earthquake as a disaster experienced by various regions, especially Lombok, caused psychological disturbances for its victims. These psychological disorders include post-traumatic stress disorder (PTSD) which arise when the same symptoms occur when an earthquake is experienced. The victim experienced a severe psychological condition due to sensory and perception of the earthquake as a dangerous thing. The victims of this earthquake need to get psychological treatment. The research objective is to examine teh effectiveness of Ifdil Perceptual Light Technique for Reducing Post-Traumatic Stress Disorder (PTSD). Ifdil perceptual light technique (IPLT) is one of the treatments that can be given to overcome PTSD caused of earthquake. Intervention using IPLT through sensory and perceptual modification of individuals through the light spectrum.This research uses single-subject design to seven subjectwho have experience a PTSD symptom of earthquake.Design research using design A-B-A single subject research. The instrument used are observation, interview, scaling technique and DSM-IV.Data were analyzed using the nonparametricWilcoxon signed-rank test. The result indicate that the respondents were high PTSD level before given IPLT. However after treatment, the symptom levels of respondents decreased. On the basis of the Wilcoxon test results, it also was found that the PTSD level of respondent before and after the IPLT'S treatment declined. The result shows that IPLT is effective in reducing PTSD disorders in earthquake victims. IPLT can be one alternative treatment in helping earthquake victims who experience psychological disorders.

Keywords: Ifdil Perceptual Light Technique (IPLT), PTSD, Single Subject Research, Post-Traumatic StressDisorder, student anxiety

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Introduction

Earthquakes have various consequences for the psychological condition of individuals ranging from children to adults. The disaster could cause clinical symptoms for children by making them cry easily, become more sensitive, get angry easily, and experience various changes in attitude because of the psychological trauma (Tauba et al., 2020; Thoyibah, Dwidiyanti, et al., 2019). Trauma is the main psychological impact of disasters (Shenk et al., 2010), including earthquakes. The earthquake that occurred in Lombok on August 5, 2018 with a 6.9 magnitude on the Richter scale (Ramdani et al., 2019) caused various structural damage and psychological impacts (Sumasto et al., 2019). In addition, it had both physiological and physical impacts on the lives of its victims (Thoyibah, Dwidiyanti, et al., 2019). A study found that this earthquake caused neurosis disorders (85.2%), psychotic symptoms (25.9%), and PTSD symptoms (64.7%) (Tauba et al., 2020; Thoyibah, Dwidiyanti, et al., 2019).

Disasters including natural, non-natural, and social disasters were found to have an impact on the lives victims (Goldmann & Galea, 2014). Based on recent data from WHO, the percentage of individuals

experiencing PTSD after the earthquake reached 3.8% (Bromet et al., 2017). The psychological effects of an earthquake include stress, anxiety, depression, and post-traumatic stress disorder (Shigemura et al., 2021). Therefore, the victims experienced a high percentage of psychological (78.6%), cognition (65.5%), emotional (63.2%), behavioral (65.6%), and social (42.4%) impacts (Misfitri et al., 2018). Earthquakes also cause fear and anxiety to enter a house, family relationship, economic, and ghost problems, including various illnesses (Thoyibah, Dwidiyanti, et al., 2019).

The above finding is also supported by research which found that earthquakes cause psychological shocks and economic problems due to irrational market analysis (D. Kong et al., 2021). This condition tends to cause psychological symptoms for victims of natural disasters, for example, those that lost family members, properties (D. Ergün & S. Şenyüz, 2021), and their jobs. The condition causes the psychological condition of the community in the disaster area to become worse, (Y. R. Han et al., 2021) example Prolonged Brief Disorder (D. Ergün & S. Şenyüz, 2021). Therefore, the government needs to rehabilitate the psychological condition of the community. This could be achieved by treating the victims. This treatment is needed because every country in the world has its own natural disasters, including earthquakes, which are experienced by many countries (Deniz Ergün & Solmaz Şenyüz, 2021; Young Ran Han et al., 2021; Dongmin Kong et al., 2021; Shenk et al., 2010; Shigemura et al., 2021).

Victims that live in coastal areas tend to experience psychological stress after an earthquake occurs (Hozawa et al., 2021). This condition is experienced by the people of Lombok that are dominantly surrounded by oceans. Based on the results of preliminary data obtained by the author, the symptoms experienced by the victims include trembling and often being confused, anxiety accompanied by tremors, fear of being crushed by rubble, the feeling of emptiness, frightened by voices such as the sound made by earthquakes, and dizziness when earthquake symptoms occur.

As shown in research, because victims sometimes have the symptom of fear of the sound of earthquakes, they are often afraid to enter the house because there is a fear of rumbling or loud noises which may sound similar to the noise by an earthquake (Farooqui et al., 2017). When a victim has psychological problems before an earthquake, those problems could become worse after the earthquake (Sherchan et al., 2018). Research also found that victims tended to experience serious and often long-lasting psychological conditions that affected their daily behavior (Marthoenis et al., 2016). When this condition is left unattended to, it could worsen the psychological condition of the victim. Based on this, earthquake victims need early detection and given mental health care (Sherchan et al., 2018). The treatment that needs to be carried out to reduce the impact of depression includes providing support to victims, for example to pregnant mothers, including after they have giving birth after the earthquake (Kuroda et al., 2021). Based on this explanation, it could be interpreted that the psychological impact experienced by earthquake victims is experienced by everyone, ranging from children to adults.

The care and treatment that has been rendered to the victims of the Lombok earthquake include trauma healing (Sumasto et al., 2019), spiritual counseling (Thoyibah, Purqoti, et al., 2019), group therapy (Hadi et al., 2020), and other interventions. However, more treatment is still needed to deal with the PTSD of the victims. As it is known that the symptoms that affect the memory of victims are powerful, it is necessary to make extra interventions than before. One of the treatments that could be carried out is using Ifdil Perceptual Light Therapy. This therapy was developed by Ifdil, and at the start of its development, the technique employed the method of changing the color spectrum, by closing the eyes with the help of the extreme hand (Ifdil et al., 2019). As is well known, a natural disaster is a very powerful event which is accepted by victims. Thus, they have the potential to experience psychological problems because of the wrong sensory reception caused by the enormity of the disaster experience.

The sensory errors of disaster victims tend to persist. This is because the problems resulting from a powerful stimulus are usually present in the subconscious. However, the process of modifying and eliminating them is not more powerful than the initial stimulus is received. Additionally, the modifications that have been carried out so far tend to be behavioral, not initial sensory. This was carried out in the intervention using IPLT. One of such treatments is when IPLT was used to treat clients that experienced ophiophobia and it was found to be effective (Ifdil et al., 2020). Based on the above finding, this research tested the effectiveness of IPLT to reduce PTSD in the victims of the Lombok earthquake. This intervention is considered to be able to help counselors, therapists, and psychology practitioners in providing effective treatment for earthquake victims.

Method

Ethical Approval

The client and the counselor completed the ethical approval procedure before therapy, and ethical approval to conduct this research was granted by by clients of victims of the Lombok natural disaster to counselors who handle victims in Lombok, West Nusatenggara. The client provided an information sheet at the pre-counseling meeting and agreed that the information can be collected, and used in the case study. Each session was recorded with the client's consent and given the opportunity if the client wants to stop recording. The clients are invited to comment and change personal details before they are published.

Participants

The subjects of this study were 7 (seven) people, which based on the results of the scaling, it was found that they experienced severe and very severe PTSD conditions. Subject has the initials AFA, HI, MGAG, MA, WH, M, and MW. Clients are given intervention by counselor Zulfikri, counselor Siti Laila Ismiratul Hilali and counselor Ahmad Ali Fathi Zain. The three counselors used a tool as IP Light Technologies to apply Ifdil Perceptual Light Technique to the seven clients.

The participants in this research were teenagers or students who earthquake Lombok victims and show high scale of stress, anxiety and trauma and they were willing to voluntarily be the subject of this research. There are 7 (seven) people who meet the criteria and willing to be given counseling interventions. A pseudonym was employed by those who received the intervention. So that the researchers' identities and concerns are well preserved.

The first customer stated that he had experienced trauma and was terrified of earthquakes. The client's trauma and dread are in the 8th range on the scaling scale. The second client is said to have suffered trauma as a result of the earthquake. The third client expressed worry, anxiety, and trauma as a result of the earthquake. The fourth client described the earthquake as making him feel shaky, bewildered, and anxious. The fifth client described feeling anxious and trembling when hearing the sound of an earthquake or seeing an earthquake. The sixth client stated that he was terrified of getting crushed by rubble or being trapped in the shadow of the ruins. The eighth client is described as having an aversion to earthquakes.

Sampling Procedure

It categorized the research subjects based on the PTSD conditions experienced by the Lombok earthquake victims. Subjects experienced the PTSD category in the heavy to very severe range, namely scaling at numbers 5 to 10. The subjects comprised the sexes of women and men who were members of the Lombok community.

Measure

This research used the single subject research (SSR) method. Moreover, this method is a type of quantitative research that involves studying the behaviour of each participant in detail(Neuman & McCormick, 2000). The single subject design involves using repeated measurements to really understand an individual's variability, in order that the effects of the treatment could be ascertained(Zhan & Ottenbacher, 2001). This method is often used in psychotherapy studies by investigating individuals based on two views, namely the individual as an object and as a unit of analysis (Alnahdi, 2015; S. I. Sasahara et al., 2020; Shinichiro et al., 2018). The instrument used are observation, interview, scaling technique and DSM-IV.

Experimental Interventions

Single subject research is a study conducted by observing the same object continuously and the results of its analysis based on the use of lines on the graph, namely horizontal lines for observation of treatment and vertical behavior(Freeman & Sugai, 2013; Liang, 2014). Measurement of the PTSD level of the subjects was carried out 3 times in each phase. The first phase is the baseline phase (A). In this phase, the level of the respondents' PTSD was measured before the IPLT treatment (Kratochwill, 2013). There were two baseline phases, namely baselines (A1) and (A2). The baseline phase (A1) described the conditions of the subjects before the IPLT intervention. Meanwhile, the baseline phase (A2) represented the condition after the intervention (Hayner, 2012).

Treatment Fidelity

This research used the single subject research (SSR) method. Moreover, this method is a type of quantitative research that involves studying the behaviour of each participant in detail (Neuman & McCormick, 2000). The single subject design involves using repeated measurements to really understand an individual's variability, in order that the effects of the treatment could be ascertained (Zhan & Ottenbacher, 2001). This method is often used in psychotherapy studies by investigating individuals based on two views, namely the individual as an object and as a unit of analysis (Alnahdi, 2015; S.-i. Sasahara et al., 2020; Shinichiro S et al., 2018). Single subject research is a study conducted by observing the same object continuously and the results of its analysis based on the use of lines on the graph, namely horizontal lines for observation of treatment and vertical behavior (Freeman & Sugai, 2013; Liang, 2014).

The first step was to obtain the target behavior data at the first baseline condition (A1). After the data had stabilized, intervention was then given (B). Data collection in intervention conditions was carried out continuously until the data reached a clear trend and level. After that, each condition of the baseline (A1), and intervention (B), was repeated for the same respondent (A2). The subjects of the study were seven patients with PTSD symptoms, and the therapy used was Ifdil Perceptual Light Technique (Ifdil et al., 2020; Ifdil et al., 2019).

Research Design

The research design used was A-B-A (Baseline (A1) - Intervention (B) - Baseline (A2) (Kratochwill, 2013; Sunanto et al., 2006). The data collection and analysis of intervention effects were done using this A-B-A design. The intervention phase (B) was carried out according to the Ifdil Perceptual Light Technique methodology (IPLT). Respondents took measurements again after each session to get a picture of changes in the subject after following the intervention utilizing IPLT. Face-to-face therapeutic sessions last 10 to 15 minutes and are conducted face-to-face. Following that, each session was assessed to determine the amount of the subject's changes. Following the implementation of the intervention session for 3 (three) weeks, the follow-up stage was conducted.

During the initial phase, the researchers monitored and gathered data for a period of time until the data stabilized, which took three weeks. After the trend and level of the intervention phase data stabilized, the researcher repeated the baseline phase. After the IPLT intervention, a follow-up was conducted to assess the subject's condition. The changes that occur and the effectiveness of the IPLT can be recognized by a decrease in the client's degree of anxiety, stress, and trauma to the earthquake when the measurement results after the intervention procedure are compared to the measurement findings before the intervention is delivered.

Data Analysis

The general description of this research are: the first step was to obtain the target behavior data at the first baseline condition (A1). After the data had stabilized, intervention was then given (B). Data collection in intervention conditions was carried out continuously until the data reached a clear trend and level. After that, each condition of the baseline (A1), and intervention (B), was repeated for the same respondent (A2). The subjects of the study were seven patients with PTSD symptoms, and the therapy used was Ifdil Perceptual Light Therapy (Ifdil et al., 2020; Ifdil et al., 2019). Data were obtained using the scaling technique (Erford, 2014) and observation sheet (Oei et al., 2013; Osman et al., 2012). They were then analyzed using visual data analysis and the statistical test of nonparametric Wilxocon signed-rank test. The research data set could be accessed at osf.io/qgkyw/.

Results and Discussion

Measurement of the PTSD level of the subjects was carried out 3 times in each phase. The first phase is the baseline phase (A). In this phase, the level of the respondents' PTSD was measured before the IPLT treatment (Kratochwill, 2013). There were two baseline phases, namely baselines (A1) and (A2). The baseline phase (A1) described the conditions of the subjects before the IPLT intervention. Meanwhile, the baseline phase (A2) represented the condition after the intervention (Hayner, 2012).

In the baseline phase (A1), there was a seemingly stable trend. This is because the value of the subjects' PTSD level/condition from the beginning to the end of the phase was around the mean of 7.6. However, subsequent intervention (B) using IPLT caused a decrease in the average measurement to 4. Moreover,

after the intervention, it was discovered that the average condition at the baseline (A2) decreased to 1.1. Based on these findings, the difference in the number before and after the intervention was 6.5 and showed a decreasing trend. This suggests that the more intervention was given, the lower the target'saverage condition, signifying a positive (+) trend, and the effectiveness of the treatment in reducing the level ofPTSD. Additionally, the results of the graphical analysis in groups couldbe summarisedto show that hypnotherapy was effective in reducing thePTSD levels.

As for using Wilcoxon Rank Test analysis, the above findings showed positive ranks or differences in using IPLT on PTSD level based on pre-test and post-test data. The data showed that there were 7 positive data (N), meaning that the 7 subjects experienced a decrease in PTSD level from the pretest value to the post test value. Based on the Test Statistics output known, when compared between pretest and posttest data, the value of Z was −2.388b, mean of pre–post-test, 4, and significance (2 tailed), 0.017 (<0.05). Where the value was smaller <0.05, it could be concluded that Ha is accepted. There was a significant difference in the level of PTSD between pretest and posttest of the data. In other words, there was a significant decrease in thePTSD level after receiving treatment with IPLT.

Post traumatic stress disorder caused by earthquake begins with very devastating events that are seriously accepted by clients (Ifdil et al., 2019). The baseline condition (A1) indicated that there was still an error or even failure in the clients' sensory capabilities. The situation could occur because sometimes the sensory stimuli clients receive when dealing with symptoms of an earthquake exceeds their sensory abilities (Ifdil et al., 2019). Examples of these symptoms include fear of earthquake vibrations and sounds. Also, clients are sometimes affected by the memory of a close person they lost due to the earthquake, or physical damage to themselves orsomeone else. Circumstances like this could then go into their subconscious mind and become permanent values. This means that when the IPLT treatment has not been given, the subjects' PTSD level was on average was very high. The intervention phase(B) described the condition of the subject when given the intervention (Sunanto et al., 2006). From the treatment results in this phase, the mean value was 4. This means that the subjects' level decreased by 3.6 when compared to the phase before the treatment. Thus, IPLT was proven to be able to reduce PTSD.

The baseline phase (A2) showed a mean value of 1.1. When compared with the baseline (A1), the client's condition before being given an IPLT intervention, decreased considerably. The phase after this intervention was given proved that individual sensory processes could be improved using IPLT.

All initial sensories related to the earthquake symptom experienced by the client were modified by the IPLT technique. The procedure used in its implementation is the IPLT-C procedure. Namely, the insight procedure, Processing of Building Rapport Lighting Techniques Tools and Techniques, and Closing and Follow Up. In addition to these procedures, IPLT makes use of specifically designed lamp lights. This study showed that this treatment is very effective in reducing PTSD symptoms of Lombok earthquake victims. The more interventions were given, the lower the level of the subjects' PTSD. The change was clearly seen from the measurement results of the subjects' level in each phase. This is supported by the results of research that there is a positive change in the level of PTSD in subjects.

A qualitative assessment of the interventions used was also carried out. Here, the subjects stated that the IPLT greatly helped them reduce their fear of earthquakes, and control themselvesin order to feel calm. They also stated that it helped them overcome the trembling feeling, including the state of being confused. Intervention using IPLT is considered effective because the therapy uses sensory modification with the help of light (Ifdil et al., 2019).

Sensory processing problems are difficulties in organizing and responding to incoming information through the senses (Galvan-Garza et al., 2017; Von Békésy, 2017). Earthquake victims experience sensory problems where symptoms of PTSD appear when they hear rumbling sounds such as earthquakes or debris. Certain sounds, sights, smells, textures, and tastes couldcreate a feeling of "sensory overload" (Harricharan et al., 2017).Apart from the use of the light spectrum, IPLT also changes the perception of individuals. The earthquake victims had the perception that an earthquake was something scary, dangerous, and life-threatening. Therefore, the sensory from the earthquake, including their perceptual which was also wrong led to thePTDS symptom.

It is known that various problems in life are indirectly influenced by individual perceptions because humans are perceptual creatures (Sheng et al., 2017). Individuals would have problems when the sensory received exceeds the ability of individual sensors, enter the sub-conscious, and become a sub-conscious permanent value. Therefore, IPLT treatment becomes important since it modifies sensory processes, including the perceptions caused by the earthquake.This therapy works by changing the color spectrum of

the light, by closing the eyes with the help of the extreme hand (Ifdil et al., 2019). Thus, it couldeffectively reduce the psychological disturbances experienced by earthquake victims. Interventions using light therapy have been carried out in the media world and are still being used for diagnosis (Tsushima et al., 2021). Therefore, due to the benefits of the use of light, IPLT was developed. This therapy is expected to be a tool for counselors, therapists, and other psychological experts to deal with individual psychological disorders, especially those caused by earthquakes.

Conclusion

This research showed that IPLT was effective in reducing the PTSD symptom in the respondents. This is because there was a significant change before and after the treatment. Before theIPLT treatment, the respondents were in the very heavy category, however, after the treatment they were inthe simple and light category. This shows that the therapy is effective in decreasing the PTSD level of earthquake victim.

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References

Alnahdi, G. H. (2015). Single-subject designs in special education: advantages and limitations. *Journal of Research in Special Educational Needs*, *15*(4), 257-265.

Bromet, E. J., Atwoli, L., Kawakami, N., Navarro-Mateu, F., Piotrowski, P., King, A., Aguilar-Gaxiola, S., Alonso, J., Bunting, B., & Demyttenaere, K. (2017). Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. *Psychological medicine*, *47*(2), 227.

Erford, B. T. (2014). *40 Techniques Every Counselor Should Know*. Pearson Education.

Ergün, D., & Şenyüz, S. (2021). Prolonged grief disorder among bereaved survivors after the 2011 Van Earthquake in Turkey [Article]. *Death Studies*. https://doi.org/10.1080/07481187.2021.1884624

Ergün, D., & Şenyüz, S. (2021). Prolonged grief disorder among bereaved survivors after the 2011 Van Earthquake in Turkey. *Death Studies*, 1-8.

Farooqui, M., Quadri, S. A., Suriya, S. S., Khan, M. A., Ovais, M., Sohail, Z., Shoaib, S., Tohid, H., & Hassan, M. (2017). Posttraumatic stress disorder: a serious post-earthquake complication. *Trends in psychiatry and psychotherapy*, *39*(2), 135-143.

Freeman, J., & Sugai, G. (2013). Identifying evidence-based special education interventions from single-subject research. *Teaching Exceptional Children*, *45*(5), 6-12.

Galvan-Garza, R., Valko, Y., Dahlem, K., Mulavara, A., Schmahmann, J., & Lewis, R. (2017). Does the cerebellum help solve the "signal-to-noise" problem in sensory processing: evidence from vestibular activation in patients with cerebellar dysfunction (P6. 321). In: AAN Enterprises.

Goldmann, E., & Galea, S. (2014). Mental health consequences of disasters. *Annual review of public health*, *35*.

Hadi, S., Widarna, D., Putri, L., & Kirana, D. L. (2020). Support Group Therapy as an Alternative to Reduce Stress in Caregiver ODGJ Lombok Earthquake Victims. 2nd International Conference on Islam, Science and Technology (ICONIST 2019),

Han, Y. R., Jeong, Y. W., Kim, S. K., & Jeong, H. S. (2021). Changes in the levels of stress perception, experiencing depressive symptoms and health-related quality of life of residents after the 2016 gyeongju earthquake [Article]. *International journal of environmental research and public health*, *18*(2), 1-13, Article 540. https://doi.org/10.3390/ijerph18020540

Han, Y. R., Jeong, Y. W., Kim, S. K., & Jeong, H. S. (2021). Changes in the levels of stress perception, experiencing depressive symptoms and health-related quality of life of residents after the 2016 Gyeongju earthquake. *International Journal of Environmental Research and Public Health*, *18*(2), 540.

Harricharan, S., Nicholson, A. A., Densmore, M., Théberge, J., McKinnon, M. C., Neufeld, R. W., & Lanius, R. A. (2017). Sensory overload and imbalance: resting-state vestibular connectivity in PTSD and its dissociative subtype. *Neuropsychologia*, *106*, 169-178.

Hayner, K. A. (2012). Effectiveness of the California Tri-Pull Taping method for shoulder subluxation poststroke: A single-subject ABA design. *American Journal of Occupational Therapy*, *66*(6), 727-736.

Hozawa, A., Tanno, K., Nakaya, N., Nakamura, T., Tsuchiya, N., Hirata, T., Narita, A., Kogure, M., Nochioka, K., & Sasaki, R. (2021). Study profile of the tohoku medical megabank community-based cohort study. *Journal of epidemiology*, *31*(1), 65-76.

Ifdil, I., Fadli, R. P., Zola, N., Churnia, E., Putri, Y. E., & Amalianita, B. (2020). The Effectiveness of Ifdil Perceptual Light Technique in Reducing Ophidiophobia. *Addictive Disorders & Their Treatment*, *19*(4), 247-251.

Ifdil, I., Zola, N., & Fadli, R. P. (2019). Ifdil perceptual light technique (IPLT) an alternative brief approach for the reduction of trauma, phobia and psychological problems. *Jurnal Konseling Dan Pendidikan*, *7*(2), 50-57.

Kong, D., Lin, Z., Wang, Y., & Xiang, J. (2021). Natural disasters and analysts' earnings forecasts [Article]. *Journal of Corporate Finance*, *66*, Article 101860. https://doi.org/10.1016/j.jcorpfin.2020.101860

Kong, D., Lin, Z., Wang, Y., & Xiang, J. (2021). Natural disasters and analysts' earnings forecasts. *Journal of Corporate Finance*, *66*, 101860.

Kratochwill, T. R. (2013). *Single subject research: Strategies for evaluating change*. Academic Press.

Kuroda, Y., Goto, A., Koyama, Y., Hosoya, M., Fujimori, K., Yasumura, S., Nishigori, H., Kuse, M., Kyozuka, H., Sato, A., Ogata, Y., Hashimoto, K., Japan, E., & Children's, S. (2021). Antenatal and postnatal association of maternal bonding and mental health in Fukushima after the Great East Japan Earthquake of 2011:The Japan Environment and Children's Study (JECS) [Article]. *Journal of Affective Disorders*, *278*, 244-251. https://doi.org/10.1016/j.jad.2020.09.021

Liang, L. W. C. (2014). Pure love and beyond: Suzuki Tadashi's use of Taiwanese popular music in la Dame aux Camélias (2011) [Article]. *Asian Theatre Journal*, *31*(1), 204-227. https://doi.org/10.1353/atj.2014.0015

Marthoenis, M., Yessi, S., Aichberger, M. C., & Schouler-Ocak, M. (2016). Mental health in Aceh–Indonesia: a decade after the devastating tsunami 2004. *Asian journal of psychiatry*, *19*, 59-65.

Misfitri, S., Bahri, S., & Bakar, A. (2018). Kondisi Psikologis Siswa SMP Pasca Gempa Bumi di Kecamatan Meureudu Pidie Jaya. *JIMBK: Jurnal Ilmiah Mahasiswa Bimbingan & Konseling*, *3*(3).

Neuman, S. B., & McCormick, S. (2000). A case for single-subject experiments in literacy research. *Handbook of reading research*, *3*, 181-194.

Oei, T. P., Sawang, S., Goh, Y. W., & Mukhtar, F. (2013). Using the depression anxiety stress scale 21 (DASS-21) across cultures. *International Journal of Psychology*, *48*(6), 1018-1029.

Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G. (2012). The depression anxiety stress Scales—21 (DASS-21): further examination of dimensions, scale reliability, and correlates. *Journal of clinical psychology*, *68*(12), 1322-1338.

Ramdani, F., Setiani, P., & Setiawati, D. A. (2019). Analysis of sequence earthquake of Lombok Island, Indonesia. *Progress in Disaster Science*, *4*, 100046.

Sasahara, S.-i., Andrea, C.-S., Suzuki, G., Oi, Y., Doki, S., Hori, D., Ohira, T., Matsuda, C., Inoue, N., & Takahashi, T. (2020). Effect of exercise on brain function as assessed by functional near-infrared spectroscopy during a verbal fluency test in a simulated International Space Station environment: A single-case, experimental ABA study in Japan. *Acta Astronautica*, *166*, 238-242.

Sasahara, S. I., Andrea, C. S., Suzuki, G., Oi, Y., Doki, S., Hori, D., Ohira, T., Matsuda, C., Inoue, N., Takahashi, T., Ohtaki, Y., Saito, T., Furukawa, S., Ogata, K., & Matsuzaki, I. (2020). Effect of exercise on brain function as assessed by functional near-infrared spectroscopy during a verbal fluency test in a simulated International Space Station environment: A single-case, experimental ABA study in Japan [Article]. *Acta Astronautica*, *166*, 238-242. https://doi.org/10.1016/j.actaastro.2019.10.013

Sheng, F., Du, N., & Han, S. (2017). Degraded perceptual and affective processing of racial out-groups: An electrophysiological approach. *Social neuroscience*, *12*(4), 479-487.

Shenk, D., Mahon, J., Kalaw, K. J., Ramos, B., & Tufan, I. (2010). Understanding the disaster experience of older adults by gender: the experience of survivors of the 2007 earthquake in Peru. *Health care for women international*, *31*(11), 965-980.

Sherchan, S., Samuel, R., Marahatta, K., Anwar, N., Van Ommeren, M. H., & Ofrin, R. (2018). Post-disaster mental health and psychosocial support: experience from the 2015 Nepal earthquake. *WHO South-East Asia journal of public health*, *6*(1), 22-29.

Shigemura, J., Terayama, T., Kurosawa, M., Kobayashi, Y., Toda, H., Nagamine, M., & Yoshino, A. (2021). Mental health consequences for survivors of the 2011 Fukushima nuclear disaster: a systematic review. Part 1: psychological consequences. *CNS spectrums*, *26*(1), 14-29.

Shinichiro S, Oi Y, & Hirai Y, e. a. (2018). Exercise can maintain brain function by fNIRS using VFT in confined environment like ISS in Japan - Single case experimental ABA design. Proceedings of the International Astronautical Congress, Dubai, Uni Emirates Arab.

Shinichiro, S., Oi, Y., Hirai, Y., Doki, S., Ohtaki, Y., Hori, D., Andrea, C. S., Takahashi, T., Saito, T., & Matsuzaki, I. (2018). Exercise can maintain brain function by fNIRS using VFT in confined environment like ISS in Japan - Single case experimental ABA design. Proceedings of the International Astronautical Congress, IAC,

Sumasto, H., Suparji, W. N., Ngestiningrum, A. H., Setiawan, S. B., & Najib, M. (2019). Trauma healing during the earthquake disaster emergency response phase in Lombok, Indonesia. *Indian J Forensic Med Toxicol*, *13*(4), 1745-1748.

Sunanto, J., Takeuchi, K., & Nakata, H. (2006). Penelitian dengan subjek tunggal. In: Bandung: UPI Press.

Tauba, A. M., Suryani, S., & Rafiyah, I. (2020). The Lived Experiences of the Lombok Earthquake Survivors. *Nurse Media Journal of Nursing*, *10*(1), 22-35.

Thoyibah, Z., Dwidiyanti, M., Mulianingsih, M., Nurmayani, W., & Wiguna, R. I. (2019). Gambaran dampak kecemasan dan gejala psikologis pada anak korban bencana gempa bumi di Lombok. *Holistic Nursing and Health Science*, *2*(1), 31-38.

Thoyibah, Z., Purqoti, D. N. S., & Oktaviana, E. (2019). Spiritual counseling on anxiety level in (Lombok) Indonesian earthquake victims. *Malahayati International Journal of Nursing and Health Science*, *2*(2), 92-99.

Tsushima, T., Suzuki, T., Terao, T., Miura, D., Narita, K., Takeuchi, M., Shimuzu, A., & Matsue, K. (2021). Light chain deposition disease involving kidney and liver in a patient with IgD myeloma [Article]. *BMC Nephrology*, *22*(1), Article 40. https://doi.org/10.1186/s12882-021-02246-9

Von Békésy, G. (2017). Sensory inhibition. In *Sensory Inhibition*. Princeton University Press.

Zhan, S., & Ottenbacher, K. J. (2001). Single subject research designs for disability research. *Disability and rehabilitation*, *23*(1), 1-8s.