

Stress, Self-Perception and Interpersonal Style in Patients with Physical Illnesses*,**



Ayşegül DURAK BATIGÜN, Nesrin HİSLİ ŞAHİN, Esra KARSLI DEMİREL

SUMMARY

Objective: This study aimed to investigate the role of self-perception, interpersonal style, and anger in the context of stress in patients with physical illnesses, including coronary artery disease, gastrointestinal disorders, dermatological disorders, and diabetes.

Materials and Methods: The study sample included patients with physical illnesses (n = 124) and healthy controls (n = 209). Symptoms of stress, self-perception, interpersonal style, and anger were evaluated using the Stress Symptoms Scale, Social Comparison Scale, Interpersonal Style Scale, and Multidimensional Anger Questionnaire, respectively. The role of self-perception, interpersonal style, and anger in stress experienced in the patients and controls was compared.

Results: The patients had higher stress symptoms, perceived themselves more negatively, had more problematic interpersonal styles, and more intense anger than the controls. The higher stress symptoms in the patients and the lower symptoms in the controls was predicted by 4 common variables: dissatisfaction with life, dissatisfaction with interpersonal relationships, negative self-perception, and aggressive expression of anger. Another predictive variable in the psychosomatic group was age, whereas in the control group gender and internalized anger were predictive variables.

Conclusion: As the physical illnesses had by those in the patient group are stress-related, inclusion of psychosocial interventions in treatment protocols, such as communication skills, and stress and anger management training, and interventions aimed at increasing a positive self-perception might improve their QoL.

Keywords: Physical illnesses, self-perception, interpersonal style, anger

INTRODUCTION

Recent studies on stress have shown that stress is not only a contributing factor in psychiatric disorders, but is also a risk factor in the etiology of physical illnesses, such as coronary artery disease, diabetes, gastrointestinal disorders, and some dermatological disorders (Lehman et al. 1991; Rice 1999; Lovallo 2005). Chronic stress due to physiological changes that take place in its natural course, is a cognitive, emotional, and behavioral experience (Schneiderman et al. 2005). As such, the etiology of such physical illnesses as coronary artery disease, dermatological disorders, and diabetes is gener-

ally considered to be related to chronic stress (Taylor 2009); however, it is also known that stress is not independent of an individual's perception, and interpretation of events and situations (Lazarus 1984). These perceptions and interpretations, on the other hand, cannot be separated from personality or the various cognitive, emotional, and behavioral variables that comprise it (Lawson et al. 2010).

Although research shows that there are several psychological variables related to stress and physical illnesses, those that are highlighted are personality in general (Yousfi et al. 2004; Brufau et al. 2010), and self-perception in specific. It is

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¹Psych. Assoc.Prof., Ankara University, Faculty of Letters, Psychology Department, ²Psych. Prof., Başkent University Faculty of Arts and Sciences Psychology Department, Ankara. ³Psych. Specialist, Erzincan University, Center of Life Skills, Erzincan.

Ayşegül Durak Batigün MD, e-mail: ayseguldurak@yahoo.com

thought that self-perception is a product of a series of evaluations made at different times (Engler 1985). It is known that acceptance by others and satisfactory interpersonal relationships contribute positively to self-perception (Özbay et al. 2002; Broemer and Blümle 2003). As such, self-perception affects interpersonal relationships (Pielage 2005). Interpersonal relationships are important factors that elicit various emotions, one of which is anger (Wiseman et al. 2006). The way anger is expressed is related to interpersonal style. The anger one experiences in response to an attack, criticism, or obstacle, leads to interpersonal conflict and negatively affects physical and psychological health (Andersson et al. 2008).

Few studies have examined the relationship between self-perception, interpersonal style, and anger, and physical illnesses. In most cases these variables have been studied individually. For example, a study that examined the relationship between chronic psoriasis and vitiligo, and self-perception reported that the patients had lower self-esteem (Sukan and Maner 2006). A study that included patients with acne-vulgaris reported that patients with dermatological disorders had lower self-esteem than controls (Yarpuz-Yolaç et al. 2008). Some studies reported that patients with various dermatological (Stangier et al. 2003) and coronary artery diseases (Sarandöl 2003) have interpersonal relationship problems. Most of the studies that analyzed the relationship between anger and physical illnesses were conducted with patients with coronary artery disease. These studies reported that unexpressed anger can sometimes be internalized, contributing to the development of coronary artery diseases and hypertension (Davidson et al. 2000; Smith et al. 2004).

Self-perception is developed in the social context we grow up in and then aids in our interpretation and organization of our experiences. Simultaneously, self-perception plays a role in the evaluation of the feelings, thoughts, and behaviors of other people, and affects our verbal and behavioral reactions to them. Self-schemata, which are composed of past experiences, are a reference point in interpersonal relationships and format the meaning of ones interpersonal circle. Similarly, interactions with important others have an effect on self-perception (Shaver and Miculincer 2002). Interpersonal relationships are considered important variables affecting psychological health (Albayrak-Kaymak 1994); therefore, they are central to an understanding of both normal and pathological development. The present study aimed to investigate the relationship between these 3 variables and stress in patients with physical illnesses.

MATERIAL AND METHODS

Participants

The study included patients with diabetes (n = 32), coronary artery disease (n = 32), gastrointestinal disorders (n = 31),

and dermatological disorders (n = 31) that were treated at several hospitals in Ankara, Turkey. The control group was created using the snowball method and included volunteers without any physical or psychological complaints (n = 209). More than half of the patients were female (62.4%). The age range was between 18-65, and the mean age was 41.69 the women in the comparison group also were greater in number (55.5%). Their age ranged from 18 to 65 years, and the mean age was 34.08 years.

Data collection instruments

Demographic information form

This questionnaire was composed of 34 items, some of which were open-ended questions and others that were answered on a 5-point Likert-type scale. The participants reported the perceptions of their current economic, physical, and emotional status, and their life in general on the Likert-type items. The responses to these 4 items were indexed as dissatisfaction with life, as higher scores indicated dissatisfaction. Similarly, the participants rated their satisfaction with their family of origin, their relationship with their intimate partner, relationships with friends, level of loneliness, and the number of close friends. The responses to these items, as a total, were computed as a score for dissatisfaction with interpersonal relationships.

Interpersonal Style Scale

This 60-item 5-point Likert-type scale developed by Şahin et al. (2007) measures interpersonal communication style. Factor analysis during the scale's development process revealed 6 factors: dominant style, avoidant style, angry style, insensitive style, manipulative style, and belittling style. The scale was reported to yield satisfactory psychometric data (Şahin et al. 2007).

Stress Symptoms Scale

This 5-point Likert-type scale developed by Miller, Smith, and Mahler has 7 subscales: muscular system ($\alpha = .92$), parasympathetic system ($\alpha = .91$), sympathetic system ($\alpha = .94$), emotional system ($\alpha = .93$), cognitive system ($\alpha = .91$), endocrine system ($\alpha = .95$), and immune system ($\alpha = .96$). There are 10 items regarding system-specific symptoms on each subscale. Higher scores indicate an increase in symptoms. The scale was adapted for use in Turkey by Day (1992), Şahin and Durak (1994), Şahin and Batugün (1997), and Onbaşıoğlu (2006), with satisfactory psychometric values.

Multi-Dimensional Anger Scale

This Likert-type scale developed by Balkaya and Şahin (2003) consists of 5 dimensions: anger symptoms, anger-related situations, anger-related thoughts, anger-related behaviors, and

Table 1. Relationships between the study variables.

	Anger	Interpersonal anger	Anger-related behaviors	Interpersonal style	Self-perception
Stress symptoms	.38**	.38**	.32**	.34**	-.26**
Muscular system	.29**	.29**	.20**	.21**	-.23**
Parasympathetic system	.25**	.24**	.20**	.22**	-.12*
Sympathic system	.25**	.24**	.20**	.26**	-.19**
Emotional system	.44**	.40**	.37**	.37**	-.29**
Cognitive system	.40**	.37**	.35**	.32**	-.22**
Endocrine system	.33**	.33**	.28**	.28**	-.18**
Immunity system	.25**	.27**	.15**	.21**	-.14*

interpersonal anger. In the present study only the anger-related behaviors and interpersonal anger dimensions were used. The anger-related behaviors dimension has 3 subscales: aggressive behaviors, anxious behaviors, and trying to remain calm. The interpersonal anger dimension has 4 subscales: vindictive reactions, passive-aggressive reactions, internalization reactions, and indifferent reactions. The scale's reliability and validity are well known.

Social Comparison Scale

This 18-item 6-point Likert-type scale measures self-evaluation in 18 dichotomous dimensions, based on a comparison to others. The original version was a 5-item scale developed by Gilbert and Trent (1995). During its Turkish adaptation 13 items were added and a new version was developed (Şahin and Şahin 1992). High scores indicate positive self-perception; its reliability and validity are well known.

Procedure

The scales were administered as a battery. The first page explained the purpose and importance of the study. In order to control for the effect of order, the order of the forms, other than the demographic form, were varied in the battery. Participants that voluntarily agreed to participate and provided written informed consent were included in the study.

RESULTS

Intercorrelations between the variables

As the aim of this study was to investigate the relationship between stress, interpersonal style, self-perception and anger in the context of physical illnesses, we first analyzed this relationship (Table 1).

As the table shows, all of the variables were correlated significantly in the expected direction. Anger (interpersonal anger reactions and anger behaviors) was positively correlated with all the somatic, emotional, and cognitive system stress symptoms ($P < 0.001$, $r = .44$, and $r = .15$). Similarly, as negative interpersonal styles increased stress symptoms (both physi-

cal and psychological) increased, and vice versa. These correlations ranged from .21 ($P < 0.001$) to .37 ($P < 0.001$). Additionally, a decrease in self-perception score was correlated with an increase in stress symptoms score (or a decrease in stress symptoms was correlated with an increase in self-perception). These negative correlations ranged from $-.12$ ($P < 0.01$) to $-.29$ ($P < 0.001$).

Comparison of the patient and control groups in terms of the research variables

The second analysis was based on a t-test comparison of the 2 groups, in terms of the somatic, emotional, and cognitive symptoms of stress (Table 2).

As seen in Table 2, the control group had significantly lower stress symptoms scores related to the muscular system, sympathetic system, parasympathetic system, emotional system, cognitive system, and immune system. A similar comparison was made regarding the 2 groups' Self-Perception Scale,

Table 2. Comparison between the patient and control groups, in terms of the study variables.

	Patient group n = 124		Control group n = 209		t
	x	SD	x	SD	
Stress symptoms	145.03	37.78	123.13	36.03	3.48***
Parasympathetic system	21.38	6.55	17.33	5.93	3.79***
Sympathic system	20.73	8.12	16.13	6.07	3.86***
Endocrine system	20.32	5.88	15.18	4.74	5.75***
Immunity system	17.97	5.50	14.15	5.15	4.20***
Interpersonal style	131.65	29.66	115.45	24.77	3.44***
Dominant	25.93	7.88	22.10	6.99	3.00**
Avoidant	24.15	7.19	21.68	6.28	2.13*
Angry	22.60	7.03	20.01	5.98	2.31*
Insensitive	24.55	6.89	22.40	5.51	1.99*
Manipulative	25.07	6.05	20.45	5.35	4.72***
Self-Perception	83.93	16.03	87.05	12.18	-1.32
Anger	195.16	35.39	183.82	33.73	2.63**
Anger-related behaviors	70.70	9.34	67.24	10.85	2.03*
Interpersonal-anger	125.60	28.71	114.34	26.87	2.37*
Internalized reactions	31.85	7.78	28.61	6.91	2.57**

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Table 3. Comparison of the patients.

	Patients with coronary artery disease n = 32		Patients with gastrointestinal disorders n = 29		Patients with dermatological disorders n = 31		Patients with diabetes n = 32		F
	x	SD	x	SD	x	SD	x	SD	
	Stress symptoms	135.47	38.05	158.28	38.87	147.00	35.42	138.59	
Muscular system	20.06	7.72	23.50	7.02	20.67	6.00	19.30	6.00	2.13
Parasympathetic system	19.55_a	7.18	24.96_b	7.02	20.27	5.81	23.30	6.91	3.92**
Sympathetic system	22.90	8.42	21.43	8.56	18.80	7.12	22.90	8.21	1.73
Emotional system	22.00	9.21	24.69	9.75	22.23	7.88	21.57	8.45	.74
Cognitive system	24.30	9.20	27.52_b	9.57	24.37	8.58	20.86_a	8.00	2.73*
Endocrine system	19.33	7.12	19.61	6.16	20.78	5.16	23.32	6.24	2.16
Immunity system	14.93_b	4.54	18.75	6.90	20.38_a	5.00	15.59_b	5.08	6.59***
Interpersonal style	131.93	29.09	131.61	33.85	143.17	36.32	129.56	40.51	.90
Dominant	26.50	9.03	26.24	8.81	28.48	10.27	26.76	11.20	.32
Avoidant	25.52	6.50	24.41	7.84	26.84	8.27	23.74	8.57	.92
Angry	21.72	7.59	21.96	6.67	24.93	6.96	20.77	8.37	1.77
Insensitive	24.81	7.10	26.41	7.41	25.42	6.99	22.72	6.58	1.43
Manipulative	24.97	6.40	24.07	6.30	26.52	6.41	24.26	7.28	.85
Belittling	8.84	3.53	9.25	2.90	10.52	5.10	9.00	3.43	1.22
Self-perception	86.27	11.62	81.44	14.72	80.67	15.58	80.24	16.46	1.04
Anger	197.26	29.44	184.00	35.70	207.80	35.29	191.73	36.42	2.35
Anger-related behaviors	73.03	11.23	68.93	10.09	73.26	11.20	70.81	9.93	1.08
Aggressive behaviors	25.90	6.87	25.24	6.80	26.00	6.75	26.56	8.12	.17
Trying to remain calm	34.19	7.77	31.11	6.01	33.74	6.48	31.52	7.64	1.47
Anxious behaviors	13.41	3.85	12.83	2.83	13.52	3.62	12.53	2.60	.65
Interpersonal anger	123.32	22.16	116.35	27.82	134.27	27.78	120.73	31.28	2.21
Vindictive reactions	51.86	15.93	50.93	14.98	57.33	20.15	54.54	22.46	.70
Passive-aggressive reactions	31.12	6.52	29.61	7.41	34.23	6.97	30.77	7.49	2.28
Internalized reactions	31.22	6.30	29.43_b	7.68	35.57_a	6.34	28.50_b	7.96	5.82***
Indifferent reactions	7.16	2.97	6.88	2.44	7.13	3.89	7.35	3.19	.10

Note: Same letters indicate no significant difference.

*P < 0.05, **P < 0.01, ***P ≤ 0.001

Interpersonal Style Scale, and Multidimensional Anger Scale scores. As Table 2 shows, the patients scored significantly higher on the Multidimensional Anger Scale, especially on the internalized anger subscale. In terms of interpersonal style, dominant and manipulative styles were also significantly higher in the patient group. On the other hand, even though there wasn't a significant difference in the Self-Perception Sale score between the 2 groups, scores in the patient group were generally lower.

Comparisons within the patient group

Although not a specific aim of the present study, we thought that it would be interesting to determine if the patients differed among themselves, in terms of the study variables; the results are shown in Table 3.

Although the difference was not significant, the patients with gastrointestinal disorders had the highest stress symptoms (physical, emotional and cognitive) scores ($x = 158.28$, $ss = 38.87$). In general, the patients with gastrointestinal disorders, which are primarily regarded as parasympathetic system

disorders, had significantly higher parasympathetic system symptoms scores than the patients with other disorders; the difference was significant between these patients and those with coronary artery diseases, which are primarily regarded as sympathetic system disorders.

Similarly, immune system symptoms scores in the patients with dermatological disorders, which are considered immune system disorders, were significantly higher than in the patients with diabetes and coronary artery diseases. Cognitive system symptoms scores in the patients with gastrointestinal disorders were significantly higher than those in the diabetes patients. Endocrine system symptoms scores in the patients with diabetes were higher than those in the other patients, but the difference was not statistically significant. These results are interesting and support the validity of the Stress Symptoms Scale used in the current study.

Another interesting finding seen in Table 3 is the higher (though not statistically significant) anger ($x = 207.80$, $ss = 35.29$), negative interpersonal style ($x = 143.17$, $ss = 36.12$), and interpersonal anger ($x = 134.27$, $ss = 27.78$) scores in

the dermatological patients; these higher internalized anger scores reached the level of statistical significance ($x = 35.57$, $ss = 6.34$, $t = 5.82$, $P < 0.001$), as compared to the patients with gastrointestinal disorders ($x = 29.43$, $ss = 7.68$), and diabetes ($x = 28.50$, $ss = 7.96$).

Variables that predicted stress symptoms in the patient and control groups

Two hierarchical analyses were conducted to investigate the variables that predicted the more serious stress symptoms in the patients and the milder stress indicators in the control group. First the demographic variables (age, level of education, marital status, level of income, and gender) were entered into the analysis. Then, anger-related behaviors (aggressive behaviors, trying to stay calm, and anxious behaviors) were entered. Thirdly, interpersonal anger (vindictive, passive-aggressive, internalizing, and indifferent reactions) was entered, in the 4th step interpersonal style (dominant, avoidant, angry, insensitive, manipulative, and belittling styles) was entered, self-perception was entered in the 5th step, dissatisfaction with life was entered in the 6th step, and dissatisfaction with interpersonal relationships was entered in the 7th step. The results are given in Table 4.

Age was the only variable that predicted more serious stress-related symptoms (both physical and psychological) in the patient group, explaining 11% of the total variance; it also contributed to the equation significantly ($t = -2.81$, $P < 0.05$). In the second step aggressive behaviors were a significant predictor, explaining 20% of the variance with age, and were a significant contribution on their own ($t = 2.60$, $P < 0.05$). The predictive power of the 2 variables (interpersonal anger and interpersonal style) entered into the analysis in the 3rd and 4th steps was not significant. Self-perception, which was entered in the 5th step had significant predictive power ($t = -2.59$, $P < 0.05$), and together with the other variables helped to explain 28% of the variance in the more serious

stress symptoms scores. Dissatisfaction with life ($t = .80$, $P > 0.05$), which was entered in the 6th step, and dissatisfaction with interpersonal relations ($t = .11$, $P > 0.05$), which was entered in the 7th step, helped to explain 29% of the variance, along with the other mentioned variables, but did not have significant predictive power on their own.

As age had a negative beta in the equation, 3 (age) x 2 (group) ANOVA was performed using stress symptoms as the dependent variable. The analysis showed that the stress symptoms scores in the 18-29-year-old age group were significantly higher than those in the 41-65-year-old age group ($F_{(2, 219)} = 7.74$, $P < 0.001$); the difference was most apparent in the muscular system, emotional system, cognitive system, and immune system scores. Cognitive and immune system differences, disfavoring the younger age group, were also observed in the comparison between the 30-40-year-old age group and 41-65-year-old age group. In addition, the correlations between age and stress symptoms showed that some stress symptoms increased with age. In the patient and control groups the common variables that increased as age decreased (or decreased as age increased) were as follows: emotional system and cognitive system stress-related symptoms, and belittling interpersonal style and anxious anger (the correlations ranging from $r = -.17$, $P < 0.01$ to $r = -.37$, $P < 0.001$); however, in the patient group as age decreased (or increased), muscular system ($r = -.34$, $P < 0.001$) and immune system ($r = -.41$, $P < 0.001$) stress-related symptoms also increased (or decreased). In addition, as age decreased (or increased), total anger score ($r = -.32$, $P < 0.001$), vindictive reactions ($r = -.26$, $P < 0.001$), passive-aggressive reactions ($r = -.29$, $P < 0.001$), and internalization reactions ($r = -.28$, $P < 0.001$) also increased (or decreased). These results suggest to us that the stress-related symptoms in the patients were correlated with their physical illnesses, independent of age.

The demographic variable that predicted less severe stress-related symptoms in the control group was gender, which

Table 4. Variables that predicted stress symptoms score.

	Variables	R	R ²	Adjusted R ²	Beta	t	F Change	F
Patient group	Age	.34	.11	.10	-.34	-2.81*	7.88**	7.88**
	Aggressive behaviors	.45	.20	.17	.30	2.60*	6.78*	7.70**
	Self-perception	.51	.28	.25	-.31	-2.59*	6.68*	7.84***
	Dissatisfaction with life	.54	.29	.24	.10	.80	.63	6.00***
	Dissatisfaction with relationships	.54	.29	.23	-.02	.11	.01	4.72***
Control group	Sex	.38	.15	.14	-.38	-3.82***	14.60***	14.60***
	Aggressive behaviors	.53	.28	.26	.36	3.89***	15.15***	16.09***
	Internalized reactions	.61	.37	.35	.32	3.58***	12.84**	16.52***
	Self-perception	.61	.37	.34	-.03	-.30	.09	12.28***
	Dissatisfaction with life	.64	.40	.37	.19	2.02*	4.10*	11.01***
	Dissatisfaction with relationships	.64	.41	.36	.08	.77	.59	9.23***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

explained 15% of the variance and made a significant contribution to the equation ($t = 3.82, P < 0.001$). In the 2nd step aggressive behaviors made a significant contribution ($t = 3.89, P < 0.001$) and together with gender explained 28% of the total variance. In the 3rd step internalized anger reactions were entered into the equation and made a significant contribution ($t = 3.58, < 0.001$); along with 2 other variables, it helped explain 37% of the variance. Interpersonal styles, which were entered in the analysis in the 4th step, did not have predictive power. Self-perception, which was entered in the 5th step, did not make a significant contribution, but together with the other variables helped explain 37% of the total variance. In the 6th step dissatisfaction with life was entered into the equation, making a significant contribution ($t = 2.02, P < 0.05$) and explaining 40% of the variance. In the 7th step dissatisfaction with interpersonal relationships was entered into the equation without a significant contribution, but helped explain 41% of the total variance with the other 5 variables.

DISCUSSION

The results obtained in the present study are generally in agreement with the literature. Considering the intercorrelations between the study variables, the relationship between stress-related symptoms and anger, and self-perception were as expected. This finding confirms the validity of the assessment instruments used in the present study. Other studies reported that as anger increases and self-perception decreases, stress-related somatic, emotional, and cognitive symptoms increase (Tüzer 1997; Smith et al. 2004). Similarly, be it the way anger is expressed (Begley 1994), or be it the interpersonal style in general, their relationship to stress is in parallel with the findings of previous studies (Martin et al. 1999).

A finding of note in the present study was that the variables that predicted more serious stress-related symptoms in the patient group and milder stress-related symptoms in the control group were similar, only to be in greater intensity in the patient group. These variables were dissatisfaction with current life and relationships, negative self-perception, and aggressive anger behaviors. In the control group internalization of interpersonal anger was also added to these variables. In other words, if an individual is a woman and she is not happy with her current life, relationships, and herself, and if she behaves aggressively when angry, but is internalizing the anger she experiences in interpersonal situations, there is a 40% probability that she might experience mild stress-related physical and psychological symptoms. Similarly, if this person is already a younger patient with a physical illness such as diabetes, gastrointestinal or coronary artery disease, or a dermatological disorder, and is not happy with her current life, interpersonal relationships, and self, and is expressing his/her intense anger with aggressive behaviors, one can predict with 30%

probability that the stress-related physical and psychological symptoms she experiences are more serious. Related findings are found in the literature (Suarez 2006). Nonetheless, it is highly probable that these stress-related symptoms might interact with the symptoms of a specific illness, and exacerbate the condition and complaints of the patient (Surwit and Williams 1996).

The results of the comparison between the patient and the control groups support the above findings. Parasympathetic, sympathetic, endocrine, and immune system symptoms scores in the patient group were significantly higher than those in the control group. The relationship between physical disorders and stress has been reported (Halford et al. 1990). Consequently, the current findings are expected and meaningful findings. Additionally, the present study also shows that interpersonal style in the patient group was significantly more negative than that in the control group. The patients seemed to use dominant, avoidant, angry, insensitive, and manipulative styles in their interpersonal relations. This relationship between physical disorders and interpersonal style was previously reported (Auerbach et al. 2002). Carmody et al. (1989) reported that individuals that are angry and hostile in their relationships, and have a tendency toward type-A behaviors are more susceptible to physical disorders. It was reported that patients with gastrointestinal ulcers have anger and vindictive feelings underlying their passive, agreeable, and soft appearance (Yousfi et al. 2004).

The current study observed that those in the patient group might have been expressing their anger with overt aggressive behaviors. Most studies on the relationship between physical disorders and anger included patients with coronary artery disease (Schum et al. 2003; Bleil et al. 2004). Other studies have reported that internalized anger and physical disorders are correlated (Begley 1994; Vitaliano et al. 1996). In the present study the patient group had significantly higher internalized anger scores.

The present study also observed differences within the patient group in terms of internalized anger, and parasympathetic, cognitive and immune system symptoms scores, according to physical illness. Internalized anger and immune system symptom scores were higher in the patients with dermatological disorders, whereas parasympathetic and cognitive system symptoms scores were higher in the patients with gastrointestinal disorders. It is possible that the more observable problems of the patients with dermatological disorders, might lead them to experience shame and internal conflicts, which might end up in problematic social relations (Verhoeven et al. 2008). This conflicting situation might be related to internalization of anger.

The Parasympathetic System Symptoms Scale includes items related to changes in appetite, nausea, cramps and pains re-

lated to abdominal gas, and heartburn, which are symptoms patients with gastrointestinal disorders complain about. The Immune System Symptoms Scale includes such items as allergic reactions, psoriasis, sores in the mouth, and blisters, which are related to dermatological disorders. Consequently, the higher Parasympathetic System Symptoms Scale scores in the patients with gastrointestinal disorders and the higher Immune System Symptoms Scale scores in the patients with dermatological disorders were expected.

Another variable that differed according to physical illness was cognitive system symptoms. Numerous studies have indicated that our thoughts, feelings, and beliefs affect our physical health (Scherzo et al. 1998; Yousfi et al. 2004). When an individual cognitively interprets a situation as stressful, representing a threat, loss, or danger, the physiological systems in the body start a stress reaction (Şahin 1998). It was reported that individuals with gastrointestinal disorders have more negative perceptions, interpret their situation more negatively, and are more attuned to threatening stimuli than healthy controls (Cheng et al. 2000).

In the present study regression analysis showed that age was a predictive variable for more serious stress-related symptoms in the patient group; however, an unexpected finding was that this age was not old, but younger age. Correlation analysis showed that in both the patient and control groups, as age increased stress-related symptoms, belittling and angry interpersonal styles, and anxious anger behaviors decreased. These findings indicate that there might be another intervening variable related to age. Possible variables might be communication skills and anger management skills, which might improve with age, indicating that it might be beneficial to offer such training in schools.

In contrast to the patient group, variables that predicted the milder stress-related symptoms in the control group were gender and internalized anger. There are several studies that support the disadvantaged status of women when stress is concerned (Ford et al. 2008; Önsüz et al. 2008). It was also reported that anger—when not openly expressed—is internalized and leads to stress symptoms or depression (Şahin 1998).

Based on the present study's findings, those in the patient group generally perceived themselves and their relationships

negatively, and reported experiencing more anger, as compared to the control group. Moreover, the results suggest that self-perception in interpersonal relationships, communication style, and the style with which anger is expressed are interconnected; however, the direction of this relationship is not clear. In other words, we cannot conclude that a person with a negative self-perception, problematic interpersonal style, and high level of anger will develop physical disorders, or that a person that already has a physical disorder has a negative self-perception, problematic interpersonal style, and anger, due to the correlational nature of the study. On the other hand, the finding that the same variables predicted the milder stress-related symptoms in the control group offers a clue to the possible etiological role of these variables in the development of the more serious stress-related symptoms observed in the patient group.

The present study has some limitations. Firstly, the findings are limited by the degree of reliability and validity of the self-report instruments used. Secondly, the participants in the patient group varied in terms of the duration of their treatment. Consequently, we could not control for the medications the patients were using. Future studies should consider these drawbacks.

Nevertheless, the present findings can be used to inform the development of preventive health programs. In this context, psychoeducational programs aimed at fostering a positive self-perception that include anger management and interpersonal communication skills training might be important. In the treatment phase, instead of considering physical disorders as problems related to the body only, treatment protocols might include stress and anger management skills training, self-esteem development, and communication skills training. The present study shows that stress-related symptoms are not limited to physical symptoms; they are also related to the emotional and cognitive systems. As such, prevention and treatment programs might also include cognitive-behavioral emotion-management skills training, as well as relaxation and breathing exercises, and physical exercises used in stress-management programs. While these supportive measures might help alleviate somatic symptoms, they might also aid in preventing psychological symptoms, such as depression and anxiety, which patients might develop during the course of their treatment.

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