

## Posttraumatic Growth Among Turkish Older Adults with Diabetes

 Emre Senol-Durak<sup>1</sup>  Mithat Durak<sup>1</sup>

### Abstract

Diabetes is one of the well-known chronic disorder affects older adults life dramatically. Psychological effects of diabetic patients have been mentioned in several studies that highlight negative psychological consequences on patients. However, chronic disorders like diabetes are also related to several positive psychological changes. One of the positive changes, posttraumatic growth has been mentioned in literature as increase positive life view, changes in social relationships, engage in purposeful life activities, be aware of life worth after experiencing life changes such as suffering from a chronic illness, diabetes. The aim of the present study is to investigate possible associations among socio-demographic variables, perceived social support, cognitive processing and posttraumatic growth among diabetic older adults. Data were collected from diabetic older adults (N= 191) living in Turkey. Results revealed that a higher number of children, being outpatient and higher dietary adherence were associated with the PTG. After controlling the effect of socio-demographic variables, treatment-related variables, perceived social support received from family, and avoidance dimension of cognitive processing were significantly related with posttraumatic growth. Results were discussed in the sample of older adults.

**Keywords:** Posttraumatic growth, cognitive processing, perceived social support, social support from family, avoidance, and number of children.

### Key Practitioners Message

- When considering the ratio of diabetes among older adults is increasing, building a development strategy about growth is crucial.
- Encouraging familial support is important for diabetic older adults.
- Avoidance of diabetes is related to the PTG for diabetic older adults.

Older adults have suffered from several physical illnesses that make a significant difference in their life quality. Conducted studies largely emphasize negative effects of these physical illnesses on older adults such as depression (Aakhus, Flottorp, & Oxman, 2012; Abe, Fujise, Fukunaga, Nakagawa, & Ikeda, 2012; Cuijpers, de Wit, Kleiboer, Karyotaki, & Ebert, 2018), anxiety (Andreescu et al., 2009; Mohlman, Eldreth, Price, Staples, & Hanson, 2017; Niles et al., 2015) and sleep disorders (Pouwer, Kupper, & Adriaanse, 2010). On the other hand, recent studies focus on whether physical illnesses lead positive experiences such as resilience

(Hardy, Concato & Gill, 2004; Smith & Hollinger Smith, 2015) and posttraumatic growth (Tedeschi et al., 2018; Senol-Durak, 2014). In this respect, positive experiences among individuals suffering breast cancer (Ho, Chan, Yau, & Yeung, 2011; Tedeschi et al., 2018), heart disease (Senol-Durak & Ayvasik, 2010), traumatic brain injury (Stoner, Orrell, & Spector, 2015) and diabetes (Senol-Durak, 2014) have been examined in various studies by posttraumatic growth which is defined as increase in positive life view, change in social relationships, engage in purposeful life activities, be aware of life worth after experiencing life changes (Tedes-

**Correspondence:** Emre Senol-Durak. Department of Psychology, Bolu Abant Izzet Baysal University, Golkoy Kampusu, 14280, Bolu, TURKEY. e-mail: emresenoldurak@gmail.com

**Authors:** <sup>1</sup> Department of Psychology, Bolu Abant Izzet Baysal University, TURKEY

**Received:** 4 January 2018 | **Accepted:** 22 February 2018 | **Published Online:** 28 March 2018



chi et al., 2018; Tedeschi, Cann, Taku, Senol-Durak, & Calhoun, 2017). On the other hand, posttraumatic growth among diabetic patients has examined in few studies although diabetes leads several life-threatening complications such as organ failure or loss.

The prevalence rate of diabetes has increased to 12.4% from 2005 to 2010 while it was 5.8% from 1988 to 1994 in the United States (Selvin, Parri-nello, Sacks, & Coresh, 2014). The World Health Organization reported that there are 420 million individuals suffering from diabetes (WHO, 2016). Among 75 years older individuals, the ratio will be expected to be 44.9% in 2050 (Huang et al., 2014). Diabetes, being commonly observed among older adults (Huang et al., 2014), includes several complications. Dealing with those complications increases stress (Horsch, McManus, Kennedy, & Edge, 2007), particularly emotional stress (Pouwer et al., 2010) and researchers put emphasis on the importance of familial support (Rana, Rufus, Seema, & Nandinee, 2016). In a longitudinal study, distress scores of the most of diabetic patients (71%) increased during a 9-month period (Fisher et al., 2016). In this study, variables related to diabetes (i.e., treatment adherence etc.) were associated with diabetes-related stress. To see the effect of stress among those patients, PTSD is reported in some studies (i.e., Goodwin & Davidson, 2005) while diabetes-related distress is specifically identified in other studies (Fisher et al., 2016). In addition to stress, likewise diabetic patients in other age range, diabetic older adult patients are highlighted to experience burnout related to illness (Pouwer et al., 2010). Especially, decreased level of functionality among older adult patients make diabetic treatment more complicated (Chau & Edelman, 2001) and diet and weight are mentioned to be two demanding issues in diabetes (Nagelkerk, Reick, & Meengs, 2006).

During the treatment process, using effective coping strategies is noted to be important for the adjustment of diabetic patients (García-Mayor, & Larrañaga, 2011). Moreover, some positive experiences of diabetic patients have also been studied regarding spiritual growth (Cagle, Appel, Skelly, & Carter-Edwards, 2002) and psychological

resilience (Wee, Lee, Ravens-Sieberer, Erhart, & Li, 2005). Another positive experience observed in social relationships, spiritual growth, awareness of new possibilities and appreciation of life, post-traumatic growth (PTG) (Tedeschi et al., 2018), among diabetic patients has not been extensively studied in the literature. In a study conducted with diabetic patients, higher social support especially received from family, higher self-esteem and higher cognitive processing including rumination, hypervigilance and avoidance dimensions were related with posttraumatic growth (Senol-Durak, 2014). Similarly, the relationship between PTG and cognitive processing was reported as significantly positive in a cross-cultural study (Tedeschi, Cann, Taku, Senol-Durak, & Calhoun, 2017). In another study, lower education level, perceived social support, self-efficacy about diabetes management, problem-focused and optimistic coping were associated with posttraumatic growth (Dirik, & Gocek-Yorulmaz, 2018). Also, there was a significant positive correlation between social support and adherence to dietary, weight loss, and sports in a sample of diabetic patients (Kirk, Ebert, Gamble, & Ebert, 2013). Other PTG studies conducted with different samples have been mentioned positive correlation with PTG and number of child (Senol-Durak, 2007; Turner-Sack, Menna, & Setchell, 2012), being women (Morris, & Shakespeare-Finch, 2011; Senol-Durak, 2007) and younger age (Morris, & Shakespeare-Finch, 2011).

Taking into consideration that diabetes is increasing among older adult population dramatically in the future (Huang et al., 2014), developing psychological strategies to handle diabetes-related stress is essential. In the past decade, professionals have questioned how they can prevent developing psychopathology (i.e., depression or anxiety) among adults having diabetes. Changing focus from psychopathology to grow will help professionals to deal with diabetes-related stress and studies demonstrated adjustment (García-Mayor, & Larrañaga, 2011) and growth among diabetic patients (Gocek-Yorulmaz & Dirik, 2018; Senol-Durak, 2014). On the other hand, those studies were conducted with adult populations. There were no PTG studies conducted with older adult

diabetic patients, although diabetes is commonly seen among older adults (Huang et al., 2014) and several complications are experienced by them. Therefore, interrogating variables associated with the PTG is crucial in order to manage diabetes in a better way. Understanding associations between the PTG and socio-demographic variables (age, gender, number of children), treatment status, treatment adherence (diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence), social support and cognitive processing are aimed to examine in the present study. The present study hypothesized that those variables would be significantly correlated with the PTG.

## Methods

### Participants

A total of 191 older adults with diabetes whose ages ranged between 65 and 81 years ( $M = 69.16$ ,  $SD = 3.92$ ) participated in the present study. Among those participants, 79 were men (41.4%) and 112 were women (58.6%). The majority of those patients were primary school graduates ( $N = 158$ ; 82.7%) and married ( $N = 143$ ; 74.9%). The number of children was between 0 and 6 and ( $M = 3.91$ ,  $SD = 1.57$ ). Again, the majority of these patients reported that they live in the city ( $N = 88$ ; 46.1%) and have social security ( $N = 181$ ; 94.8%) (see Table-1).

Regarding illness related variables, 79 were inpatient (41.4%) and 112 were outpatient (58.6%). 49.7% of them ( $N = 95$ ) had history of prior hospitalization, while 50.3% ( $N = 96$ ) of them receive only outpatient treatment. Among hospitalized patients, 52.6% of them ( $N = 50$ ) had hospitalization for the first time. In terms of the type of treatment received, patients applied to different types of treatment: medication ( $N = 89$ ; 46.6%), insulin ( $N = 14$ ; 7.3%), and both insulin and medication ( $N = 88$ ; 46.1%). Most of the participants suffered another illnesses ( $N = 147$ ; 77.0%).

### Materials

Demographic Information Form included personal characteristics (e.g., age, education level, marital

status, etc.), health-related variables (e.g., treatment status, treatment type, presence of other medical illnesses), and treatment adherence (e.g., diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence). To identify treatment adherence, individuals respond how they had adhered to dietary, sports, non-smoking, no alcohol intake before receiving a diagnosis in a 4 point Likert scale. In addition, they responded how they adhered to those aspects after receiving diabetes diagnosis. To calculate total adherence score, the difference between those two scores (before and after diagnosis) was taken into account for each parameter (i.e., sports adherence = sports adherence before diagnosis - sports adherence after diagnosis). Therefore, treatment adherence scores were ranged in between -4 to +4.

The Post-Traumatic Growth Inventory (PTGI), is a 21 item six-point Likert type measure to assess the positive changes when encountering any kind of traumatic events (Tedeschi & Calhoun, 1996). Dirik (2006) translated the scale into Turkish and she found .94 internal consistency.

IES-R Impact of Events Scale - Revised is aimed to evaluate ruminations, hypervigilance, and avoidances with a 22 item five-point Likert type scale (Horowitz, Wilner, & Alvarez, 1979). Three-factor structure of the scale was found in the Turkish version as well and internal consistencies were ranged between .82 to .93 (Isikli, 2006).

Multidimensional Scale of Perceived Social Support (MSPSS) is aimed to evaluate perceived social support receives from friends, family, and significant others with a 12 item (Zimet, Dahlem, Zimet, & Farley, 1988). Turkish adaptation revealed the three-factor structure which was consistent with the developers' result (Eker, Akar, & Yaldız, 2000).

### Procedure

The ethical and legal approval was taken from Abant İzzet Baysal University, Ankara Kecioren Education and Research Hospital and Provincial Directorates of Health in Ankara, Bolu. After informing patients about the study, scales were administered to them. It took 20-25 minutes to complete questionnaires.

## Results

### Preliminary analysis

The possible ranges, means, standard deviations, and correlations for all study variables were displayed in Table-1. The PTG scores were closely correlated to subscales of IES-R, subscales of MPSS, number of children, and the adherence of diet, sports, and weight loss.

### Hierarchical regression results for PTG

The significant associates of post-traumatic growth were revealed by performing hierarchical regression analysis in which variables were entered into the equation via three steps.

The possible effects of personal (i.e., age, gender, number of children), health-related (i.e., presence of other medical illnesses, treatment status, treatment type, and time since diagnosis), and adherence after diagnosis (i.e., sports, diet, weight loss, non-smoking, and no alcohol) were entered into the equation on the first step via the enter method. The variables of perceived social support (i.e.,

PSS family, PSS friends, and PSS significant others) were entered into the equation on the second step via enter method. Finally, on the third step, the variables of the impact of the event (i.e., rumination, hypervigilance, and avoidance) were entered into the equation via the enter method.

On the first step, “number of children” ( $\beta = .14$ ,  $t(177) = 2.07$ ,  $p = .039725$ ), “treatment status (being outpatient)” ( $\beta = -.34$ ,  $t(177) = -4.95$ ,  $p = .000002$ ), and “diet adherence” ( $\beta = .22$ ,  $t(177) = 2.99$ ,  $p = .003226$ ) had significant association with post-traumatic growth, and these variables explained 30.3% of the variance ( $F[12, 177] = 6.40$ ,  $p = .000001$ ).

On the second step, just “perceived social support from family” ( $\beta = .24$ ,  $t(174) = 3.56$ ,  $p = .000476$ ) had significant association with post-traumatic growth, and with the entrance of dimensions of perceived social support variables explained variance increased to 40.8% ( $F[3, 174] = 10.30$ ,  $p = .000003$ ).

**Table-1:** The descriptive statistics of the variables and the correlations among the variables for older adults with diabetes (N = 191)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Posttraumatic Growth		.50***	.47***	.61***	.38***	.28***	.39***	.26***	.16*	-.01	.33***	.23**	.24***	.08	.14
2. Rumination			.85***	.51***	.10	.13	.27***	.29***	.06	-.03	.18*	.22**	.24***	-.05	-.03
3. Hypervigilance				.53***	.03	.06	.21**	.34**	.15*	-.02	.13	.16*	.12	-.06	-.07
4. Avoidance					.25***	.20**	.32***	.31***	.08	.00	.14*	.19*	.09	.05	.09
5. PSS Family						.27***	.47***	.07	-.01	.01	.18*	-.02	.07	.04	.12
6. PSS Friends							.60***	-.02	-.08	.03	.24***	.16*	.18*	.03	.11
7. PSS Significant Others								.14*	-.02	-.01	.22	.12	.26***	.10	.20**
8. Number of Children									.13	-.13	.07	.10	.08	.03	-.03
9. Age										-.09	.00	.04	.05	-.04	-.03
10. Time since Prognosis (days)											.11	.02	.05	.13	.11
11. Diet Adherence												.28***	.49***	.07	.17*
12. Sport Adherence													.42***	.05	.13
13. Weight Adherence														.16*	.21
14. Non-Smoking Adherence															.61***
15. No Alcohol Adherence															
Mean	43.14	9.96	8.54	9.92	22.84	15.37	17.06	3.91	69.16	3949	1.92	0.61	1.35	0.67	0.45
Standard Deviation	26.94	9.05	7.40	7.29	7.36	9.71	9.22	1.57	3.92	3128	1.47	1.75	1.62	1.48	1.22
Minimum	0	0	0	0	4	4	4	0	65	1	-1	-4	-4	-4	-2
Maximum	104	30	24	31	28	28	28	6	81	14600	4	4	4	4	4
Possible Range	0 - 105	0 - 40	0 - 30	0 - 40		4 - 28		0 - 6 <sup>u</sup>						(-4) - (+4)	

Note 1: PSS = Perceived social support from  
 Note 2: \* =  $p < .05$ , \*\* =  $p < .01$ , \*\*\* =  $p < .001$ .  
 Note 3: <sup>u</sup> = Real range

On the third step, just “avoidance” ( $\beta = .35, t(171) = 5.32, p = .000001$ ), had significant association with post-traumatic growth, and with the entrance of cognitive processing dimensions explained variance increased to 55.8% ( $F[3, 171] = 19.34, p = .000001$ ). The results of the hierarchical regression analysis were displayed in [Table-2](#).

## Discussion

The diabetes-related threats on the psychological well-being of patients have been extensively mentioned in the literature. However, the positive outcome of the illness (i.e., posttraumatic growth) has not been studied broadly. The possible associations between the PTG and socio-demographic variables (age, gender, number of children), treatment status, treatment adherence (diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence), social support and cognitive processing

were aimed to investigate in this study. For this purpose, older adult diabetic patients were selected for the first time to reveal variables associated with the PTG and specific to this population.

Concerning the socio-demographic variables, only “the number of children” was significantly associated with the PTG. Patients with a higher number of children had higher PTG scores, likewise seen in other studies conducted with different samples ([Senol-Durak, 2007](#); [Turner et al., 2012](#)). The reason why these two variables were associated is that older adults might need the help of their children related to involvement to treatment. In addition to this variable, inpatients had higher scores of the PTG as compared with outpatients. Older adults having treatment at a hospital might receive more attention for their treatment from hospital staff (i.e. doctors, nurses) and they might feel they are under control. Therefore, outpatients had higher scores of the PTG. Also, among treat-

**Table-2:** Variables associated with posttraumatic growth among older adults with diabetes

DV: Post Traumatic Growth						
Set	Predictors in set	F for set	t for w/in set Predictors	df	Beta ( $\beta$ )	Model R <sup>2</sup> Change
I.	<i>Personal, Health-Related, and Behavioral Change Variables</i>	6.40***		12,177		.30
	Age		1.04	177	.07	
	Gender (being men)		.42	177	.03	
	Number of Children		2.07*	177	.14	
	Presence of Other Medical Illnesses		-.01	177	-.01	
	Treatment Status (being outpatient)		-4.95***	177	-.34	
	Treatment Type		-1.07	177	-.07	
	Time since Diagnosis		.18	177	.01	
	Diet Adherence		2.99**	177	.22	
	Sports Adherence		.77	177	.05	
	Weight Loss Adherence		.59	177	.05	
	Non-Smoking Adherence		.26	177	.02	
No Alcohol Adherence		1.06	177	.09		
II.	<i>Perceived Social Support</i>	10.30***		2, 174		.11
	PSS Family		3.56***	174	.24	
	PSS Friends		1.52	174	.12	
	PSS Significant Others		.85	174	.07	
III.	<i>Impact of Event</i>	19.34***		1, 171		.15
	Rumination		1.59	171	.17	
	Hypervigilance		.25	171	.03	
	Avoidance		5.32***	171	.35	

Note-1: \* =  $p \leq .05$ , \*\* =  $p \leq .01$ , \*\*\* =  $p \leq .001$

ment adherence variables, only higher diet adherence was associated with the higher PTG. As mentioned before, diet adherence is important in the prognosis of diabetes (Nagelkerk et al., 2006). When interacting with diabetic older adults, they shared their experiences about what sorts of food increase their insulin level. In addition, they share positive feelings when consuming healthier foods. Therefore, it can be said that they have selective attention to dietary in their regular life. On the other hand, other adherences (adherence to sports, no smoking, and no alcohol intake) were not related with the PTG. This insignificance is due to the sample characteristics. The sample is composed of older adults who have limits for smoking, alcohol, and exercising. Therefore, the role of those adherences is recommended to investigate among adults and adolescents in the future.

Regarding the role of perceived social support, individuals having higher family support had higher PTG scores. Same results obtained from diabetic older adults as well (Senol-Durak, 2014). In a collectivistic culture, the family is so close to the health problems of their members. Additionally, among cognitive processing variables, only avoidance was associated with the PTG. Likewise, avoidance is accepted as a unique predictor of depression and anxiety in the older adults (Andrew & Dulin, 2007), it was the only dimension associated with the PTG. Therefore, specific cognitive processing variable for diabetic older adults is avoidance. The role of avoidance on PTG was also seen in other studies conducted with either diabetic patients (Senol-Durak, 2014) or different samples (Senol-Durak & Ayvasik, 2010) but in those studies, other cognitive processing domains (rumination and hypervigilance) were also significantly associated with the PTG.

The current study was conducted with diabetic older adults. Therefore, results should not be interpreted other diabetic patients with different age ranges. Variables entered to regression equation explained 55.8% of the variance in the PTG that is quite high. Further studies are encouraged to see the consistency of findings. Also, in respect to variables entered into first equation (diet ad-

herence, inpatients) the role of locus of control is questioned for further studies.

Regarding clinical implications, as mentioned before, facilitating growth over individuals should be one of agenda of professionals (Senol-Durak & Ayvasik, 2010). Considering results, professionals developing the PTG program can focus on more with older adult patients having a lower number of children or no children, outpatients and patients with lower diet adherence since those individuals had lower PTG scores. In order to convey are needed more attention to intervene. In addition, psychoeducation programs for diabetic patients and their families can be developed especially for individuals having lower family support. With the help of intervention programs at health services, stressful nature of diabetes will promote posttraumatic growth for sufferers.

## Acknowledgement

This research was supported by a grant from The Scientific and Technological Research Council of Turkey (TUBITAK) (Project No: SOBAG-109K528).

## References

- Aakhus**, E., Flottorp, S. A., & Oxman, A. D. (2012). Implementing evidence-based guidelines for managing depression in elderly patients: a Norwegian perspective. *Epidemiology and Psychiatric Sciences*, 21(3), 237-240. [Crossref]
- Abe**, Y., Fujise, N., Fukunaga, R., Nakagawa, Y., & Ikeda, M. (2012). Comparisons of the prevalence of and risk factors for elderly depression between urban and rural populations in Japan. *International Psychogeriatrics*, 24(8), 1235-1241. [Crossref]
- Altintas**, E., Gallouj, K., & Guerrien, A. (2012). Social support, depression and self-esteem in older persons: Cluster analysis results. *Annales Medico-Psychologiques*, 170(4), 256-262. [Crossref]
- Alexopoulos**, G. S. (2005). Depression in the elderly. *Lancet*, 365, 1961-1970. [Crossref]
- Andreescu**, C., Lenze, E. J., Mulsant, B. H., Wetherell, J. L., Begley, A. E., Mazumdar, S., & Reynolds, C. F. III

- (2009). High worry severity is associated with poorer acute and maintenance efficacy of antidepressants in late-life depression. *Depression & Anxiety*, 26(3), 266-272. [Crossref]
- Andrew, D. H., & Dulin, P. L.** (2007). The relationship between self-reported health and mental health problems among older adults in New Zealand: experiential avoidance as a moderator. *Aging & Mental Health*, 11(5), 596-603. [Crossref]
- Cagle, C. S., Appel, S., Skelly, A. H., & Carter-Edwards, L.** (2002). Mid-life African-American women with type 2 diabetes: Influence on work and the multicaregiver role. *Ethnicity and Disease*, 12(4), 555-566.
- Chau, D., & Edelman, S. V.** (2001). Clinical management of diabetes in the elderly. *Clinical Diabetes*, 19(4), 172-175. [Crossref]
- Conwell, Y., Duberstein, P. R., & Caine, E. D.,** Risk factors for suicide in later life, *Biological Psychiatry*, 52 193-204, 2002. [Crossref]
- Cuijpers, P., de Wit, L., Kleiboer, A., Karyotaki, E., & Ebert, D. D.** (2018). Problem-solving therapy for adult depression: An updated meta-analysis. *European Psychiatry*, 48, 27-37. [Crossref]
- Dirik, G.** (2006). *Predictor variables of depression, anxiety and posttraumatic growth among rheumatoid arthritis patients*. Unpublished doctoral thesis, Middle East Technical University, Ankara.
- Dirik, G., & Gocek-Yorulmaz, E.** (2018). Positive Sides of the Disease: Posttraumatic Growth in Adults with Type 2 Diabetes. *Behavioral Medicine*, 44(1), 1-10. [Crossref]
- Eker, D., Arkar, H., & Yaldiz, H.** (2000). Generality of support sources and psychometric properties of a scale of perceived social support in Turkey. *Social Psychiatry and Psychiatric Epidemiology*, 35(5), 228-233.
- Fisher, L., Hessler, D., Polonsky, W., Strycker, L., Masharani, U., & Peters, A.** (2016). Diabetes distress in adults with type 1 diabetes: prevalence, incidence and change over time. *Journal of Diabetes and its Complications*, 30(6), 1123-1128. [Crossref]
- Fortune, D. G., Richards, H. L., Griffiths, C. E. M., & Main, C. M.** (2005). Adversarial growth in patients undergoing treatment for psoriasis: A prospective study of the ability of patients to construe benefits from negative events. *Psychology, Health & Medicine*, 10(1), 44-56. [Crossref]
- Francis, H. M.,** (2004). The relationship between personal and environmental resources, subjective experience with trauma, and posttraumatic growth in low socioeconomic individuals with cancer. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 64(7-B), 3525
- García-Mayor, R. V., Larrañaga, A.** (2011). Inadequate coping attitudes, disordered eating behaviours and eating disorders in type 1 diabetic patients. In L. Chih-Pin (Ed.), *Type 1 Diabetes-Complications, Pathogenesis, and Alternative Treatments* (pp. 95-118). Croatia: Intech Open Access. [Crossref]
- Goodwin, R. D., & Davidson, J. R.** (2005). Self-reported diabetes and posttraumatic stress disorder among adults in the community. *Preventive Medicine*, 40(5), 570-574. [Crossref]
- Helgeson, V. S., Reynolds, K. A., & Tomich, P. L.** (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology*, 74(5), 797-816.
- Ho, S. M., Chan, M. W., Yau, T. K., & Yeung, R. M.** (2011). Relationships between explanatory style, posttraumatic growth and posttraumatic stress disorder symptoms among Chinese breast cancer patients. *Psychology & Health*, 26(3), 269-285. [Crossref]
- Horsch, A., McManus, F., Kennedy, P., & Edge, J.** (2007). Anxiety, depressive, and posttraumatic stress symptoms in mothers of children with type 1 diabetes. *Journal of Traumatic Stress*, 20(5), 881-891. [Crossref]
- Horowitz, M., Wilner, N., & Alvarez, W.** (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine*, 41(3), 209-218.
- Huang, E. S., Laiteerapong, N., Liu, J. Y., John, P. M., Moffet, H. H., & Karter, A. J.** (2014). Rates of complications and mortality in older patients with diabetes mellitus: the diabetes and aging study. *JAMA Internal Medicine*, 174(2), 251-258. [Crossref]

- Isikli, S.** (2006). *Relations between attentional bias regarding the incident, peritraumatic dissociation and working memory span in individuals with post-traumatic stress symptoms*. Unpublished doctorate thesis, Hacettepe University, Ankara.
- Kirk, J. K., Ebert, C. N., Gamble, G. P., & Ebert, C. E.** (2013). Social support strategies in adult patients with diabetes: a review of strategies in the USA and Europe. *Expert Review of Endocrinology & Metabolism*, 8(4), 379-389. [[Crossref](#)]
- Langa, K. M., Vijan, S., Hayward, R. A., Chernew, M. E., Blaum, C. S., Kabeto, M. U., et al.** (2002). Informal caregiving for diabetes and diabetic complications among elderly Americans. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 57(3), S177-S186. [[Crossref](#)]
- Mohlman, J., Eldreth, D. A., Price, R. B., Staples, A. M., & Hanson, C.** (2017). Prefrontal-limbic connectivity during worry in older adults with generalized anxiety disorder. *Aging & Mental Health*, 21(4), 426-438. [[Crossref](#)]
- Morris, B. A., & Shakespeare-Finch, J.** (2011). Cancer diagnostic group differences in posttraumatic growth: Accounting for age, gender, trauma severity, and distress. *Journal of Loss and Trauma*, 16(3), 229-242. [[Crossref](#)]
- Nagelkerk, J., Reick, K., & Meengs, L.** (2006). Perceived barriers and effective strategies to diabetes self management. *Journal of Advanced Nursing*, 54(2), 151-158. [[Crossref](#)]
- Niles, A. N., Dour, H. J., Stanton, A. L., Roy-Byrne, P. P., Stein, M. B., Sullivan, G., ... & Craske, M. G.** (2015). Anxiety and depressive symptoms and medical illness among adults with anxiety disorders. *Journal of Psychosomatic Research*, 78(2), 109-115. [[Crossref](#)]
- Pouwer, F., Kupper, N., & Adriaanse, M. C.** (2010). Does emotional stress cause type 2 diabetes mellitus? A review from the European Depression in Diabetes (EDID) Research Consortium. *Discovery Medicine*, 9(45), 112-118.
- Rana, S., Rufus, N., Seema, N. N., & Nandinee, D.** (2016). Role of Expressed Emotion and Gender in Adversarial Growth of People with Type 2 Diabetes. *Journal of the Indian Academy of Applied Psychology*, 42(2), 264.
- Senol-Durak, E.** (2014). Stress related growth among diabetic outpatients: role of social support, self-esteem, and cognitive processing. *Social Indicators Research*, 118(2), 729-739. [[Crossref](#)]
- Senol-Durak, E.** (2007). *Environmental and individual resources, perception of the event, cognitive processing and coping as factors leading to posttraumatic growth among the survivor of myocardial infarction patients and their spouses*. (Ph.D. Doctorate Thesis), Middle East Technical University.
- Senol-Durak, E., & Ayvasik, H. B.** (2010). Factors associated with posttraumatic growth among myocardial infarction patients: perceived social support, perception of the event and coping. *Journal of Clinical Psychology in Medical Settings*, 17(2), 150-158. [[Crossref](#)]
- Selvin, E., Parrinello, C. M., Sacks, D. B., & Coresh, J.** (2014). Trends in prevalence and control of diabetes in the United States, 1988-1994 and 1999-2010. *Annals of Internal Medicine*, 160(8), 517-525. [[Crossref](#)]
- Smith, J. L., & Hollinger-Smith, L.** (2015). Savoring, resilience, and psychological well-being in older adults. *Aging & Mental Health*, 19(3), 192-200. [[Crossref](#)]
- Tedeschi, R. G., & Calhoun, L. G.** (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, 9(3), 455-471. [[Crossref](#)]
- Tedeschi, R. G., Cann, A., Taku, K., Senol-Durak, E., & Calhoun, L. G.** (2017). The Posttraumatic Growth Inventory: A Revision Integrating Existential and Spiritual Change. *Journal of Traumatic Stress*, 30(1), 11-18. [[Crossref](#)]
- Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., Calhoun, L. G., Aboelela, S., Larson, E., . . . Glied, S.** (2018). Posttraumatic growth in cancer patients and partners-effects of role, gender and the dyad on couples' posttraumatic growth experience. In *Posttraumatic Growth: Theory, Research, and Applications* (Vol. 42, pp. vii-viii): Brunner/Mazel Washington, DC.

- Turner-Sack, A. M., Menna, R., & Setchell, S. R.** (2012). Posttraumatic growth, coping strategies, and psychological distress in adolescent survivors of cancer. *Journal of Pediatric Oncology Nursing, 29*(2), 70-79. [\[Crossref\]](#)
- WHO** (World Health Organization) (2016). Global report on diabetes. WHO Library Cataloguing-in-Publication Data.
- Wee, H. L., Lee, W. W. R., Ravens-Sieberer, U., Erhart, M., & Li, S. C.** (2005). Validation of the English version of the KINDL® generic children's health-related quality of life instrument for an Asian population - results from a pilot test. *Quality of Life Research, 14* 1193-1200. [\[Crossref\]](#)
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K.** (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41. [\[Crossref\]](#)