Original Article

Determining Mindfulness and Posttraumatic Growth Levels of Individuals Diagnosed with Cancer: A Cross-Sectional Study

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Abstract
Objective: The aim of this study was to examine the relationship between mindfulness on posttraumatic growth levels in individuals with cancer.
Method: This cross-sectional study was conducted with 304 individuals diagnosed with cancer who were treated in the oncology service of a training and research hospital between January and September 2022. Data were collected using the Mindfulness Attention Awareness Scale (MAAS) and the Posttraumatic Growth Inventory (PTGI).
Results: Of the participants, 21.7% were diagnosed with breast cancer. The mean total score of the participants was 58.77±13.89 on MAAS and 68.18±19.82 on PTGI. A strong positive significant correlation was found between the mean total MAAS score and the mean total PTGI score ($r=.788$, $p< .001$). The mindfulness had an effect of 62% on posttraumatic growth ($R^2=.620$, $p< .001$). It was found that individuals with a hematological cancer diagnosis, individuals with 11 years and above, and individuals with Stage IV were found to have lower mindfulness and posttraumatic growth levels than other groups.
Conclusion: It was determined that individuals diagnosed with cancer had moderate levels of mindfulness and posttraumatic growth and that individuals with a high mindfulness level experienced posttraumatic growth more. Comprehensive psychosocial interventions are recommended for individuals diagnosed with cancer, especially those diagnosed with hematological cancer.

Keywords: cancer, mindfulness, posttraumatic growth, holistic care.

Introduction

The number of individuals diagnosed with cancer in the world and those who lost their lives due to cancer is increasing day by day. Cancer, which seriously affects the quality of life, is a disease with a high mortality and morbidity rate (Uzar-Ozcetin and Hicdurmaz, 2019). According to the data of the Ministry of Health in Turkey, cancer ranks second among the causes of death and constitutes approximately 20% of the annual deaths in the country, and this rate increases every year (Ministry of Health, 2024).

Cancer is a multisymptomatic disease that affects individuals physically, mentally, socially, and emotionally (Simsek, 2018). Previous studies have reported that approximately half of the individuals diagnosed with cancer experience various mental problems. In the meta-analysis of Fortin et al., (2021), it was determined that 39% of individuals diagnosed with cancer experienced stress, that 34% had anxiety, that 31% had

posttraumatic stress disorder (PTSD), and that 20% had depression. In the study conducted by Cordova et al. (2017), it was reported that 15% of individuals had PTSD symptoms following the diagnosis of cancer. Being diagnosed with a serious disease such as cancer is a traumatic process for individuals and individuals need psychiatric support in this process. However, it has been reported that individuals who can effectively cope with traumatic processes experience posttraumatic growth (Calhoun and Tedeschi, 2014; Uzar-Ozcetin and Hicdurmaz, 2019). People who have grown after trauma have positive changes in life and some changes in the philosophy of life (Calhoun and Tedeschi, 2014). It is also seen that they determine their priorities in life or they tend to spirituality more (Prieto-Ursúa and Jódar, 2020). It has been reported in the literature that various factors such as mindfulness (Walsh et al., 2018) positively affect posttraumatic growth in individuals diagnosed with cancer.

The concept of mindfulness has been emphasized more in recent years and advocates paying attention to and noticing the returns of the moment experienced in a certain route by avoiding judgments as much as possible (Aktepe & Tolan, 2020). Third-wave therapies, which are frequently applied today, focus on mindfulness and these psychosocial interventions aim to increase the mindfulness levels of individuals (Chang et al., 2021; Mehta et al., 2019). In studies evaluating the effects of mindfulness in individuals with cancer, it was determined that patients with high mindfulness levels had lower levels of stress, anxiety, depression, fatigue, and pain, self-sufficiency and that adaptation to the disease was easier (Chang et al., 2021; Haji Seyed Javadi et al., 2018; Johannsen et al., 2016; Kenne Sarenmalm et al., 2017; Mehta et al., 2019). In these international studies, the effects of mindfulness on many important life areas in individuals with cancer are seen. However, when the national literature is scanned, it is seen that the mindfulness levels of individuals diagnosed with cancer and the effects of mindfulness on which areas of life are not fully revealed by studies. The two important concepts for individuals with cancer, mindfulness and post-trauma growth levels have not been found in our country, Turkey. Therefore, this study aimed to examine the effect of mindfulness on posttraumatic growth levels in individuals diagnosed with cancer. The study will provide significant and up-to-date data to the literature and will enlighten psychosocial interventions that can be applied by mental health professionals to individuals diagnosed with cancer.

Method

Design: This study is cross-sectional, descriptive and correlational.

Participants: This study conducted with 565 individuals diagnosed with cancer who were hospitalized in the oncology unit and received outpatient day treatment in the chemotherapy unit of a training and research hospital in the Eastern Anatolia region of Turkey and between January-September 2022. The sample size calculated using the formula for a known population was determined as 229 individuals with a confidence interval of 95% and a margin of error of 5%. The data collection process was completed with 304 individuals diagnosed with cancer who met the inclusion criteria in the study. During this process, no one left the research for any reason or filled in incomplete forms.

Inclusion criteria of the study; age of 18 years and above, diagnosed with cancer, were having a health condition that did not prevent communication and willingness to participate in the study.

Ethical Consideration: In this study, researchers stated that they comply Declaration of Helsinki. Before the study was carried out, the ethics committee approval was obtained from the Ataturk University Faculty of Medicine Clinical Research Ethics Committee **Number:** 09/19, **Dated**: 30.12.2021 and institutional permission from the managers of the institution and clinic where the study was to be conducted. The study was conducted in compliance with the Law on the Protection of Personal Data. Written informed consent was obtained the individuals.

Data Collection Tools: In this study, the data were collected from the participating individuals by the researcher through face-to-

face interviews between January-September 2022. Data were collected using the Information Form, Mindfulness Attention Awareness Scale (MAAS) and Posttraumatic Growth Inventory (PTGI).

Information Form: In this study, a personal information form developed by the researchers in line with the literature was used to collect the data on the sociodemographic characteristics and health status of the participants (Dehghan et al., 2020; Liu et al., 2014; Simsek, 2018). The form consists of two parts: The sociodemographic data section comprises of six items questioning the participants' characteristics such as age, sex, educational status, and marital status. The health status section consists of five items questioning information such as the type of cancer, stage of disease, and duration of the treatment etc.

Mindfulness Attention Awareness Scale (MAAS): The scale was developed by Brown and Ryan (2003) to measure the general tendency to be aware of and pay attention to moment experiences in daily life and adapted to Turkish by Ozyesil et al., (2011). The scale, which consists of a total of 15 items, has a 6-point Likert type response range (from 1=almost always to 6=almost never) and a single-factor structure. The score obtainable from the scale ranges between 15-90 and a high score on the scale means a high mindfulness level. In the Turkish validity and reliability study of the scale, the Cronbach alpha coefficient was 0.80 (Ozyesil et al., 2011). In this study, the Cronbach alpha coefficient of the scale was determined to be 0.95.

Posttraumatic Growth Inventory (PTGI): The scale was developed by Tedeschi and Calhoun (2017) in order to measure perceived psychological growth after traumatic experiences and adapted to Turkish by Kagan et al., (2012). It consists of three subscales: "Changes in Self-perception", "Change in Philosophy of Life", and "Change in Relationships". The scale, which consists of a total of 21 items and has s 6-point Likert-type response scale (0= 'As a result of a stressful event(s), I have never experienced this change' and 5= 'As a result of a stressful event(s), I have experienced this change to a great extent'). The score obtainable from the scale ranges between 0-105. The scale does not have a cut-off point or a reverse item. A high score on the scale indicates a high posttraumatic growth level. In the Turkish validity and reliability study of the scale, the Cronbach alpha coefficient was .92 (Kagan et al., 2012). In this study, the Cronbach alpha coefficient of the scale was determined to be .97.

Data analysis: The data obtained from the research were evaluated in the SPSS 22.0 (IBM Corp, Armonk, NY) package program. In the analysis of the descriptive data; number, percentages, mean, standard deviation, and minimum and maximum values were used. Data are accepted to have normal distribution if the skewness and kurtosis values are between -2 and +2 (George & Mallery, 2010). The data have normal distribution. Student's t-test, and ANOVA were used in comparisons of scale items; Simple Linear regression analysis and Pearson correlation analysis were used to determine the relationship between the scales. In the regression analysis, the effect of the mindfulness levels of the patients on their posttraumatic growth levels was evaluated and a model was created in this direction. In the model, the effect of the total MAAS score on the total and subscale scores of PTGI was examined separately. In this context, the total PTGI score and subscale scores were taken as the dependent variables and the total MAAS score was the independent variable. All the data were tested at the significance level of $p<0.05$.

Results

The mean age of the individuals was 54.13±11.15. Of the participants, 55.3% were female, 78.3% were married, 77.3% lived with their spouses and children, and 57.6% were not employed in any job. In terms of distribution according to health characteristics, 21.7% of the participants were diagnosed with breast cancer, 20.1% were diagnosed with gastrointestinal system cancer (esophagus, stomach cancer etc.) and received treatment for 4.02±3.62 years, 43.5% were at Stage-II, 98% received support from their families during the disease process, and 58.6% had no family history of cancer (Table 1).

The total MAAS score of the participants was 58.77±13.89. The mean scores were 34.93±9.83 on the PTGI Changes in self-perception subscale, 17.80±6.17 on the Changes in philosophy of life subscale, and 17.79±4.41 on the Changes in relationship subscale. The mean total PTGI score was 68.18±19.82 (Table 2).

In terms of the relationship between the participants' mean MAAS and PTGI scores, there was a strong positive significant correlation between the mean scores on changes in self-perception and changes in philosophy of life subscales and total PTGI and the mean total MAAS score. There was a very strong positive significant correlation between the PTGI changes in relationship subscale and the mean total MAAS score ($p< .001$). As a result of the regression analysis, it was determined that the total MAAS score had an effect of 82% on the changes in relationship subscale, an effect of 62% on the total PTGI score, an effect of 60.7% on the changes in philosophy of life subscale, and an effect of 55.8% on the changes in self-perception subscale (Table 3).

Comparisons of the patients' mean scale scores based on sociodemographic and health characteristics revealed significant differences in mean total MAAS scores and PTGI all subscale and total scores according to age range, type of cancer, disease stage and duration from the first diagnosis ($p< .05$) (Table 4).

Table 1. Patients Characteristics (n=304)

Characteristic	Min-Max	X(*SD*)
Age (years)	23-80	54.13(11.15)
Duration from the first diagnosis (year)	1-17	4.02(3.62)
	Number	**%**
Age range		
18-35	21	6.9
36-50	92	30.3
51-65	143	**47.0**
66-80	48	15.8
Gender		
Female	168	**55.3**
Male	136	44.7
Marital status		
Married	238	**78.3**
Unmarried	66	21.7
Education level		
Primary/Secondary	163	**53.6**
High School	109	35.9
University	32	10.5
Type of cancer		
Breast cancer	66	**21.7**
Lung cancer	25	8.2
Colorectal cancer	26	8.6
Brain cancer	7	2.3

Gynecological cancers	16	5.3
Urinary system cancers	53	17.4
Head and neck cancers	26	8.6
Gastrointestinal system cancers	61	20.1
Hematological cancers	14	4.6
Hepatobiliary system cancers	6	2.0
Skin cancer	4	1.3
Disease stage		
Stage I	36	11.8
Stage II	132	**43.5**
Stage III	118	38.8
Stage IV	18	5.9
Duration from the first diagnosis		
6 month-1 year	87	**28.6**
2 year	63	20.7
3- 5 year	79	26.0
6-10 year	52	17.1
11 year+	23	7.6
Person who supports the treatment process*		
Family	298	**98.0**
Friends	249	81.9
Health professional	151	49.7
Support groups/volunteers	33	10.9
Presence of a family history of cancer		
Yes	126	41.4
No	178	**58.6**

X=Mean; SD=Standard Deviation; *=More than one option is marked.

Table 2. Mean MAAS and PTGI Scores of the Patients

Scales		**Min-Max**	**X(*SD*)**
MAAS	**Total**	28-86	58.77(13.89)
PTGI	Changes in self perception	7-50	34.93(9.83)
	Changes in philosophy of life	2-29	17.80(6.17)
	Changes in relationship	4-25	17.79(4.41)
	Total	13-100	68.18(19.8)

X=Mean; SD=Standard Deviation; MAAS=Mindfulness Attention Awareness Scale; PTGI=Posttraumatic Growth Inventory.

Table 3. The scales of MAAS and PTGI with correlation and regression analyses

Scales	MAAS							
	Regression						Correlation	
PTGI	B	St error	R^2	t	F	p	r	p
Changes in self perception*	0.529	0.027	0.558	19.521	381.060	0.000	0.747**	**0.000**
Changes in philosophy of life*	0.349	0.016	0.607	21.576	465.529	0.000	0.779**	**0.000**
Changes in relationship*	0.288	0.008	0.820	37.057	1373.240	0.000	0.905**	**0.000**
Total*	1.124	0.051	0.620	22.218	493.652	0.000	0.788**	**0.000**

MAAS=Mindfulness Attention Awareness Scale; PTGI=Posttraumatic Growth Inventory;
*=Dependent Variables; **=Correlation is significant at the 0.01 level (2-tailed).

Table 4. Comparison of Patients' Mean MAAS and PTGI Scores According to Sociodemographic and Health Characteristics

Characteristic	n	MAAS	PTGI			
		Total	Changes in self perception	Changes in philosophy of life	Changes in relationship	Total
		X(*SD*)	X(*SD*)	X(*SD*)	X(*SD*)	X(*SD*)
Age range						
18-35[a]	21	46.85(10.49)	27.00(11.42)	12.71(6.79)	13.85 (4.04)	51.28(22.29)
36-50[b]	92	58.23(13.72)	34.77(10.07)	17.92(6.63)	17.55(4.43)	68.04(20.44)
51-65[c]	143	60.86(13.90)	35.83(9.32)	18.43(5.66)	18.35(4.33)	70.04(18.73)
66-80[d]	48	58.77(13.08)	36.02(8.74)	17.91(5.56)	18.29(3.91)	70.27(17.57)
Test	***F***	**6.630**	**5.392**	**5.505**	**7.035**	**5.968**
	p	**0.001**	**0.001**	**0.001**	**0.000**	**0.001**
Post-hoc		**a<b, c, d**	**a<b, c, d**	**a<b, c, d**	**a<b, c, d**	**a<b, c, d**
Gender						
Female	168	57.94(14.68)	34.57(10.17)	17.69(6.65)	17.72(4.62)	67.88(20.76)
Male	136	59.80(12.82)	35.38(9.40)	17.93(5.54)	17.87(4.14)	68.55(18.66)
Test	***t***	1.179	-0.715	-0.333	-0.292	-0.293
	p	0.239	0.475	0.756	0.765	0.770
Marital status						
Married	238	58.93(13.51)	35.39(9.31)	17.95(5.78)	17.96(4.30)	69.0(18.72)

Unmarried	66	58.19(15.26)	33.27(11.42)	17.24(7.43)	17.16(4.75)	65.01(23.24)
Test	***t***	0.380	1.387	0.723	1.304	1.301
	p	0.741	0.176	0.471	0.193	0.197
Education level						
Primary/Secondary	163	57.36(14.08)	33.97(9.81)	17.05(6.13)	17.56(4.25)	66.43(19.65)
High School	109	59.56(13.65)	34.43(10.00)	17.33(6.09)	17.62(4.45)	66.77(19.87)
University	32	61.12(14.54)	37.03(10.53)	19.71(6.57)	18.37(4.91)	72.46(21.79)
Test	***F***	0.748	1.007	1.921	0.337	1.134
	p	0.526	0.390	0.126	0.716	0.336
Type of cancer						
Breast cancer[a]	66	60.90(15.42)	37.12(9.89)	19.77(6.07)	18.56(4.88)	73.51(19.86)
Lung cancer[b]	25	56.80(12.60)	32.48(9.14)	17.04(5.23)	17.44(4.19)	64.12(18.21)
Colorectal cancer[c]	26	55.53(13.14)	31.34(9.45)	15.69(6.05)	17.26(3.61)	61.8819.08
Brain cancer[d]	7	60.85(15.67)	31.14(11.90)	17.14(7.17)	16.28(5.21)	62.57(23.95)
Gynecological cancer[e]	16	58.31(12.66)	36.81(7.81)	17.75 (5.56)	17.75(3.92)	69.25(15.99)
Urinary system cancer[f]	53	62.22(12.55)	38.30(7.17)	19.35(4.39)	18.84(3.53)	74.01(14.26)
Head and neck cancer[g]	26	62.00(12.10)	36.34(9.22)	18.69(6.57)	18.50(4.30)	71.38(19.93)
Gastrointestinal system cancer[h]	61	57.81(13.59)	35.14(9.84)	17.40(6.37)	17.78(4.37)	67.96(20.18)
Hematological cancer[i]	14	45.50(12.14)	24.42(11.86)	10.35(7.01)	13.42(4.60)	45.92(23.19)
Hepatobiliary system cancer[j]	6	53.16(16.46)	24.16(8.35)	13.83(5.63)	14.66(5.27)	49.83(17.35)
Skin cancer[k]	4	57.75(12.03)	32.50(8.88)	16.75(4.50)	15.00(3.36)	62.50(16.94)
Test	***F***	**2.339**	**4.473**	**4.177**	**2.675**	**4.113**
	p	**0.011**	**0.000**	**0.000**	**0.004**	**0.000**
Post-hoc		**i<a,f,g**	**i<a,e,f,g,h**	**i<a,e,f,g,h**	**i<a,f,g,h**	**i<a,e,f,g,h** **j<f**
Disease stage						
Stage I[a]	36	62.83(15.16)	33.05(10.26)	17.72(6.53)	19.27(4.45)	67.22(21.48)
Stage II[b]	132	64.27(13.23)	39.08(7.97)	20.25(4.97)	19.47(3.77)	76.25(15.83)
Stage III[c]	118	62.00(13.19)	36.3(8.64)	18.38(5.57)	18.82(4.13)	71.00(17.67)

Stage IV[d]	18	53.83(13.02)	32.79(10.70)	16.62(6.69)	16.21(4.33)	63.59(21.36)
Test	***F***	**11.092**	**5.485**	**3.967**	**11.233**	**5.381**
	p	**0.000**	**0.001**	**0.009**	**0.000**	**0.001**
Post-hoc		**d<a,b,c**	**d<b,c**	**d<b,c**	**d<a,b,c**	**d<b,c**
Duration from the first diagnosis						
6 months-1 year[a]	87	63.19(13.44)	37.28(8.72)	19.26(5.38)	19.55(3.95)	73.50(17.59)
2 year[b]	63	58.80(14.18)	35.25(9.14)	18.34(5.62)	17.60(4.12)	68.73(17.80)
3- 5 year[c]	79	61.91(12.89)	36.56(8.98)	18.64(5.58)	18.82(3.99)	71.74(17.86)
6-10 year[d]	52	62.43(14.18)	36.17(8.61)	18.60(6.14)	19.04(4.40)	71.30(18.85)
11 year+[e]	23	52.28(12.57)	31.48(11.15)	15.55(6.99)	15.60(4.41)	60.54(22.39)
Test	***F***	**8.172**	**4.257**	**4.403**	**10.042**	**5.239**
	p	**0.000**	**0.002**	**0.002**	**0.000**	**0.000**
Post-hoc		**e<a,b,c,d**	**e<a,c,d**	**e<a,c,d**	**e<a,b,c,d**	**e<a,c,d**

X=Mean; SD=Standard Deviation; MAAS=Mindfulness Attention Awareness Scale; PTGI=Posttraumatic Growth Inventory; F=One-Way ANOVA; Post hoc test=Bonferroni; t=Student's t-test.

Discussion

In the present study, the effect of mindfulness levels on posttraumatic growth levels in individuals diagnosed with cancer was evaluated. As a result, it was found that mindfulness and posttraumatic growth levels of the individuals were moderate and that there was a positive and significant correlation between mindfulness and posttraumatic growth levels. Mindfulness was found to have an effect on posttraumatic growth level by 60.7 %. It was found that individuals with hematological cancer diagnosis, individuals with 11 years and above, and individuals with Stage IV were found to be lower mindfulness and posttraumatic growth levels than other groups.

The mindfulness levels of the individuals participating in this study were moderate. In the study conducted by Dehghan et al., (2020), it was determined that the mindfulness levels of individuals diagnosed with cancer were high. In their study, Hsieh et al. (2019), it was found that the levels of mindfulness of lung cancer diagnosed individuals were high. In the study conducted by Ariturk (2021), it was reported that the mindfulness levels of individuals with breast cancer were moderate before the mindfulness-based cognitive therapy (MBCT) program and increased significantly after the intervention and that this increase in the mindfulness level remained in the 3rd-month follow-up. In studies conducted in different countries, it can be said that the mindfulness levels of cancer patients are at different levels and that the mindfulness levels of the patients in our country are low compared to international studies. In previous studies (Ariturk, 2021; Dehghan, 2020; Hsieh, 2019), it was determined that individuals' adaptation to disease, self-compassion, quality of life, depression, and stress levels also got better with the increase in mindfulness levels. Such psychosocial interventions not only increase the

mindfulness levels of individuals diagnosed with cancer but also benefit many areas of their lives. It can be suggested that it is important to apply psychosocial interventions to individuals diagnosed with cancer and that these interventions should be repeated at regular intervals in order to maintain the positive effects of the interventions for the long term. It can be said that studies on supporting individuals with cancer with psychosocial interventions should be increased in our country, Turkey. Thus, individuals can have an easier treatment process and more productive life.

In the current study, it was found that the posttraumatic growth levels of individuals diagnosed with cancer were moderate. In the study conducted by Zebrack et al., (2015), it was determined that the posttraumatic growth levels of adolescents and young adults diagnosed with cancer were moderate. Likewise, in their study, Smith et al. (2014) determined that the posttraumatic growth levels of individuals with lymphoma were moderate and Liegey Dougall et al., (2017), determined that the posttraumatic growth levels of individuals with lung cancer were moderate. Similar findings were reported in the study conducted by Simsek (2018) in Turkey and it was stated that the posttraumatic growth level is moderate in individuals with cancer. The concept of posttraumatic growth states that individuals effectively cope with a crisis and then experience a positive change in their lives, therefore, the level of posttraumatic growth is desired to be high in an individual with a serious diagnosis such as cancer. Posttraumatic growth helps to better cope with disease problems and treatment process, and accordingly, can increase the compliance to the disease and treatment process and quality of life of individuals diagnosed with cancer who are at risk (Zebrack et al., 2015). In previous studies (Simsek, 2018; Zebrack et al., 2015), it was determined that factors such as the presence of social support and low levels of stress positively affect the posttraumatic growth levels of individuals with cancer. In addition, it is known that the religious and spiritual aspects of the people living in the region where the study was conducted are high. It has been reported in studies that religion and spirituality have a positive effect on posttraumatic growth (Prieto-Ursúa & Jódar, 2020; Sahin Altun et al., 2022). For this reason, it can be said that the religious and cultural elements of our country, Turkey, have a positive effect on the posttraumatic growth levels of individuals. It can be ensured that individuals can come out of their disease processes by experiencing a positive change by taking into account the activities such as fulfilling the activities appropriate to their religious beliefs, praying, meeting with their family and friends in nursing care.

In the present study, it was found that there was a strong positive significant correlation between mindfulness and posttraumatic growth levels of individuals diagnosed with cancer. In addition, it was determined that mindfulness had a 60.7 % effect on posttraumatic growth levels. There is no study on this subject in the national literature whereas a limited number of studies are available in the international literature. In studies conducted by Omid et al. (2017) and Lianchao and Tingting (2020), it was found that there is a positive and significant correlation between mindfulness and posttraumatic growth levels of individuals diagnosed with cancer. Hanley et al. (2015) reported that mindfulness is an important predictor of posttraumatic growth in individuals diagnosed with cancer. In this study, similar findings were obtained. Zhong et al. (2019), determined that there is a positive and significant correlation between meaning of life and mindfulness. Furthermore, in this study, it was determined that mindfulness had a high effect of 82% on the Changes in relationship subscale. It has been stated that a high mindfulness level is a protective factor for individuals, that psychological problems such as distress, depression, and anxiety are less common in individuals, and that it leads to emotional control and positive behavioral changes (Nitzan-Assayag et al., 2015). In this context, it can be suggested that it can reflect positively on the individual's interpersonal relations, as in this study. Moreover, prevention or intervention strategies in the early stages to reduce the risk following traumatic events can lead to effective behavioral changes by raising awareness of the individual about him/herself

and his/her conditions. Thus, it can be interpreted that individuals diagnosed with cancer with a high mindfulness level can experience a higher level of posttraumatic growth.

Moreover, in the present study, it was found that individuals who were between the ages of 18-35 were lower than individuals aged 36-80 years old. In the studies, there is no significant relationship between age and mindfulness levels (Al-Ghabeesh et al., 2019; Branstrom et al., 2011; Dehghan et al., 2020; Fong and Ho, 2020). It is reported that there is a negative relationship between the concepts of growth after age and trauma (Cordova et al., 2017; Kinali 2020). For this study, it can be interpreted that individuals who are diagnosed with cancer at a young age were more mentally affected and due to it is adversely affected by mindfulness and posttraumatic growth levels. In addition, it is reported that as the age increases, it is reported that its spirituality increases (Kamijo & Miyamura, 2020; Tasan 2020), which may lead to a higher level of growth levels of older individuals.

In this study, it was found that individuals with hematological cancer were lower than diagnosed as breast cancer, urinary system cancer, head and neck cancer, gastrointestinal system cancer. In studies conducted with individuals with different types of cancer, it is stated that any type of cancer is not a significant relationship between mindfulness and posttraumatic growth levels (Dehghan et al., 2020; Simsek 2018). In this study, the levels of mindfulness and posttraumatic growth after were significantly lower than other types of cancer of hematological cancer. In line with this finding, it is understood that individuals with hematological cancer in Turkey are more adversely affected in the diagnostic and treatment processes and that more comprehensive interventions should be made to the individual diagnosed with cancer. Hematological cancer-diagnosed individuals should be referred to consultation-liaison psychiatry services in the earliest period in the treatment processes.

In this study, it was found that individuals in Stage IV were lower than individuals with mindfulness and posttraumatic growth levels in Stage I-II-III. In the study, Smith et al. (2014), the posttraumatic growth levels of individuals with Stage I in lymphoma diagnosed individuals have higher levels of growth; in the study of Liu et al. (2014), it was determined that early breast cancer diagnosed individuals have higher posttraumatic growth levels and PTSD symptoms were lower. In the meta-analysis study, Marziliano et al.(2020), of the cancer, the posttraumatic growth level in the Stage I; in Stage IV, PTSD was found to be higher. The reason for this is that patients are diagnosed in the early period of the disease and individuals can get rid of the disease with treatment. This stage may not traumatically force individuals. However, individuals who are in the late stage of cancer such as Stage III-IV experience their symptoms more severe and are exposed to a more intense and long treatment program. This is a process of both physical and mental wear for individuals, and individuals seek ways to cope with this challenging process. At this point, activities such as praying and meditation with the role of cultural factors of our country, Turkey, may relieve individuals during this period, and individuals may have played a role in the higher levels of mindfulness and post - traumatic growth levels in late stages.

In this study, it was found that individuals with diagnosis for 11 years and above were lower than the diagnosed individuals with 10 years and below. There are different results in the literature. While some studies found that posttraumatic growth was higher when the time after diagnosis was low (Gianinazzi et al., 2016; Yi and Kim, 2014; Zhang et al., 2019); others found that the length of time after diagnosis was positively associated with posttraumatic growth (Aflakseir et al., 2016; Danhauer et al., 2013). In this study found that posttraumatic growth was higher when the time after diagnosis was low. It can be said that variables such as the difficulties experienced by patients, the treatment/prognosis process on these different results are effective.

However, after the diagnosis, as recurrences and the duration of the disease prolongs, individuals may wear out and lose hope. This may adversely affect the individual's mindfulness and posttraumatic growth levels.

Conclusion: In the present study, it was concluded that the mindfulness and posttraumatic growth levels of individuals diagnosed with cancer were moderate and that there was a positive significant correlation between mindfulness and posttraumatic growth levels. It was demonstrated that mindfulness had a great effect on the posttraumatic growth. It was found that individuals with hematological cancer diagnosis, individuals with 11 years and above, and individuals with Stage-IV were found to be lower mindfulness and posttraumatic growth levels than other groups.

Implications for Nursing Practice: Individuals diagnosed with cancer try to cope with long treatment processes and relapses and are adversely affected psychologically. It is an important task of health professionals to help individuals cope with a difficult process such as cancer effectively and complete this process with positive changes. Nurses who spend the most time with individuals diagnosed with cancer should follow individuals in terms of mental disorders and provide holistic care. These individuals should be directed to consultation-liaison psychiatry services in the early period and comprehensively benefit from mental health services. Consultation-liaison psychiatry services should be expanded in our country, Turkey, and individuals diagnosed with cancer should benefit from these services more comprehensively. Especially with the application of mindfulness-based therapies in psychosocial interventions, individuals can come out of this difficult process with improvement. Mindfulness-based therapies can be applied to individuals diagnosed with cancer within the scope of consultation-liaison psychiatry services. In addition, more comprehensive psychosocial interventions can be recommended for individuals with hematological cancer, to late-stage and to individuals with relapsing. These intervention studies should be disseminated, and the results should be published.

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