

# EFFECTIVENESS OF A BRIEF MINDFULNESS BASED INTERVENTION TO PROMOTE POSTTRAUMATIC GROWTH IN CANCER PATIENTS

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## ABSTRACT

*The purpose of this study was to determine the effectiveness of a brief mindfulness based intervention to promote posttraumatic growth in cancer patients. The research design used was untreated control group design with pretest and posttest samples. Subjects in this study were 21 cancer patients that were divided into an experimental group (n=10) and a control group (n=11). Data were analyzed using Anova Mixed Design. The analysis showed significant changes of posttraumatic growth in the experimental group (MD=-14,400; p=0,000, p<0,05) and in the control group changes of posttraumatic growth were not significant (MD=-0,273, p=0,914, p>0,05). The results show that a brief mindfulness based intervention, which in this case is mindfulness training and yield significant results towards increased scores of posttraumatic growth in cancer patients. Hence, mindfulness based intervention can be used as one of psychotherapy to help individual psychologically growth.*

**Keywords:** *mindfulness, posttraumatic growth, cancer patients*

## INTRODUCTION

Experiencing cancer can lead to high psychological burden, stress, difficulties of adjustment, and decreased quality of life not only for the individuals concerned but also for the family (Fuemmeler *et al.*, 2003; Long & Marsland, 2011; Mazzotti *et al.*, 2013). Individuals who are diagnosed with cancer have to struggle with some decisions to be taken immediately related to the treatment (Hoffman *et al.*, 2013; Rachmawati & Halimah, 2014). Cancer is the most challenging disease to treat because it goes through several dimensions within individuals, ranging from physical, psychological, to spiritual (Efficace & Marrone, 2002). The diagnosis of cancer causes a number of feelings for the individuals, such as deep sadness, denial, stress, fear, and depression. Deep sadness happens because the individuals feel that there is no future. Fear and denial emerge because cancer is lethal, and it causes limitations in physical activity. Stress arises as a result of changes in weakened physical condition, painful treatment, and medically related procedures that the individuals must go through within a certain time at the hospital.

Cancer experience is generally deemed a painful wound that is hard to describe precisely. Several responses are raised from the very beginning of the diagnosis to the treatment process, comprised of self-closure, low adaptability, depression, and difficulty of sleeping. Suffering from cancer causes individuals to sacrifice many aspects, such as time with family, work, education, and related financial matters during the course of treatment. Even individuals who have suffered cancer for several years still feel the pain and sadness while remembering the early days of diagnosis and treatment. Remembering and recounting cancer experience is uncomfortable and unpleasant in which drive individuals to avoid them as they can cause certain emotional responses, such as bursting tears.

Cancer treatment is linked to psychological burden not only on patients but also on families (Fuemmeler *et al.*, 2003; Mazzotti *et al.*, 2013). The family function, the quality of marriage, and the quality of parenting have changed along with the diagnosis of cancer experienced by one family member. Furthermore, cancer care requires complex rules requiring individuals to be in a hospital or outpatient clinic for one to two years (Long & Marsland, 2011).

The growth in medical treatment for cancer does not necessarily make the problem for patients to be easily overcome. Individuals who recover successfully still have to face a number of risks. These risks include the possibility of recurrence or the emergence of other cancers, faster death, impaired cognitive function, and low quality of life (Oeffinger & Hudson, 2004). Hence, cancer is categorized as a traumatic event for the individuals (Rachmawati & Halimah, 2014). This, however, does not necessarily result in negative consequences, but the positive process can also turn up (García *et al.*, 2014; Loïselle *et al.*, 2011). The traumatic event they experienced provides positive implications toward posttraumatic growth (Hamama & Sharon, 2013; Klosky *et al.*, 2014; Shakespeare-Finch & Enders, 2008; Tedeschi & Calhoun, 2004). Posttraumatic growth has been reported to occur following the experience of cancer (Büyükaşık-Çolak *et al.*, 2012; Rachmawati & Halimah, 2014; Teixeira & Pereira, 2013; Thombre, Sherman, & Simonton, 2010; Weiss, 2000).

Factors that facilitate the emergence of posttraumatic growth are being developed as a field of research. The results of empirical research support the relationship between mindfulness-based interventions with outcomes associated with posttraumatic growth. Mindfulness is an important protective factor occurring immediately after a traumatic experience, and it facilitates the possibility of discovering the meaning of the difficulties experienced (Hanley *et al.*, 2015).

Mindfulness is a way to connect with the rest without judgment and avoidance, contributing to reducing all the suffering experiences and increasing well-being (Baer, 2003; Follette *et al.*, 2006; Germer *et al.*, 2005; Schirda *et al.*, 2015). Research linking mindfulness to posttraumatic growth has successfully revealed the relationship between the two by looking at the relationship of each dimension constructs associated with the observational capacity (Chopko & Schwartz, 2009; Follette *et al.*, 2006; Hanley *et al.*, 2015). Mindfulness helps traumatized individuals by increasing the focus on the present moment and letting go of the suffering in the past and fear of the future (Follette *et al.*, 2006). Related to that, the effectiveness of a brief mindfulness-based intervention to promote posttraumatic growth in cancer patients is important to investigate.

Posttraumatic growth is the experience of positive changes that occur as a result of the struggle in facing distressed life crisis conditions (Calhoun & Tedeschi, 1999; Garland *et al.*, 2007; Su & Chen, 2015; Tedeschi & Calhoun, 2004). Posttraumatic growth consists of five dimensions; those relating to others, new possibilities, personal strength, spirituality, and appreciation of life (Taku *et al.*, 2008; Tedeschi & Calhoun, 1996, 2004). Posttraumatic growth can also be influenced by several factors such as the environment (the difficulty level of trauma, social support, social, and cultural influence) and individual characteristics (personality, stress management, coping style, emotional self-disclosure) (Calhoun & Tedeschi, 2006; Tedeschi & Calhoun, 2004).

Posttraumatic growth theoretically declares that the traumatic event destroys individuals' assumptions about the world. Posttraumatic growth is understood as the result of confrontation by individuals to a traumatic event. The process of confrontation requires individuals to reconstruct the destructive things and rebuild a stronger structure (Calhoun & Tedeschi, 1999, 2006; Splevins, Cohen, Bowley, & Joseph, 2010). Individual growth in the posttraumatic growth model is understood exclusively as a result of the individuals' confrontation with trauma. The process of confrontation requires individuals involved in the cognitive process to reconstruct the destructive things first in order to develop posttraumatic growth (Calhoun & Tedeschi, 2006).

Posttraumatic growth occurs only when an event simply compresses the individual schematic structure. Growth occurs when individuals rebuild structures that are more resilient to events of the future. The process of making meaning avails individuals to achieve higher levels of function that lead to growth (Tedeschi & Calhoun, 2004). Posttraumatic growth involves individuals' perceptions of the growth experienced (Shigemoto & Poyrazli, 2013). Mindfulness is the degree of individuals' capability of developing nonjudgmental awareness in monitoring internal and external experiences (Burke, 2009; Widdett, 2014). The core features of mindfulness are openness, receptive awareness, and attention (Baer *et al.*, 2006; Brown & Ryan, 2003; Burke, 2009; Ho *et al.*, 2015; Mace, 2008). Mindfulness consists of a number of dimensions, which are observation, description, acting with awareness, and nonjudgmental awareness (Knowles *et al.*, 2015). Benefits of mindfulness, in general, can be seen in four main fields of mental health and psychological well-being, physical health, behavior regulation as well as the quality of relationships and social interaction (Brown *et al.*, 2007). Mindfulness is considered a simple way to connect with current experience. This construct has long been used to reduce the pain of the adversity of life experienced by the individuals. This is especially true for individuals who seem to push themselves (Germer *et al.*, 2005).

Mindfulness based intervention is a potential equipment of mental health promotion (Nyklíček *et al.*, 2012; Soons *et al.*, 2010). Mindfulness based intervention can enhance personal growth, self-acceptance, empathy, and self-transcendence as well as reducing the levels of stress and social anxiety (Soons *et al.*, 2010). Being aware of the present moment and realizing that it is the only real time owned can be very beneficial for the mind and body (Widdett, 2014). There are three key components of mindfulness; namely the intention, attention, and attitudes; the interactions of which are called reperceiving. Reperceiving leads individuals to have a better recognition to reflect more objectively on the values and freely choose behaviors that reflect those value (Shapiro *et al.*, 2006). Furthermore, the dimensions of posttraumatic growth also reflect changing values in attitudes and behavior (Tedeschi & Calhoun, 2004). Therefore, mindful individuals are more likely to experience posttraumatic growth (Burke, 2009). Posttraumatic growth and mindfulness reflect observational capacity (Shapiro *et al.*, 2006). Mindfulness can help explain the relationship between growth and adaptive behavior capacity (Helgeson *et al.*, 2006). Individuals who report the greater number of mindfulness and posttraumatic growth will experience the lower level of distressed (Burke, 2009). Based on this, the hypothesis of this study is a brief mindfulness-based intervention is effective to promote posttraumatic growth in cancer patients.

## METHODS

The study is a quasi-experimental research. Quasi-experiments divide the individuals who enter control and experimental groups not by random assignment. The designs used are untreated control group designs with pre-test and post-test samples. Subjects in both groups are given pretest first. The experimental group is then given mindfulness-based intervention, and the control group is not. Furthermore, post-test is given to both groups to see post-traumatic growth changes occurring. This study uses post-test twice, once immediately after training and one with an interval of one week after the training.

In commence, there are 22 subjects equally divided into experimental and control groups. However, one subject from experimental group is excluded because of the subject's comprehension and familiarity with mindfulness practice. Thus, for data analysis the total subjects are 21 for both experimental group (n=10) and control group (n=11). The inclusion criteria of the study subjects are (1) the individual concerned is a cancer patient with a maximum stage of IIIB. (2) Committed to doing mindfulness exercises every day within a span of one week based on handouts given. (3) Has no

communication disturbance and is able to understand the instructions. (4) Willing to undergo intervention and the whole series of research. (5) Aged between 18 and 60.

The maximum cancer stage is stage IIIB because patients who are at a stage above IIIB are patients with advanced cancer whose condition is medically high-risk to be included in the training. Concerning age, the study subjects are individuals with cancer who are in the early adult age range 18 years old to 40 years old and middle age range 41 years old to 60 years old. The age range is given a maximum of 60 years because only individuals aged less than 60 years feel the benefit from mindfulness interventions (Nyklíček *et al.*, 2012).

In addition, the criteria of subjects' exclusion are (1) subject is in the middle of a study period known to have undergone similar interventions with those given. (2) The subject is in the middle of a study period known to undergo other psychological interventions that can lead to confusion. (3) The subject is involved in mindfulness one-week-routine exercise for less than 70% of the total. Information related to the research are announced to patients by the assistance of Dr. Wahidin Sudirohusodo Hospital, as the center of cancer treatment in Eastern Indonesia and helped by Think Survive-Cancer Women Care Foundation. Patients interested in the intervention program are placed in the experimental group.

A brief mindfulness based intervention in this study is an intervention in the form of training based on the concept of mindfulness. The intervention at the bottom line introduces and teaches mindfulness techniques. Subjects in the experimental group are given mindfulness training based on modules that have been previously designed. The training is delivered by a clinical psychologist and a professional trainer. Interventions are presented with several methods, ranging from explanations, discussions, and role-plays. Moreover, after given the guide to practice mindful activities every day, the participants are asked to commit routinely to do the practice for one week.

The intervention emphasizes the core principle of mindfulness that relies on present experience, meditation, and its benefit. The goals of the mindfulness-based intervention are (1) to provide understanding related to mindfulness in everyday life. (2) To teach the basics of mindfulness practice. (3) Participants are able to develop in terms of building relationships with others, discovering new opportunities along with gaining better personal strength, changing spirituality, and a better appreciation of life.

The demographic questionnaire is a set of questions about the subject's self. The questionnaire contains the required subject data. They include gender, age, education, occupation, diagnosis, stage, type of treatment, and so forth. The posttraumatic growth measurement used is an adaptation scale in Indonesian from The Posttraumatic Growth Inventory. The scale is developed by Tedeschi, with reference to the dimension of posttraumatic growth. The scale consists of 21 items with a rating of 6 Likert points. Subjects are asked to select one of the options by using six rating categories to complete each item.

The Posttraumatic Growth Inventory used in this study is adapted into Bahasa by linguists to validate language conformity by using back forward translation method. This study also uses content validity. The content validity is calculated by Aiken's V formula to obtain content validity coefficient based on the expert panel's assessment of the items contained in the instrument. The result shows the content validity ranging from 0,7 to 0,95 which means good validity. On the other hand, the item total correlation range from 0,395 to 0,760 and the reliability of the measuring instruments is known with Cronbach Alpha test ( $\alpha = 0,928$ ).

Associated with hypothesis testing, the data analysis used is ANOVA Mixed Design. Analysis with ANOVA Mixed Design combines two sub-analysis, within the subject test and between subject tests. Within subject, the test is a test of difference score in one group (comparing pretest and posttest).

Meanwhile, the between subject test is testing the difference of scores between groups (comparing experimental and control groups). The whole series of studies have obtained permission from the ethics committee of health research No. Register UH15100030 on January 14, 2016. The permission is issued by the Chairman of the Ethics Committee for Health Research, Medical Faculty of Hasanuddin University, RSPTN Hasanuddin University, and Dr. Wahidin Sudirohusodo Hospital.

## RESULTS AND DISCUSSIONS

Subjects' average age is 41,47 years, and they are entirely women. The type of cancer includes breast cancer (90,47%), thyroid (4,76%), and ovarian (4,76%). Subjects are in the range of stage IB (4,76%), IIA (33,33%), IIB (42,85%), IIIA (9,52%), and IIIB (9,52%). Overall, the research subjects have been suffering from cancer in the range of 4 months to 17 years with a variation of recurrence in it. In relation to marital status, there are three variations; married (85,71%), single (9,52%), and divorced (4,76%). Subjects of research work (61,90%) have a variety of professional backgrounds ranging from doctors, midwives, teachers, civil servants, private sector employees, entrepreneurs, to activists. Subjects of the study have a range of education from high school to doctoral, mostly located in the undergraduate level (52,38%). The demographic can be seen in Table 1.

Table 1 Demographic

	Experiment	Control
Age ( <i>Mean</i> )	40,5	42,36
Sex		
Female, <i>n (%)</i>	10 (100)	11(100)
Cancer type		
Breast, <i>n (%)</i>	10 (100)	9 (81,81)
Thyroid, <i>n (%)</i>	0 (0)	1 (9,09)
Ovarian, <i>n (%)</i>	0 (0)	1 (9,09)
Stage of cancer		
IB, <i>n (%)</i>	1 (10)	0 (0)
IIA, <i>n (%)</i>	2 (20)	5 (45,45)
IIB, <i>n (%)</i>	5 (50)	4 (36,36)
IIIA, <i>n (%)</i>	1 (10)	1 (9,09)
IIIB, <i>n (%)</i>	1 (10)	1 (9,09)
Marital status		
Single, <i>n (%)</i>	1 (10)	1 (9,09)
Married, <i>n (%)</i>	8 (80)	10 (90,90)
Divorced, <i>n (%)</i>	1 (10)	0 (0)
Working status		
Work, <i>n (%)</i>	7 (70)	6 (54,54)
Unemployed, <i>n (%)</i>	3 (30)	5 (45,45)
Education		
High School, <i>n (%)</i>	2 (20)	1 (9,09)
Diploma, <i>n (%)</i>	1 (10)	1 (9,09)
Bachelor, <i>n (%)</i>	3 (30)	8 (72,72)
Master, <i>n (%)</i>	3 (30)	0 (0)
Doctoral, <i>n (%)</i>	1 (10)	1 (9,09)

Descriptive analysis of the change in posttraumatic growth score shows that on average pretest score, posttraumatic growth in the control group (83,91) is higher than the experimental group (70,00). Furthermore, the average scores of posttraumatic growth at posttest 1 and posttest two changes. The average score of posttraumatic growth in the experimental group (84,40) becomes higher than the

control group (84,18) at posttest 1. The change becomes more apparent in posttest 2, the average score of posttraumatic growth in the experimental group (88,70) is becoming significantly different from the control group (78,00). The standard deviation of the control group (SDpre=10,653, SDpost1=12,750, SDpost2=13,682) is greater than the experimental group (SDpre=10,220, SDpost1=10,157, SDpost2=11,314). It can be seen in Figure 1.

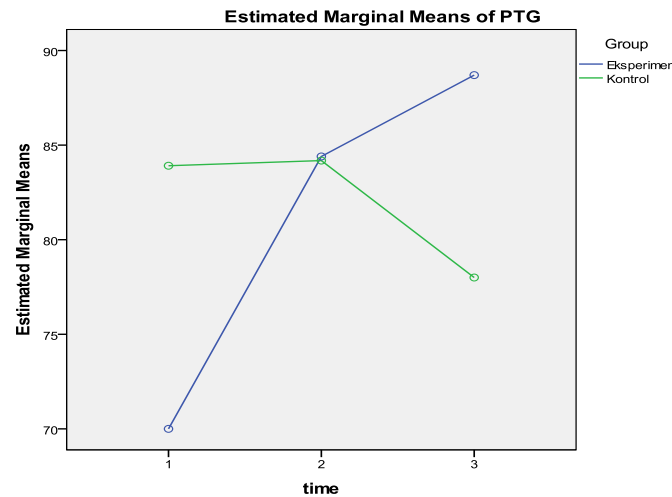


Figure 1 Changes in Score

Based on the data processing using Anova Mixed Design, the value of  $F = 26,040$  ( $p = 0,000$ ,  $p < 0,05$ ) means that there is the interaction between time (pre-test, post-test 1, and posttest 2) and groups (experiment and control group). Interaction shows that the change in pretest score toward post-test in both groups (experimental and control group) is significantly different. It can be seen in Table 2.

Table 2 Tests of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
time *	Sphericity Assumed	1597,716	2	798,858	26,040	0,000	0,578
Group	Greenhouse-Geisser	1597,716	1,621	985,919	26,040	0,000	0,578
	Huynh-Feldt	1597,716	1,843	866,886	26,040	0,000	0,578
	Lower-bound	1597,716	1,000	1597,716	26,040	0,000	0,578

Results of Pairwise comparisons show that the changes of posttraumatic growth in the experimental group are significant ( $MD = -14,400$ ;  $p = 0,000$ ,  $p < 0,05$ ). In contrast to posttraumatic growth changes in the control group that are not significant ( $MD = -0,273$ ,  $p = 0,914$ ,  $p > 0,05$ ). This suggests that an intervention such as mindfulness training in the experimental group is effective in promoting posttraumatic growth.

The results of multivariate tests in Table 3 show the increasing capacity of posttraumatic growth on the subjects. The results in the experimental group show that the intervention provided, that is mindfulness training, successfully increases posttraumatic growth in cancer patients by 69,1%. In contrast, the control group which is not given intervention in the same period only has an increase of 4,08% in posttraumatic growth.

Table 3 Testing of Hypothesis: Pairwise Comparisons and Multivariate Tests

	Experiment	Control
Pairwise comparisons		
Mean Difference	-14,400	-0,273
Sig.	0,000	0,914
Multivariate tests		
Sig.	0,000	0,009
Partial Eta Squared	0,691	0,408

Based on the analysis, it is found that cancer patients in the adult age range tend to have a higher post-traumatic growth score than those in the early adult age group. This occurs in the experimental and control groups. The average post-traumatic growth score of pretest, post-test 1, and posttest 2 are accumulated showing higher results in the middle-aged adults that range from 41 to 60 years. It can be seen in Table 4.

Table 4 Analysis of Age Categories

The Average of Posttraumatic Growth Score	
Experimental	
Early adult	80,66667
Middle aged	81,27778
Control	
Early adult	80,41667
Middle aged	82,14286

Another additional finding relates to the most developed dimension of posttraumatic growth. Based on the analysis performed, the aspect that has the highest score is spirituality and appreciation of life, while the aspect that has the lowest score is a new possibility. It can be seen in Table 5.

Table 5 The Average Analysis Scores of Every Aspect of Posttraumatic Growth

	Parameter	A1	A2	A3	A4	A5
Experiment	Pretest	3,29	3,32	3,275	3,7	3,3
	Posttest 1	3,93	3,94	4,1	4,2	4,13
	Posttest 2	4,13	4,12	4,28	4,4	4,43
Control	Pretest	4,33	4,2	4,32	4,7	4,57
	Posttest 1	4,34	4,2	4,3	4,7	4,6
	Posttest 2	4,09	3,76	4,15	4,3	4,3

- A1: Relating to others
- A2: New possibility
- A3: Personal strength
- A4: Spirituality
- A5: Life appreciation

The result of the study is in line with the results of research conducted by Garland and colleagues in 2007. It is said that the mindfulness-based intervention could facilitate the emergence of posttraumatic growth. Through mindfulness exercises, individuals learn to appreciate every moment they have and rebuild schemes that have been destroyed during the trauma. Mindfulness has been shown to cause significant changes in the brain. The basic mechanism of posttraumatic growth is demolishing maladaptive frames and establishing a more adaptive frame, centered on pure awareness of the present and acceptance. Individuals who have a better mindfulness level may be more likely to

embrace high personal consciousness as well as cognitive framing skills that are important for the development of positive outcome.

There are three key components of mindfulness; intention, attention, and attitude. Interaction of intention, attention, and attitude lead to the development of a meta-mechanism called reperceiving. Reperceiving is a shift in perspective, such as being able to be an observer of experience and process. Thus, the individual can separate himself from his experience. Reperceiving encourages individuals to deeper and more intimately pass through every moment. Reperceiving resembles a developmental process that causes individuals to have better recognition. Attention and awareness of the current moments help facilitate reperceiving for reality. The reperceiving mechanism in mindfulness allows individuals to tolerate the difficult emotions that happened (Shapiro *et al.*, 2006).

Mindfulness means developing a non-judgmental awareness of an object. Mindfulness based interventions are potential mental health instruments (Soons *et al.*, 2010). More mindful individuals report less negative mood after the conflict occurs (Burke, 2009). Mindfulness is a simple and easy way that can greatly help individuals through tough times and difficulties. Mindfulness is a skill that allows individuals to become less reactive about what is happening right now. It is a way to connect to all events, positively, negatively, and neutrally. Not judging fosters the development of mindfulness. Therefore, when the individuals are faced with difficult physical and emotional conditions, it encourages them to see things more clearly according to the actual conditions (Germer *et al.*, 2005).

Developing mindfulness through contemplative practice can have important implications for the population in general, especially for individuals susceptible to exposure to traumatic life events (Hanley *et al.*, 2015). Mindfulness can increase awareness and flexibility in responding to the emotional experience which helps individuals understand the thoughts and feelings that may have been avoided after experiencing trauma. Mindfulness teaches individuals to pay attention to thoughts and feelings without having to act to change them. Mindfulness exercises involve the heart and mind. Mindfulness exercises instruct individuals to be present and identify thoughts, feelings, and memories. Mindfulness-based intervention by passed the avoidance of behavioral leap, increased attention, and rising meaningful behavior that often suffered deficits in individuals with a history of trauma. Approach to mindfulness-based intervention can be used to facilitate regulation of emotion and acceptance. Based on this, the mindfulness-based intervention is essential to help victims overcome the trauma more effectively. Individuals with a greater capacity of mindfulness have a low probability to fall into a pattern of avoidance as a result of trauma (Follette *et al.*, 2006).

Individuals who are given a mindfulness-based intervention may improve the ability to identify and appreciate the spiritual resources. Mindfulness-based interventions are also beneficial to increase connection with others, the quality of gratitude, compassion, and equanimity. In this regard, it is known that spirituality, connection with others, quality of gratitude, compassion, and equanimity are the dimensions related to posttraumatic growth (Garland *et al.*, 2007).

The success of mindfulness-based training provided in this study is also not quitting the exercise session after the training. Routine exercise sessions for seven days after formal training give myriad benefits to the subject. Overall, the conduct of mindfulness exercises helps the subject feel calm and more responsive. On the other side, additional findings show that cancer patients who are in the range of middle age (41 to 60 years) are more likely to have higher scores of posttraumatic growth. It can be seen from a comparison of the average scores of posttraumatic growth among early adult age groups (18 to 40 years) and middle age (41 to 60 years). This is related to the task in the development phase of life. Early adulthood is a period of adjustment for the individuals to cope with their own problems in life, whereas during middle adulthood, individuals are able to accept and adapt to social and physiological changes that occur.



Related to the most developed aspects or dimensions of posttraumatic growth, it is found to be the same aspect in the experimental group and the control group. Aspect or dimension of spirituality has the highest score in pre-test and post-test 1 in both the experimental and control groups. In posttest 2, the highest aspect of the experimental and the control group is the appreciation of life and spirituality. This suggests that the growth most likely occurs in the area of spirituality and appreciation of life. Similar findings occur in the experimental group and the control, which means that the accorded treatment stimulates growth in the same area. This may happen because the people in Indonesia or South Sulawesi, in particular, is born and developed in a culture that upholds the values of religiosity. In keeping with that, a very religious individual is potentially able to experience growth in the realm of spirituality (Tedeschi & Calhoun, 2004).

The dimension of posttraumatic growth that has the lowest score both in the experimental and control group is the new possibility. This can occur because although the subjects' spiritual matter has a high value, they may be less open to discovering new interests. Consequently, they may be unaware that they have discovered a new choice in life. In fact, individuals who successfully fought the face of adversity tend to find new options in one or more domains in life (Lindstrom, Cann, Calhoun, & Tedeschi, 2013).

## CONCLUSIONS

A brief mindfulness-based intervention is effective to promote posttraumatic growth in cancer patients. Changes that occur before and after the administration of mindfulness-based interventions show a significant result. Mindfulness-based interventions are given to the experimental group manage to increase posttraumatic growth on the subject amounting to 69,1%. The results are obtained with the note that the subjects conduct mindfulness exercise routine every day for one week.

For further research, it is expected to design a study that can compare the effectiveness of a brief mindfulness based intervention with other types of interventions. Thus, the pure effectiveness of a brief mindfulness based intervention can be better known. Furthermore, further researchers are expected to collect research subjects with greater amounts over longer time spans. In order to provide more visible results in term of the changes in dynamics of posttraumatic growth in cancer patients, time series design may need to be done in the future.

Comparison between men and women will be very useful to do next. It is intended to determine the effect of gender in mindfulness-based interventions. In addition, mix method research model may be done to dig the information qualitatively and not just based on the numbers. Hence, the obtained picture can be more clear and descriptive.

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