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Coping with anxiety in patients undergoing hip replacement

Abstract:

Our research aim was to answer whether temperament traits could predict the anxiety experienced by osteoarthritis patients before and after arthroplasty; we analyzed if coping styles moderated the relationship between temperament and perioperative anxiety, and examined the fluctuation of perceived stress and anxiety.

In the longitudinal study (N=61, mean age 70.9) we measured temperament traits (EAS-A), coping styles (Brief-COPE) and changes of perceived anxiety (STAI) and stress (PSS-10), before and after arthroplasty.

Anxiety and stress decreased significantly after the surgery. Temperament correlated with the anxiety state. Positive correlates were anger, negative affectivity, and fear while negative correlates included sociability and vigor. Regression analyses indicated the predictors of preoperative anxiety which included vigor and negative affectivity. The regression model for the variation of postsurgical anxiety indicated that negative affectivity explained the variance of this variable (R^2=0.57). Moderation analyses confirmed that the temperament and anxiety relationship depended on: active coping, acceptance and planning.

Vulnerable patients with temperamental emotionality and ineffective coping report heightened perioperative anxiety, while effective coping moderates the temperament and anxiety relationship.

Keywords:

anxiety, coping behavior, osteoarthritis, temperament, chronic disease

Streszczenie:

Celem było określenie, czy cechy temperamentu warunkują nasilenie lęku u osób z chorobą zwyrodnieniową stawu biodrowego przed i po endoprotezoplastyce, zweryfikowanie czy style copingu pośredniczą w ewentualnym związku uwarunkowań temperamentalnych z poziomem lęku oraz ocena fluktuacji lęku i stresu.

W badaniu podłużnym (N=61, średnia wieku 70.9) dokonano pomiaru cech temperamentu (EAS-D), stylów radzenia ze stresem (Mini-COPE) oraz zmian w poziomie odczuwanego lęku (STAI) i stresu (PSS-10).

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Nasilenie lęku i odczuwanego stresu istotnie zmalały, cechy temperamentu korelowały z odczuwanym lękiem. Do dodatnich korelatów należały: złość, niezadowolenie i strach; towarzyskość i aktywność korelowały ujemnie. Metodą analizy regresji wyodrębniono predyktory lęku: aktywność i niezadowolenie. Niezadowolenie wyjaśniało znaczny procent wariancji odczuwanego lęku w czasie rehabilitacji (R^2=0,57). Analiza moderacji wykazała, że aktywne radzenie, akceptacja i planowanie wpływały na związek związku temperamentu z lękiem.

Cechy temperamentu mają umiarkowany wpływ na nasilenie lęku okołooperacyjnego, chociaż style zaradcze (planowanie, akceptacja, aktywne radzenie) łagodzą negatywny związek uwarunkowań temperamentalnych z odczuwanym lękiem w badanej grupie.

Słowa kluczowe:

lęk, radzenie sobie, koksartroza, temperament, choroba przewlekła

Introduction

Our paper concerns the influence of coping styles on temperament traits and the level of perceived anxiety in patients with hip osteoarthritis (OA, coxarthrosis, osteoarthrosis) undergoing arthroplasty. Literature on the subject suggests that OA is related to difficulties in everyday functioning, fulfilling life roles, it also combines the disease with the development of premature physical disability, as well as in various mental illnesses (mostly affective, anxiety and adjustment disorders) (Ender, 2005; Dutka et al., 2008; Klimiuk & Kuryliszyn-Moskal, 2012; Talarkowska-Bogusz et al., 2006; Riediger et al., 2010; Badura-Brzoza et al., 2008). A negative relationship between OA with the level of life quality is observed especially in weak and moderately developed countries; where life expectancy is extended, there is an increase in the percentage of older people in those societies, while the budget expenditures for OA treatment are incomparably lower than in developed countries. It seems that some Central European countries, including Poland, are in such a situation, where the double growth of the population above 65 years of age is predicted by 2029, and osteoarthritis particularly worsens among older-age people (Stanisławska-Biernat, 2010; Woolf & Pfeger, 2003).

Restrictions in implementing daily tasks (*daily activities*) and chronic pain (exercise, rest) are two of the more distressing symptoms which may cause patient depression, as well as anxiety reactions, which in a longer perspective heighten the patient's social withdrawal (Ender, 2005; Dutka et al., 2008; Klimiuk & Kuryliszyn-Moskal, 2012; Talarkowska-Bogusz et al., 2006; Blackburn et al., 2012). Patient anxiety and negative experiences connected with the disease causing additional tension is considered as a bad prognosis for the patient's condition in the perioperative period, improvement of life quality after the treatment, and progress in rehabilitation (Riediger et al., 2010; Blackburn

et al., 2012). Additionally, in late adulthood there significantly increases the prevalence of mental disorders including affective, adjustment and anxiety disorders, which are connected not only with experiencing the approaching developmental crisis but with the multi-morbidity and deterioration of living conditions (Małyszczak et al., 2008).

Researchers point out the occurrence of perioperative stress in patients undergoing surgical treatments; this stress may, depending on the nuisance associated with hospitalization and the patient's secondary reactions, hinder the decision about undergoing surgical treatment, worsen the mental state during hospitalization, and reduce tolerance to pain (Blackburn et al., 2012; Feeney, 2004; McKnight et al., 2010).

The interactive model of coping with stress (Fresco et al., 2006) assumes that the range of coping resources is to some extent conditioned by personality traits which might affect the tendency to use specific ways of coping. This model assumes also that the utilization of coping resources, which are constructive from the patient's perspective, may modify the perceived severity of stress and anxiety. Wrzesniewski (2000) defines coping process as the concatenation of strategies (cognitive and behavioral) that may change in time and are determined by numerous factors including psychophysiological states, situations and disposional coping styles. However, Carver and others (1989) claim that the idea of "stable coping dispositions" is "somewhat controversial" (p.270). Apart from coping, the researchers pay attention to perceived social support as a factor supporting mental balance in OA (Luong et al., 2012).

Flexibility in coping may also depend on perceiving the situation as very threatening, which is connected with the cognitive appraisal made by the person facing the stress transaction and evaluation, and whether he or she has sufficient resources to cope with it. It turns out that people with a high intensity of anxiety – understood both as a trait (anxiety as a personal characteristic) and state (anxiety about an event) (e.g. in the case of operational stress) – are less flexible in selecting a strategy (Fresco et al., 2006; Endler, 1997). According to the coping style concept, it may be concluded that the individual with vulnerability to react with anxiety would develop a specific coping pattern.

Previous studies have already assessed the relationship between personality and stress tolerance of OA patients subjected to hip implantation (Badura-Brzoza et al., 2008); however, the dependency between temperamental features and susceptibility to stress and a coping style, as a medium in these conditions, have not been analyzed so far. Evaluating such dependencies could enable more effective therapeutic and rehabilitative adaptations in this clinical population.

Aim of the study

In connection with the reports about the dependencies between temperamental traits and low tolerance to anxiety,, we considered it important to assess coping styles and their influence on the experienced emotions of the patients in the perioperative period and during rehabilitation. Coping might in fact influence the subjectively experienced anxiety and stress, conditioning helplessness and fear, or maintaining the internal locus of control and homeostasis. The basic goal of our paper was, therefore, to evaluate the influence of coping styles between temperament and anxiety before and after total hip replacement (THR), and to determine what the character of this influence is. We hypothesized that if there was a relationship between temperament and perioperative anxiety, this relationship would be moderated by coping styles.

Materials and Methods

Out of 102 patients scheduled for the longitudinal study, eight were ineligible due to poor contact and cognitive problems. Of the remaining 94, 15 declined to participate. Of the 79 who joined the study, 61 subjects (34 women and 27 men) treated for OA, undergoing THR in the age of 57-88 (mean 70.9 ±6.5) completed the posttest examination three months after the THR.

Of all test participants, 57.3% came from a large city above 500 thousand residents, 14.8% came from medium-size cities (50-500 thousand residents), 27.9% from small towns or villages. Most of the patients, 63.9%, did not have secondary education; 26.3% finished education in high school and technical school, 9.8% received higher education. There were slightly more people "strongly dissatisfied" and "somewhat dissatisfied" with the financial situation (32.8%). Approx. 39.3% assessed their own financial situation moderately, 27.9% of the respondents were "rather satisfied" and "definitely satisfied". Neither economic situation, educational background, nor place of residence were related to the psychological indicators (chi-square $p>.05$).

Temperament traits were measured using the adult version of the *Temperament Questionnaire EAS* by A. Buss and R. Plomin. The tool recognizes temperament as a group of inherited personality traits with a relatively constant character. The theoretical base for EAS was the genetic theory of temperament (Oniszczenko, 1997); EAS is self-descriptive, and one of its advantages is its simple structure understood by older people and those less educated. Another advantage is that it takes a short time to administer, which makes this instrument cost-effective. Results in five gradationsfor each of 20 questions, allow the participant to specify the level of: emotionality-distress (discontent), fear, anger, activity and sociability. The respondents rate each item (on the Likert

scale from 1: "not at all characteristic of me", to 5: "very characteristic of me") describing how they consider themselves (e.g., "Usually I seem to be in a hurry"). The questionnaire is reported to have satisfactory psychometric values: the internal reliability coefficients range from 0.57 (sociability) to 0.74 (dissatisfaction).

We determined the patients' coping style by using the shortened version of the *COPE Inventory* (*Brief-COPE*), invented by Carver and adapted by Juczyński (Juczyński & Ogińska-Bulik, 2009a). It is a tool successfully used to study clinical populations due to its good psychometric properties and small patient load during the procedure (28 questions). The tool enables one to evaluate the tendency to use such coping styles as: Active Coping, Planning, Humor, Positive Reframing, Use of Emotional Support, Use of Instrumental Support, Substance Use, Denial, Self-Distraction, Self-Blame, Turning to Religion, Venting, Acceptance, and Behavioral Disengagement. The response reflects the individual's evaluation about how often in general he or she would act in certain ways while experiencing a difficult event, for example, "I turn to work or other substitute activities to take my mind off things". Carver and Scheier constructed their own concept of dealing with stress, but did not discuss whether the individual could modify the coping strategies or could be characterized by a coping style; thus two versions of the COPE tool were developed (situational and dispositional). Alpha Cronbach's coefficients computed in the sample varied from 0.71 to 0.90 excluding venting (0.57) and self-distraction (0.30).

State-Trait Anxiety Inventory (STAI), developed by CD. Spielberger, R.L. Gorsuch and R.E. Lushene, is a worldwide tool used to examine anxiety understood as a generalized predisposition to experiencing tension. It also tests situational anxiety of a temporary nature. Each of two scales consists of 20 questions, where the respondent evaluates on a four-point rating scale (from 1: "not at all", to 4: "very much so") the degree of worry, tension, fear, lack of security and other symptoms of anxiety, for example, "I feel comfortable". The higher the obtained result (in the range of 20 to 80), the higher the intensity of state anxiety or trait anxiety. The latest Polish validation was performed by Wrześniewski and others (2011). Satisfactory internal reliability alpha coefficients (0.84-0.94) were computed in the Polish validation (Wrzesniewski et al. 2011). Trait anxiety was measured to compare the magnitude of patients' temporary anxious reactions with their dispositional anxiety. However, the main focus was laid on the relationship between temperament and state anxiety moderated by coping.

Stress experienced by the patients was measured using the *Perceived Stress Scale (PSS-10)* created by S. Cohen and others (1983) and consisted of ten questions in a five-point Likert scale. The questionnaire, in the Polish adaptation by Juczyński and Ogińska-Bulik (2009b), is a short form of the evaluation of subjective feelings connected with personal events and issues during the previous month. The person indicates his or her

judgments by circling the frequency of his or her feelings or certain thoughts, for example, "In the last month how often have you been able to control irritations in your life?" The general result (0-40) reflects the intensity of the perceived stress. The derived alpha Cronbach's values in the sample ranged from 0.87-0.90 (negative and positive statements) in the pretest and from 0.82-0.88 (negative and positive statements) in the posttest.

Statistical methods

Statistical methods included Pearson's correlation, linear regression followed by a one-way analysis of variance for comparing the results between subjects. Consequently, we tested the presence of moderator effects in the relationship between temperament and state anxiety. In order to do so, we performed the multiple regression model advocated by Baron and Kenny (1986) so that we could investigate whether the association between temperament and anxiety depends on coping styles. We performed simple-slopes analyses to show in plots how coping affected the relationship between temperament and presurgical anxiety.

Results on scales of temperament, anxiety, perceived stress and some dimensions of coping with stress reached normal distributions; therefore there were applied analyses with parametric tests and r-Pearson correlations. Results of other stress coping scales were assessed by using rho-Spearman rank correlations and non-parametric tests.

Procedure

We conducted the study in the Clinic of Orthopedics, Traumatology and Post Traumatic Rehabilitation of the Military Teaching Hospital in Lodz after obtaining the positive opinion of the Committee of Bioethics. Inclusion criteria were: referral for THR surgery due to OA, qualification to the treatment for the first time (people with revision did not participate in the study), total contact with the examinee. We assessed the patients by administrating self-report questionnaires in two time points: the day before implantation and three months after the treatment, during orthopedic rehabilitation.

Psychological variables were measured with standardized questionnaires validated in Poland. We provided the patients with the program's goals and obtained written consent prior to participation. We interviewed and collected the subjects' data with a trained psychologist.

Results

A high level of anxiety (sten score of more than 6) before surgical treatment was noted in 57.4% of the sample (32.8% after treatment). With regard to the percentage of respondents with high generalized anxiety, which was 27.9%, both situations taken into consideration in the test were connected with an increased intensification of reactive anxiety. It was especially clearly manifested in the preoperative period. A high stress level (sten score of more than 6) measured with the PSS scale was noted before surgery in 21.3% of the sample and in 19.7% after the prosthetic implantation. Average results obtained in psychometric tests are presented in Table 1. Females reported higher preoperative anxiety and trait anxiety. According to the instrument, males were known to display lower scores in self-reported anxiety; however, the differences between subjects were no longer valid once they were adjusted to the standard sten score.

Table 1. Average results in temperament, anxiety and perceived stress scales in patients with OA.

Variable	Scores			
			N (61)	
	F n=34	M n=27	Mean	σ
Dissatisfaction[1]	9.71	9.22	9.49	3.44
Fear[1]	11.15*	9.33*	10.34	3.40
Anger[1]	9.53	9.78	9.64	2.89
Vigor[1]	10.18*	11.70*	10.85	2.73
Sociability[1]	13.74	12.63	13.25	3.08
Trait anxiety	44.38*	37.93*	41.53	11.57
State anxiety before surgery	50.41*	43.89*	47.52	11.07
State anxiety after surgery	40.06	37.81	39.07	11.77
Stress before surgery	16.21	13.52	15.02	7.17
Stress after surgery	15.21	13.04	14.25	6.54

*Difference of average results between F and M ($p<0.05$).

[1]Temperament dimensions measured by EAS-A scale.

The next step was to determine the relations between temperamental features, and the severity of reactive anxiety before THR, which allowed us to define whether biologically conditioned personality traits that increased vulnerability to experience negative emotions existed before THR. Analysis of correlations indicated significant dependencies ($p<0.01$) between scales of Dissatisfaction ($r=0.80$), Fear ($r=0.61$), Anger ($r=0.47$), Activity ($r=-0.39$) and Sociability ($r=-0.41$), and preoperative anxiety. Similarly, statistically essential relations occurred in cases where there was state anxiety after treatment: Dissatisfaction ($r=0.76$), Fear ($r=0.59$), Anger ($r=0.43$), Activity ($r=-0.32$), Sociability ($r=-0.49$). These EAS scales are complementary and create a comprehensive profile of

temperament, and therefore were included in linear stepwise backward regression analysis, explaining the changeability of situational anxiety in the sample. Models 1 and 2 described predictors of preoperative anxiety, while models 3 and 4 described predictors of postoperative anxiety. Results of regression analysis (models 1 and 3) showed that preoperative and postoperative anxiety is determined by sensitivity to stimuli causing dissatisfaction and difficulty in maintaining self-control. Alternative models (2 and 4), which did not include dissatisfaction in analyses, showed that the tendency to react with fear and to manifest anger and aggression moderately explained the variance of preoperative anxiety.

Table 2. Linear regression models characterizing the change in anxiety before and after THR.

Model	Dependent variable	Adjusted R^2	Predictors	Beta	Standardized β	T	p
1	STAI-S pretest	0.67	Dissatisfaction	2.41	0.75	9.85	<0.0005
			Activity	-0.83	-0.21	-2.70	<0.01
		Constant		33.65		7.31	<0.0005
2		0.50	Fear	1.52	0.47	4.73	<0.0005
			Anger	1.30	0.34	3.63	<0.01
			Activity	-0.85	-0.21	2.18	<0.05
		Constant		28.5		4.18	<0.0005
3	STAI-S retest	0.57	Dissatisfaction	2.61	0.76	9.05	<0.0005
		Constant		14.32		4.93	<0.0005
4		0.42	Fear	1.78	0.51	5.05	<0.0005
			Anger	1.27	0.31	3.08	<0.01
		Constant		8.41		1.72	0.09

Model 1: $F=62.63$, $p<0.0005$; Model 2: $F=21.15$, $p<0.0005$; Model 3: $F=81.83$, $p<0.0005$; Model 4: $F=22.31$, $p<0.0005$.

Since dissatisfaction turned out to be a significant predictor of pre- and postoperative anxiety in the examined group, as well as results of dissatisfaction that strongly correlated with anxiety, the evaluation of coping styles was performed among three groups depending on the severity of vulnerability to react with dissatisfaction. The results on EAS-A dissatisfaction transformed into a sten scale (low, medium high sten scores) were the criterion of categorization. A more apparent predisposition to task-oriented and active coping through planning, plus manifesting a positive revaluation is visible in people with low dissatisfaction. Patients with high dissatisfaction were characterized with the coping styles focused on: venting, self-blame, denial, substance use (Table 3).

Table 3. Mean values of coping styles and level of dissatisfaction (variance analysis and post-hoc).

	1 Small Dissatisfaction N=18		2 Average Dissatisfaction N= 30		3 High Dissatisfaction N=13		Intergroup comparisons			Post-hoc (for F) In Mann-Whitney (for H) Group numbers		
Brief-COPE	M	SD	M	SD	M	SD	P	F	H	1-2	2-3	1-3
AC	5.22	0.94	4.60	1.07	3.31	1.38	***	11.49		NS	**	***
PR	4.17	1.38	3.33	1.80	1.92	1.19	**	7.68		NS	*0.03	**
V	1.28	0.90	1.83	1.21	2.92	1.32	**	7.83		NS	*0.02	**
SB	1.11	0.90	2.27	1.39	3.46	1.33	***	13.45		*0.01	*0.02	***
P	4.89	0.90	4.40	1.25	3.38	1.39	*0.01		9.28	NS	*0.03	**
D	0.56	0.86	1.40	1.40	3.00	1.73	***		15.37	*0.03	**	***
SU	0.22	0.55	0.87	1.20	2.38	1.90	***		15.41	*0.01	*0.01	**

AC-Active Coping; **PR**-Positive Reframing; **V**-Venting; **SB**-Self-Blame; **P**-Planning; **D**-Denial; **SU**-Psychoactive Substance Use; $p<0.05$*, $p<0.01$**, $p<0.0005$*** NS-statistically insignificant.

Correlation analysis allowed us to identify the coping styles mostly associated with perceived stress and preoperative anxiety. R-Pearson and rho-Spearman coefficients for the relationship between preoperative anxiety and coping among women showed that the strongest significant ($p<0.01$) relations occurred for: Denial (rho=0.87), Self-Blame (r=0.73), Behavioral Disengagement(r=0.73), with the strongest negative relation obtained for Positive Reframing (r=-0.62). In the tested group of males, main correlations ($p<0.01$) were as follows: Active Coping (r=-0.60), Behavioral Disengagement (r=0.59) and Self-Blaming (r=0.56). Coefficients values indicated that the intensity of correlations was lesser in males, while the direction of relationships was the same as in females.

In order to verify the hypothesis about the moderating role of coping, we performed a linear regression, as aforementioned in the statistical analyses section. It turned out that the character of changeability between temperamental traits and the level of experienced state anxiety before surgery depended on the intensity of particular coping ways. Figure 1 presents the directly proportional dependencies between temperament traits and anxiety, where the moderator influenced the proportional change. Simple slopes for the association between temperament and preoperative anxiety were tested for low (-1 S.D. below the mean), moderate and high (+1 S.D. above the mean) levels of coping style. One standard deviation below and above the mean for predictor and moderator was used to plot the variables and to test the statistical significance for each of the simple slopes. For instance, in Figure 1 (A) it is suggested that active coping is a significant moderator of the relationship between dissatisfaction and preoperative anxiety. The higher the results

reported on active coping, the weaker the relationship between dissatisfaction and preoperative anxiety. Preoperative anxiety was less related to emotionality when it came to high levels of planning (Figure 1 C). The tendency toward coping with accepted difficulties reinforced the negative relationship between sociability and state anxiety (Figure 1 B).

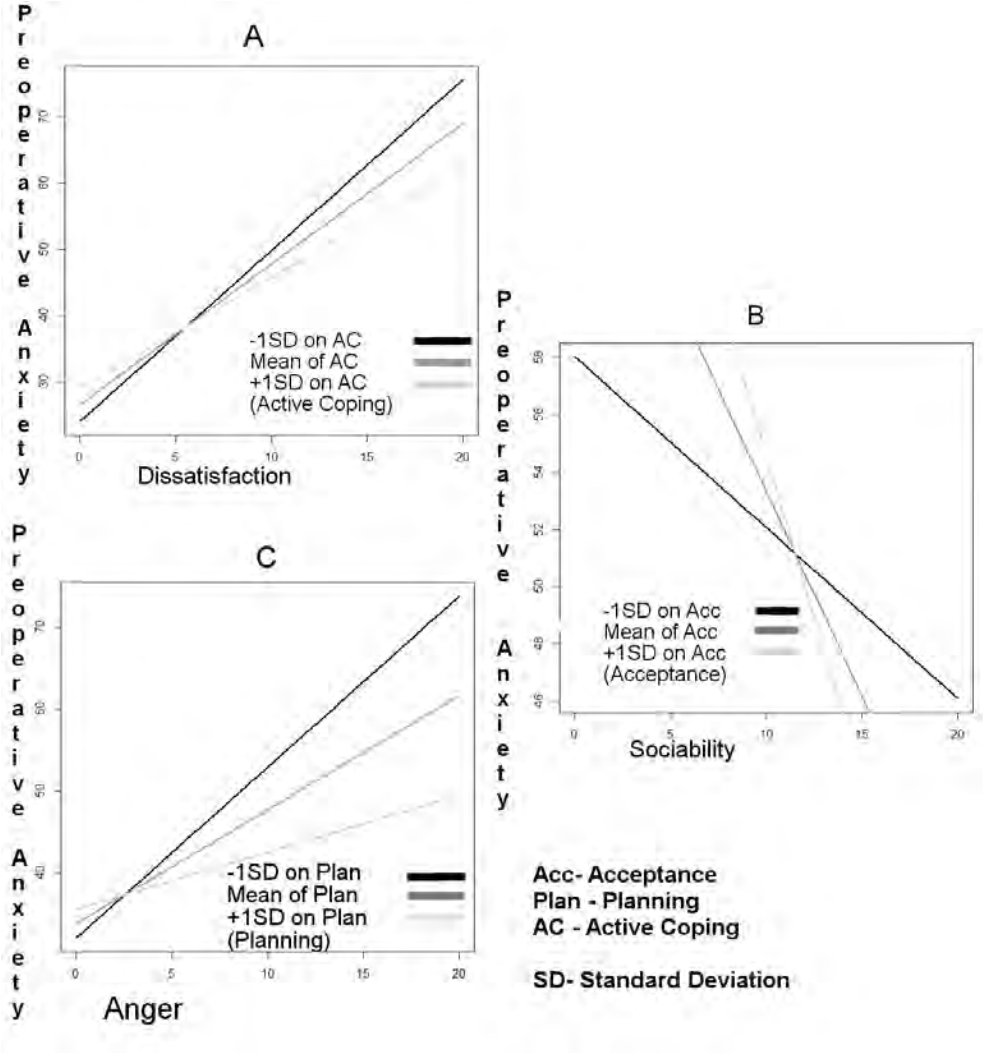

Figure 1. Relationship between temperament and preoperative anxiety moderated by coping.
A: Independent variable: dissatisfaction, moderator: active coping;
B: Independent variable: sociability, moderator: acceptance;
C: Independent variable: anger, moderator: planning.

The regression equations including moderation were constructed according to the guidelines proposed by Baron and Kenny (1986). The dependent variable was perioperative anxiety, while the independent variables were the temperamental traits. The moderators included the coping styles, measured by the Brief-COPE.

Table 4. Regression analyses between temperament and anxiety moderated by coping.

Temperament trait[1]	Moderator	Independent variable	Moderator	Interaction[3]	R^2	F	p
State Anxiety before THR[2]							
Dissatisfaction[1]	Active Coping	1.16***	0.23	-0.47*	0.68	43.8	<0.005
Anger[1]	Planning	0.97**	0.16	-0.86*	0.50	20.73	<0.005
Sociability[1]	Acceptance	0.22	0.86	-1.30*	0.17	5.08	<0.005
State Anxiety after THR[2]							
Dissatisfaction[1]	Behavioral Disengagement	1.28***	0.74**	-0.90**	0.62	33.02	<0.005
	Planning	1.26***	0.34	-0.66*	0.66	39.65	<0.005
Anger[1]	Behavioral Disengagement	0.90***	0.96*	-1.01*	0.23	6.83	<0.005
	Planning	0.94**	0.17	-0.84*	0.45	17.39	<0.005

[1]Independent Variable
[2]Dependent Variable [3]Interaction between independent variable and moderator
$p<0.05$* $p<0.01$** $p<0.0005$***

The results of multiple regression analyses indicated that interaction between temperament and perioperative anxiety was moderated by coping styles. We observed that high scores in planning minimized the level of anxiety after the surgery in patients with a tendency to experience negative emotionality (anger or dissatisfaction).

The stronger the severity of negative emotionality in patients (high scores on the anger and dissatisfaction scale), the more intense anxiety they experienced three months after the arthroplasty. The described association moderated by behavioral disengagement weakened the relation (Table 4).

Discussion

The average level of preoperative anxiety in patients with hip OA was found to be high. Referring to the findings of Gammon (1996), one of the ways to reduce anxiety is to provide OA patients with outpatient clinic staff who have psychological re-education and health education. This may prepare the person both mentally and emotionally to function better in the following procedures. These actions focussing on developing a patient's personal resources are considered to enhance his or her behavior physically and psychologically, namely, they may lead to pain reduction(McKnight et al., 2010). Another observed regularity connected with anxiety is the relatively long time of waiting for surgical treatment, which was reported by a considerable part of the participants and is treated as a systemic problem (Dutka et al., 2008). According to data obtained in interviews, the patients stated that the fact of waiting caused their frustration and anger, but

on the other hand, paradoxically, some felt relief connected with the end of this difficult period. This could partially distract attention of the hospitalized from preoperative anxiety.

State anxiety studies indicate that it results from the individual's dispositions and situational variables; thus there is no clarity as to the adaptability of coping style values (Luong et al., 2012; Endler, 1997; Smith & Wallston, 1996). It seems that the results presented by the authors confirm certain positive aspects of task-oriented coping and the orientation to give positive meaning to difficulties. King and others emphasize that sick people who treat their condition as a challenge can achieve a higher level of adaptation (King et al., 2003). Coping styles have properties that may catalyze the influence of personality predisposition on the reaction with anxiety states, which was also revealed in the reports by Ziarko and others with reference to neuroticism (Ziarko et al., 2011). Neuroticism in the Big-Five paradigm and emotionality in the Buss & Plomin theory seem to have similarities in describing characteristics of human behavior, despite differences in explaining its foundation (Ormel et al., 2012). The results that Ziarko andothers (2011) obtained, showing the positive relationship between neuroticism and situational anxiety in patients with arthritis, can be interesting, considering the present study. These authors have also observed that arthritic patient neuroticism was not related to anxiety anymore if it was controlled (mediated) by coping styles: avoidance-oriented coping and social distraction. Their finding suggests that avoidance orientation could be advantegous; however, in our sample we did not confirm the moderating effect of any avoidance-oriented style (behavioral disengagement, self-distraction) that would be either positive or negative with respect to state anxiety. In contrast, we have found that the emotionality-anxiety relationship might be weakened by a disposition to use planning and active coping. This disparity could be that we used different paradigms (temperament vs. personality), diverse instruments to measure coping (Brief-COPE vs CISS Coping Inventory in Stressful Situations), and the patients were dealing with different types of stressors (a rather short term stressful event related to the illness vs a long-term illness). Even so, avoidance-oriented coping among individuals with degenerative joint disease is argued to bring negative foresight (Benyon et al., 2010).

Besides coping styles, there are many other important psychological variables influencing the outcome. The network of social support as well as personal resources together with self-efficacy were found to determine patient functioning. Low self-efficacy is considered a predictor of the patient's entry into the role of a disabled person due to a lack of faith in their own abilities, low motivation for change and greater vulnerability to mood disorders (Miller & Cronan, 1998).

Evidently, a number of participants reported a heightened level of psychological stress before surgery and at the middle-stage of rehabilitation, which was self-reported

in more than 20% of the sample. Although the intensity of distress decreased slightly after THR, the results suggest that end-stage OA patients generally displayed long-term difficulties in everyday living so that they might be exposed to negative outcomes. Heijmans and colleagues' (2001) observations confirmed that stress accompanying OA is an important struggle faced by patients.

A policy for an OA patients' mental health once theyqualify for arthroplasty should be considered, starting from the moment of properly communicating the need for surgery. Secondly, there is a substantial patient management issue including controlling his or her stress during hospitalization. Finally, the patient's motivation to undertake actions for recovery during rehabilitation should be facilitated. Intervention and prevention programs should be based on different theoretical models, usually assuming active patient coping and plann-oriented coping (Klimiuk & Kuryliszyn-Moskal, 2012; Feeney, 2004). Some interventions consider selected dispositional variables, such as searching-avoiding-information (Case et al., 2005), and indicate alternative recommendations depending on the individuals' dispositions and preferences.

Etiology of OA is ambiguous, and degenerative joint changes may be slightly delayed; therefore it is recommended limiting the number of risk factors (e.g. obesity) (Klimiuk & Kuryliszyn-Moskal, 2012). Generally, it may be acknowledged that the patient suffering from coxarthrosis struggles with a chronic disease, where the development of somatic symptoms are not possible to be restrained. It seems difficult in cases of people with high internal loci of control and task-oriented coping. Reports from some studies indicate low controllability in stressful situations and maladaptive patterns of coping in some patients (Endler, 1997). Patients with a problem-oriented coping style may suffer increased psychological costs, if their actions are not accompanied by improvement in health. A study by Smith and Wallston (1996) of osteoarthritic patient profiles revealed that a percentage showed a tendency to blame themselves, which could be the consequence of an incorrect assessment.. Our results might explicate this issue. We found that emotionality differentiated patients regarding coping styles (subjects with negative emotionality were oriented toward self-blame but also toward denial). Analyses performed by Connor-Smith and Flachsbart (2007) have shown that personality traits predict moderately dispositional coping; to be more accurate, neuroticism focuses on negative emotions (including self-blame). Our findings regarding the linkage between negative emotionality and denial may indicate that they show type C (denying negative emotions) or, in some instances, type D symptoms (negative affect, repression of negative emotions, self-blame). The combination of negative emotionality, denial and self-blame can therefore have psychosomatic outcomes; hence this problem seems to deserve further exploration.

Another group of coping patterns concerns concentration on emotions. Miller reports that emotional coping is connected with negative adaptation, in the form of anxiety and depression disorders and maladjustment to the disease (Miller & Cronan, 1998). It is believed that a person focuses on difficult emotions in crises and situations where disease is a common phenomenon (Endler, 1997). In conclusion, results of studies concerning relations between coping and mental states in somatically ill patients are inconclusive, although it seems that the task-oriented style brings relatively modest benefits (McKnight et al., 2010; Miller & Cronan, 1998).

Generalizing the results of the study group should be done with care, as an elderly person's emotionality depends on many other factors. Moreover, a significant variable conditioning mental discomfort is the intensification of pain and mobility due to the disease (Talarkowska-Bogusz et al., 2006). An additional difficulty was how to hinder contact with many people, for whom participation in this type of study could be fatiguing. The study group was a small section of the population, and therefore the characteristics of the sample allowed us only to make initial generalizations, especially with regard to the elderly who were in an advanced stage of OA and who experienced difficulties associated with surgical treatment and then with a long-term rehabilitation. Undoubtedly, comparing the general results of a heterogeneous group of males and females in most of our findings was the limitation. This weakened the observed tendencies and did not bring answers related to particular gender groups regarding the moderating effect of coping styles.

To conclude, our paper discussed whether temperament traits determine the severity of anxiety directly before THA and during rehabilitation. It concluded that the intensity of stress and anxiety decreased after the treatment regardless of personality traits; however, it remained prevalent in a fraction of patients. We have shown evidence that planning and an active coping style will moderate the negative influence of temperament traits to the level of anxiety in the study group.

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