Clinical Trial/Experimental Study

Medicine®

OPEN

Affective temperament does not influence satisfaction after total knee arthroplasty

Mahmut Özdemir, MD[a], İsmail Demirkale, MD[a,*], Hakan Şeşen, MD[a], Anıl Taşkesen, MD[a], Mustafa C. Okkaoğlu, MD[a], Murat Altay, MD[b]

Abstract

Background: Inherent temperament of the patient may predict the outcome of the surgical procedure. The purpose of this study was to ascertain whether negative affective temperament affects patient satisfaction and outcome measures.

Methods: This prospective study included 143 patients who underwent total knee arthroplasty for primary arthrosis. Preoperatively, the Memphis, Pisa, Paris and San Diego-Auto questionnaire was used to define the temperament of the patient. Knee Society Score (KSS) and short form-36 (SF-36) outcome measures were used to evaluate the functional outcome.

Results: No relationship was determined between temperament and satisfaction ($P = .734$). Overall, the satisfaction rate of the procedure in our patients was 93%. The KSS improved from a mean of 47.9 to 70.1 ($F = 124.275$; $P^a < .05$) and the SF-36 physical component summary, and SF-36 mental component summary scores improved to a mean of 39.5 and 43.04 points, respectively.

Conclusion: Temperament was not found to have any effect on patient satisfaction. However, patient satisfaction was directly related to better functional outcomes.

Abbreviations: KSS = Knee Society Score, MCS = mental component summary, PCS = physical component summary, SF-36 = short form-36, TEMPS-A = the Memphis, Pisa, Paris and San Diego-Autoquestionnaire, TKA = total knee arthroplasty.

Keywords: knee, osteoarthritis, satisfaction, surgery, temperament

1. Introduction

Total knee arthroplasty (TKA) is known to effectively relieve the symptoms related to osteoarthritis of the knee. There are many early reports of TKA defining the effectiveness of the procedure, which is certainly true from the radiological perspective. However, studies that have focused on the overall patient satisfaction and standardized outcome measures have identified patients dissatisfied with the functional outcome.[1–3]

There is a plethora of studies that have assessed the effect on outcome of the procedure of patient selection,[4] avoiding preventable complications, and proper surgical technique.[5–8] These factors provide the surgeon with a controlled environment, which will hopefully optimize not only the safety of the operation but also increase the rate of patient satisfaction. In addition, preoperative patient expectations have been shown to correlate with postoperative results with elevated and diminished expectations appearing to result in superior and inferior postoperative outcomes, respectively.[2,9] If patient expectations for surgery are met and whether this translates into satisfaction after surgery is important in our role as surgeons.[3] Therefore, in order to meet these expectations, the patient must be willing, informed, and prepared for a potentially long journey paved with hazards such as pain, stiffness, infection, and loosening.

A preoperative psychological assessment (mental status, compliance, and social environment) together with inherent temperament may determine if the patient is suitable for the proposed surgery or predict the outcome of the procedure.[10] Temperament refers to individual differences in conditioned emotional responses, such as anger, fear, and disgust.[11] This study is the first to investigate the effect of temperament on patient-reported outcomes after a major orthopedic procedure. The aim of the study was to evaluate the effect of the temperament dimensions of the patients on the outcome of TKA. The hypothesis was that negative affective temperaments such as a depressive or anxious temperament would substantially affect the patient-reported outcomes. The primary questions were as follows: Is there any difference among negative, positive, and nondominant affective temperaments with regard to patient satisfaction? Is there concordance between temperament dimensions and outcome measures after TKA?

2. Materials and methods

2.1. Design

This prospective cohort study (Level II therapeutic) was conducted on patients scheduled for TKA. Patients that accepted

Editor: Massimo Tusconi.

Ethical review committee statement: Approved.

The study was performed at Keçiören Education and Research Hospital, Ankara, Turkey.

The authors have no conflicts of interest to disclose.

[a] Departments of Orthopaedics and Traumatology, Keçiören Education and Research Hospital, Ankara, [b] Departments of Orthopaedics and Traumatology, Karabük University School of Medicine, Karabük, Turkey.

[*] Correspondence: İsmail Demirkale, Departments of Orthopaedics and Traumatology, Keçiören Education and Research Hospital, Pınarbaşı M Ardahan S 25 Keçiören, 06380 Ankara, Turkey (e-mail: drismail@yahoo.com).

Medicine (2017) 96:19(e6852)

Received: 12 January 2017 / Received in final form: 12 April 2017 / Accepted: 17 April 2017

http://dx.doi.org/10.1097/MD.0000000000006852

TKA were recruited to the study between November 2014 and November 2015. The treatment consisted of 3 consecutive phases: preoperative determination of temperament, postoperative first month evaluation, and third month evaluation of patient satisfaction and outcome measures. The preoperative temperament assessment of the patients was made using the Memphis, Pisa, Paris, and San Diego-Autoquestionnaire (TEMPS-A).[12]

2.2. Participants

Participants were eligible if they had primary osteoarthritis of the knee. The sample consisted of subjects' resident in the province of Ankara who were retired (30.7%), unemployed (31.4%), or housewives (37.9%). Throughout the study period, a total of 381 patients were operated on with the diagnosis of primary osteoarthritis of the knee.

Patients were excluded due to previous arthroplasty in the contralateral joint (n=36), previous surgery on the same joint (n=3), a diagnosis of lumbar discopathy (n=13), psychiatric disorder (n=5), inflammatory arthritis (n=11), refusal to participate in the study (n=3), or illiteracy in Turkish (n=2).

Thus, a total of 308 patients completed the TEMPS-A auto questionnaire. The results of the autoquestionnaire revealed that 188 patients had nondominant, 12 had cyclothymic, 11 had irritable, 31 had anxious, 32 had depressive, and 34 had hyperthymic temperament features. Patients were also not included in the final analysis due to lost to follow-up (n=6), postoperative radiological findings were not suitable (n=5), postoperative deep infection developed (n=3), and mortality (n=1).

A priori power analysis of the data with repeated measures was performed. Assuming an average group difference of 2 points over time in the satisfaction scores to be clinically significant, a study with a sample size of 30 patients would yield a power of 80% at the 0.05 alpha level. Finally, patients with cyclothymic (n=12) and irritable (n=11) temperaments were excluded, and a total of 143 patients with a mean age of 66.7 years, comprising 121 females and 22 males, were evaluated. Group I consisted of patients with anxious temperament (n=30), Group II consisted of nondominant temperament (n=50), Group III consisted of depressive temperament (n=31), and Group IV consisted of patients with hyperthymic temperament (n=32). The 4 groups were comparable in respect of the main demographic findings (Table 1). Of the total group, 86.7% were married, and 13.3% were separated or divorced. The majority (72.7%) had elementary school level of education, 16.1% had completed high school, and 11.2% had a university degree.

Table 1

Patient demographics.

Variables	Group 1	Group 2	Group 3	Group 4
Age	66.8 (53–88)	67.3 (43–83)	65.9 (49–85)	66.5 (51–82)
Gender	27 F, 3 M	41 F, 9 M	28 F, 3 M	25 F, 7 M
Job				
Retired	8	15	13	8
Unemployed	8	14	11	12
House wife	14	21	7	12
Marital status				
Married	25	42	27	30
Divorced	5	8	4	2
Education				
Elementary	22	39	19	24
High school	6	6	6	5
University degree	2	5	6	3

2.3. Procedures

This study was undertaken after approval from the Institutional Review Board. All patients were operated on with the same surgical technique using cemented bicompartmental TKA without patellar resurfacing (Biomed, Warsaw, IN). Of these implants, 112 were cruciate retaining and 31 were cruciate substituting prosthesis. The same prophylaxis protocol against infection and embolism and the same postoperative rehabilitation program were applied to all patients.

2.4. Outcome measures

The TEMPS-A evaluations were applied to all the willing participants by 2 of the authors (ID and MO). Preoperatively, the patients completed the Turkish version of the self-report TEMPS-A, which includes depressive, cyclothymic, hyperthymic, irritable, and anxious subscales. The TEMPS-A auto questionnaire has 110 constituent items and has been shown to be a reliable and valid instrument that elicits information about traits in the whole life of the subject.[12] Previous item analysis indicated that 10 items had alpha values of <0.2.[11] Some were sleep-related items, and others were social desirability items. These items were deleted from further consideration in the final 100-item questionnaire TEMPS-A, Turkish version. A researcher blinded to the temperament of the patient evaluated the satisfaction and Knee Society Score (KSS) and short form-36 (SF-36) scores of the patient. Patient satisfaction was determined using a Likert 5-point scale.[13] Patients were asked whether they were satisfied with the procedure and scored 5 points for highly satisfied, 4 points for satisfied, 3 points for somewhat satisfied, 2 points for not satisfied, and 1 point for patients whom were strongly dissatisfied with the procedure. Functional evaluation was applied with the use of the SF-36 and KSS systems.[14]

2.5. Statistical analysis

All statistical analyses were performed using SPSS version 11.5 (IBM Corp., Armonk, NY). Normal distribution of the data was validated using the Shapiro–Wilk test. For categorical data, the χ^2 test was used. The paired t test was used to evaluate the differences in mean preoperative and postoperative KSS scores in the satisfaction groups. Correlation analyses were performed, and the Pearson correlation coefficient was used to evaluate the relationship between temperament groups and patient satisfaction. For all comparisons and regressions, statistical significance was set at the level of $P<.05$.

3. Results

Mean follow-up was 17.1 ± 6.0 months (range, 12–24 months). At the 12th month follow up, both KSS and SF-36 scores yielded significant improvements. The KSS improved from a mean of 47.9 to 70.1 ($F=124.275$; $P^a<.05$), and the SF-36 physical component summary (PCS) and SF-36 mental component summary (MCS) scores improved to a mean of 39.5 and 43.04 points, respectively. Likewise, patient satisfaction was perfect; the mean satisfaction rate of the whole patient group was 4.25 points (4.3, 4.24, 4.3, and 4.15 for groups 1–4, respectively). Of these, 76 (53.1%) were highly satisfied, 39 (27.3%) were satisfied, 18 (12.6%) were somewhat satisfied, 8 (5.5%) were not

Table 2

The mean KSS and SF-36 scores and patient satisfaction.

Groups	KKSp	12th KSS	KSSd	SF-36PCS	SF-36MCS	S
1	46.8	68.4	21.3	33.8	44.07	4.3
2	49.22	72.34	23.3	39.5	42.9	4.24
3	46.26	69.2	21.96	34.6	42.2	4.3
4	48.06	69	20.8	37.3	43.03	4.15
Total	47.9	70.1	22.2	39.05	43.04	4.25

3rdKSS KSS = third month KSS, KSS = Knee Society Score, KSSd = the difference between preoperative and postoperative KSS scores, KSSp = preoperative KSS, MCS = mental component summary, ND = nondominant, PCS = physical component summary, S = satisfaction, SF-36 = short form-36.

satisfied, and 2 (1.39%) patients were strongly dissatisfied with the procedure. Overall, the satisfaction rate of the patients with the procedure was 93% (Table 2).

Apart from the high satisfaction rate and noticeable improvement in functional scores (Fig. 1), there was no statistically significant relationship between temperament feature and satisfaction grade ($P=.734$). The evaluation of satisfaction in the different temperament groups showed that the most satisfied patients were in Group 3 (depressive temperament, 96.8%), and the least were in Group 1 (anxious temperament, 90%) (Table 3).

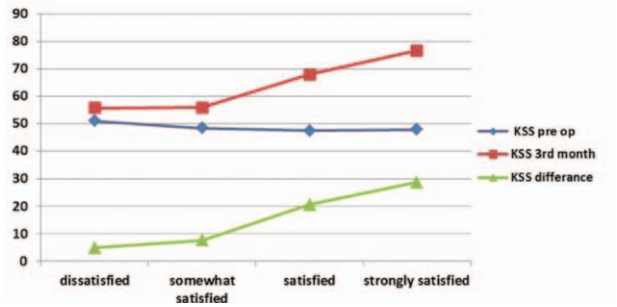

Figure 1. The relationship between satisfaction and functional outcome.

When all the parameters of the SF-36 were evaluated regardless of the temperament groups, all the subscales of the SF-36 were closely correlated, although the SF-36 provided independent results with regard to temperament (Table 4) ($P>.05$).

There was an 83.1% strong, direct, positive, and statistically significant correlation between the KSS and SF-36 PCS scores and a 63% moderate, direct, positive correlation between the KSS and SF-36 MCS scores (Table 5) ($P<.05$).

4. Discussion

TKA is a satisfactory procedure for relieving pain and improving function. Although excellent satisfaction rates have been reported, a small group of patients have been found to be dissatisfied regardless of satisfactory radiological outcome. The fine line between patient satisfaction and radiological findings requires detailed and careful studies to understand this lack of concordance.[15] There is current interest in the influence of psychological factors such as depression and anxiety on the outcome of major joint replacements, although the influence of temperamental traits on outcome has not been previously evaluated. In a study of undergraduate students, Morvan et al[16] showed that cyclothymic, irritable, and dysthymic temperaments were associated with depressive and anxiety symptoms. Thus, it can be expected that the above-mentioned

Table 3

The relationship between satisfaction and affective temperament.

Groups	SD (n/%)	D (n/%)	SwD (n/%)	S (n/%)	HS (n/%)	*P*
1	1/3.3	2/6.6	3/10	5/16.7	19/63.3	
2	0/0	4/8	6/12	14/28	26/52	
3	0/0	1/3.2	3/9.7	12/38.7	15/48.4	.734
4	1/3.1	1/3.1	6/18.8	8/25	16/50	

D = dissatisfied, HS = highly satisfied, S = satisfied, SD = strongly dissatisfied, SwD = somewhat dissatisfied.

Table 4

The relationship between SF-36 scores and patient satisfaction.

	Highly satisfied	Satisfied	Somewhat satisfied	Dissatisfied
SF-36 PCS	41.8	35.2	25.8	23.2
SF-36 MCS	48.3	39.2	34.7	31.9
Physical functioning	70.9	58.7	28.3	23.5
Physical role functioning	81.6	69.2	43.2	35
Bodily pain	67.1	55.8	30.3	26.8
General health perceptions	69.8	60.3	53.3	47.8
Vitality	66.7	54.2	36.9	35
Social role functioning	74.3	63.9	43.1	42.5
Emotional role functioning	92.1	81.1	66.6	53.1
Mental health	76	60	40.8	39.2

MCS = mental component summary, PCS = physical component summary, SF-36 = short form-36.

Table 5

The correlation between SF-36 and KSS scores.

		SF36-PCS	SF36-MCS
KSS-pre op	Pearson correlation	.068	.031
	P	.423	.712
	N	143	143
KSS-3rd month	Pearson correlation	.831*	.630*
	P	.000	.000
	N	143	143
KSS difference	Pearson correlation	.679*	.576*
	P	.000	.000

KSS = Knee Society Score, PCS = physical component summary, SF-36 = short form-36.
* Statistically significant and positive correlation.

temperaments together with depressive and anxious temperaments could be associated with a variety of negative outcomes in daily life.[11] Therefore, the aim of this study was to determine whether depressive and anxious temperaments influenced the outcome of TKA. It was hypothesized that depressive and anxious temperamental features would negatively influence the outcome of TKA. However, the results of the study, which was the first to evaluate these factors, showed that dominant affective temperamental features do not affect patient satisfaction with TKA.

This study has 3 main shortcomings. First, the study population had an extremely high dominant temperament rate. It has been shown in a study in a university environment that the prevalence of dominant temperaments was very low (2.1% for dominant depressive, 1% for cyclothymic, 0.8% for hyperthymic, 2.4% for irritable, and 2.4% for anxious temperaments).[12] In this Turkish sample, the authors also concluded that the temperament scores might decrease with age. The sample showed that 39% of participants had a dominant temperament, which seems to be a bias on patient selection with an extremely high prevalence, but this high rate can be attributed to the patient population. Finan et al[17] showed that stable negative effects are a stronger predictor of clinical chronic osteoarthritis pain than stable positive effects. In addition, the prevalence of preoperative depressive and anxiety symptoms has been shown to be high among patients with severe major joint arthrosis, and postoperatively, patients with depressive and anxiety symptoms had lower satisfaction rates than patients without these symptoms.[18] Overall, these factors suggest an explanation of the high prevalence of dominant temperaments in the present study population and may reflect the need for future studies of the prevalence of dominant temperaments in patients with chronic musculoskeletal diseases. Second, although the TEMPS-A questionnaire has high reliability among nonclinically ascertained controls, to find a patient with cyclothymic or irritable temperament is quite difficult. In the present study, the cyclothymic and irritable size of the sample was sacrificed to obtain patients who met the stringent inclusion and exclusion criteria, resulting in more homogenous study groups. The cyclothymic and irritable temperaments had a total prevalence of 1.2% in the study population and these are indicative of depression with the potential onset of depression at a younger age, a slightly higher rate of recurrence and higher rates of irritability.[19] A multicenter study with a greater number of participants would be able to overcome this problem. Last, the sample size was relatively small and the follow-up period, short for a psychosocial study. However, this study was a prospective, blinded study with highly selected, consecutive patients. The careful matching of the study group with the nondominant temperament group reduced the effect of this limitation.

There is nearly universal agreement that temperament is the stable core of personality, which is independently inherited. It represents how the person is and defines how the person reacts. Affective temperaments were first organized under the label of manic-depressive insanity, then modified by Akiskal and Mallya[20] as depressive (pessimism, low self-esteem, and self-denial), hyperthymic (overenergetic and overconfident), cyclothymic (tempestuous), irritable (restless, aggressive, and complaining), and anxious temperaments (exaggerated disposition toward worrying). Various dominant temperament features have been shown to be associated with anxiety and depression.[21] As depressive, irritable, and anxious temperaments can be more frequently related with anxiety and depression, it could be concluded that patients with these types of dominant temperaments may have lower satisfaction rates.

Together with proper implant alignment and excellent physical therapy, the patient and his or her psychosocial and medico-economic environment may influence the final outcome of the treatment. To the best of our knowledge, there have been no studies in English language literature on the relationship between a dominant temperament and patient satisfaction after total joint arthroplasty. Although patient-reported outcomes after such operations are generally satisfactory, this is not always the case, with up to 7% to 20% of patients reporting dissatisfaction.[1–3] Apart from postoperative complications, preoperative high patient expectations,[2,9,22] postoperative chronic catastrophic pain,[23–25] and preoperative anxiety and depression have been shown to affect morbidity after TKA.[18,26] However, the present study results did not determine any relationship between satisfaction and dominant temperament features.

There is little documentation existing for the effect of affective temperament on somatic disorders. To date, affective temperaments have been assessed in patients with HIV infection,[27] pediatric fractures,[28] chronic obstructive pulmonary disease,[29] restless leg syndrome,[30] psoriasis,[31] and type II diabetes[32] but not after total knee replacement that is a common orthopedic procedure. Two studies advised evaluation of depressive temperaments to better control of morbidities associated with restless leg syndrome and diabetes.[29,32] Moore et al[27] also reported that risky temperaments such as an irritable or explosive temperament increase the risk of HIV infection by engaging the individual to use more harmful substances. In children, Zheng et al[28] used the New York Longitudinal Study Temperament Scale for 3 to 7-years old and reported that of the 4 main temperament types, children with a difficult type of temperament were more prone to fractures. In contrast to the above-mentioned reports, the dimensions of temperament were not associated with psoriasis.[31]

5. Conclusion

The results of this study demonstrated that a dominant affective temperament does not influence patient outcomes after TKA. Patient satisfaction was directly related to better functional outcomes. A patient with a dominant depressive temperament might have perfect satisfaction when surgery meets all the satisfaction criteria, whereas a patient without a dominant temperament may not benefit from the operation when things do not go well. Despite the short follow-up period, this unique population can be considered to warrant a separate therapeutic study. There is a need for a dedicated long-term study also evaluating population/cultural differences of a larger and more representative sample.

Acknowledgments

We acknowledge Merve Türkegün PhD, in the Department of Biostatistics at the Mersin University for her valuable contribution in statistical analysis.

References

[1] Baker PN, van der Meulen JH, Lewsey J, et al. National Joint Registry for England and WalesThe role of pain and function in determining patient satisfaction after total knee replacement: data from the National Joint Registry for England and Wales. J Bone Joint Surg Br 2007;89: 893–900.
[2] Bourne RB, Chesworth BM, Davis AM, et al. Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? Clin Orthop Relat Res 2010;468:57–63.
[3] Sesen H, Demirkale I, Karaduman M, et al. Why two-thirds of patients accepted the second session in staged bilateral total knee arthroplasty: a prospective analysis of 111 patients. Knee Surg Sports Traumatol Arthrosc 2015;23:3585–90.
[4] Dowsey MM, Dieppe P, Lohmander S, et al. The association between radiographic severity and pre-operative function in patients undergoing primary knee replacement for osteoarthritis. Knee 2012;19:860–5.
[5] Rosenberg AG. Management of extensor mechanism rupture after TKA. J Bone Joint Surg Br 2012;94:116–9.
[6] Scott CEH, Howie CR, MacDonald D, et al. Predicting dissatisfaction following total knee replacement: a prospective study of 1217 patients. J Bone Joint Surg 2010;92:1253–8.
[7] Katz JN, Barrett J, Mahomed NN, et al. Association between hospital and surgeon procedure volume and the outcomes of total knee replacement. J Bone Joint Surg Am 2004;86:1909–16.
[8] Kempton LB, Ankerson E, Wiater JM. A complication based learning curve from 200 reverse shoulder arthroplasties. Clin Orthop Relat Res 2011;469:2496–504.
[9] Noble PC, Conditt MA, Cook KF, et al. The John Insall award: patient expectations affect satisfaction with total knee arthroplasty. Clin Orthop Relat Res 2006;452:35–43.
[10] Dohnke B, Knäuper B, Müller-Fahrnow W. Perceived self-efficacy gained from, and health effects of, a rehabilitation program after hip joint replacement. Arthritis Rheum 2005;53:585–92.
[11] Walsh MA, Brown LH, Barrantes-Vidal N, et al. The expression of affective temperaments in daily life. J Affect Disord 2013;145:179–86.
[12] Vahip S, Kesebir S, Alkan M, et al. Affective temperaments in clinically-well subjects in Turkey: initial psychometric data on the TEMPS-A. J Affect Disord 2005;85:113–25.
[13] Jamieson S. Likert scales: how to (ab)use them. Med Educ 2004;38: 1217–8.
[14] Brazier JE, Harper R, Jones NM, et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. Br Med J 1992;305:160–4.
[15] Drexler M, Dwyer T, Chakravertty R, et al. Assuring the happy total knee replacement patient. J Bone Joint Surg 2013;95(11 suppl A):120–3.
[16] Morvan Y, Tibaoui F, Bourdel MC, et al. Confirmation of the factorial structure of temperamental autoquestionnaire TEMPS-A in non-clinical young adults and relation to current state of anxiety, depression and to schizotypal traits. J Affect Disord 2011;131:37–44.
[17] Finan PH, Qaurtana PJ, Smith MT. Positive and negative affect dimensions in chronic knee osteoarthritis: effects on clinical and laboratory pain. Psychosom Med 2013;75:463–70.
[18] Duivenvoorden T, Vissers MM, Verhaar JAN, et al. Anxiety and depressive symptoms before and after total hip and knee arthroplasty: a prospective multicenter study. Osteoarthritis Cartilage 2013;21:1834–40.
[19] Akiskal HS, Hantouche EG, Allilaire JF. Bipolar II with and without cyclothymic temperament: 'dark' and 'sunny' expressions of soft bipolarity. J Affect Disord 2003;73:49–57.
[20] Akiskal HS, Mallya G. Criteria for the "soft" bipolar spectrum: treatment implications. Psychopharmacol Bull 1987;23:68–73.
[21] Lu X, Chen Z, Cui X, et al. Effects of temperament and character profiles on state and trait depression and anxiety: a prospective study of a Japanese youth population. Depress Res Treat 2012;2012:604684.
[22] Haanstra TM, van den Berg T, Ostelo RW, et al. Systematic review: do patient expectations influence treatment outcomes in total knee and total hip arthroplasty? Health Qual Life Outcomes 2012;18:152.
[23] Brander V, Gondek S, Martin E, et al. Pain and depression influence outcome 5 years after knee replacement surgery. Clin Orthop Relat Res 2007;464:21–6.
[24] Forsythe ME, Dunbar MJ, Hennigar AW, et al. Prospective relation between catastrophizing and residual pain after knee arthroplasty: two-year follow-up. Pain Res Manage 2008;13:335–41.
[25] Riddle DL, Wade JB, Jiranek WA, et al. Preoperative pain catastrophizing predicts pain outcome after knee arthroplasty. Clin Orthop Relat Res 2010;468:798–806.
[26] Browne JA, Sandberg BF, D'Apuzzo MR, et al. Depression is associated with early postoperative outcomes following total joint arthroplasty: a nationwide database study. J Arthroplasty 2014;29:481–3.
[27] Moore DJ, Atkinson JH, Akiskal H, et al. Temperament and risky behaviors: a pathway to HIV? J Affect Disord 2005;85:191–200.
[28] Zheng P, Ju L, Ma X, et al. Psychological-behavioral characteristics and fractures in children are closely related. J Pediatr Orthop B 2014; 23:560–5.
[29] Kahraman H, Orhan FO, Sucakli MH, et al. Temperament and character profiles of male COPD patients. J Thorac Dis 2013;5:406–13.
[30] Cakmak VA, Gazioglu S, Usta NC, et al. Evaluation of temperament and character features as risk factors for depressive symptoms in patients with restless legs syndrome. J Clin Neurol 2014;10:320–7.
[31] Litaiem N, Youssef S, Jabeur K, et al. Affective temperament profile in psoriasis patients in Tunisia using TEMPS-A. J Affect Disord 2013; 151:321–4.
[32] Gois C, Barbosa A, Ferro A, et al. The role of affective temperaments in metabolic control in patients with type 2 diabetes. J Affect Disord 2011;134:52–8.