## Association Between Type A and Type B Personality with Pain, Function, and Quality of Life in Knee Osteoarthritis: A Cross-Sectional Study

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INTRODUCTION: Knee osteoarthritis (OA) is the most common degenerative joint disease that is treated with knee arthroplasty in the severe stages. Indications for arthroplasty are based on the patient's reported pain and function, which are influenced by the patient's psychological state and personality types. Type A and B personality types are two contrasting categories that describe different personality traits and behavioral patterns. Type A personalities are highly driven, time-sensitive, stressed, and competitive, while type B personalities are more laid-back, tolerant of others, and less prone to stress. In this study, we aimed to illustrate the potential impact of type A and B personalities on pain, function, and quality of life in patients with knee OA, thereby providing valuable insights for surgeons when making informed decisions regarding suitable management and treatment strategies for each individual. METHODS:

In this cross-sectional study, patients who visited our outpatient orthopaedic clinic due to chronic knee pain and were diagnosed with OA were evaluated. The patients' personalities were determined based on the criteria described by Friedman and Rosenman. For each patient, OA symptoms, including pain, stiffness, functional disability, and the participants' quality of life, and also the duration of OA symptoms were evaluated. Visual Analogue Scale (VAS) for pain, Western Ontario and McMaster Universities osteoarthritis index (WOMAC), Stanford Health Assessment Questionnaire 8-Item Disability Index (HAQ 8-item DI), and Short Form Health Survey (SF-36) were assessed.

Statistical analysis was performed using SPSS statistical software version 29 (IBM, Armonk, New York). One-way ANOVA and students' t-test were used to analyze normally distributed continuous variables. In addition, we used the Kruskal–Wallis and Mann-Whitney U test for analyzing not normally distributed continuous variables. The Pearson Chi-Square test was used for categorical variables analysis, and Spearman and Pearson's correlation tests assessed associations between the variables. P values less than 0.05 were considered statistically significant. RESULTS:

After considering the exclusion criteria, 99 patients were included in this study. Type A personality was observed in 40 patients, and 59 patients had personality type B. Patients of the two groups did not have any statistically significant difference in terms of the duration of OA symptoms and the radiographic stage of OA based on joint space width (JSW). The patients' characteristics are demonstrated in Table 1.

When comparing patients with overt A personality to those with other types of personality, we found that the total WOMAC score was better in patients with severe A personality compared to in other patients ( $31.33 \pm 32.64$  Vs  $50.20 \pm 28.49$ , p-value= 0.015). Additionally, patients with overt type A personality had better scores in the subscales of pain and physical function disability of WOMAC independently compared to other patients (p-values were 0.035 and 0.016, respectively).

The patients with personality types A and B showed no significant difference regarding the total SF-36 score (p-value = 0.482). However, people with type A personality had higher scores in the general mental health (MH) domain of SF-36 (p-value = 0.04). Also, the physical function (PF) domain scores were higher in people with overt type A personality than other patients (54.18 ± 34.85 compared to 34.70 ± 30.38, p-value = 0.039).

The VAS pain scores were not significantly different between the people with type A and B personalities (p-value >0.05). Also, no significant difference was observed in people with overt type A personality compared to the others (p-value =0.085). There was no significant difference between type A and B personality groups with respect to the HAQ-DI score (p = 0.911). Also, participants with overt type A personality showed no significant difference in HAQ-DI score (p-value>0.05). The mean scores of each questionnaire in the two personality groups are demonstrated in Table 2.

DISCUSSION AND CONCLUSION: Patients with overt type A personality demonstrate better scores in the WOMAC and physical function domain of the SF-36 compared to the patients in the other groups. Additionally, people with type A personality had higher scores in the general mental health domain of SF-36 compared to the type B personality group. Based on our results, patients with type overt type A personality report less pain compared to patients with other types of personality with similar radiographic OA severity. Therefore, it is important to consider the personality types of the patients when planning the management strategies of knee osteoarthritis. These findings highlight the influence of personality traits on pain perception and the severity of symptoms in individuals with knee osteoarthritis. Consequently, it is essential to consider the personality types of knee osteoarthritis patients when planning the management strategies.

## Table 1 Patient characteristics in the type A and type B personality types

Variable		Total n =99 (100%)	Type A n =40 (40.4%)	Type B n =59 (59.6%)	P- lue	P-value between 4 groups
Gender	Men	37 (37.4)	17 (42.5)	20 (33.9)	0.385	0.122
	Women	62 (62.6)	23 (57.5)	39 (66.1)	0.385	0.122
Age (years)		$64.28 \pm 10.67$	$65.53 \pm 12.75$	$63.44 \pm 9.03$	0.375	0.635
BMI (kg/m <sup>2</sup> )		$28.40\pm3.89$	$28.82\pm3.77$	$27.97 \pm 3.99$	0.145	0.181
Alcohol Smokers		8 (8.1)	4 (10)	4 (6.8)	0.711	0.103
Tobacco S	mokers	14 (14.1)	4 (10)	10 (16.9)	0.330	0.481
Duration Symptoms	of OA (years)	$5.65\pm5.98$	$6.41\pm 6.87$	$5.14\pm5.30$	0.513	0.791
OA Sever mm	ity (JSW),	$4.67\pm2.05$	$4.70\pm1.81$	4.66 ± 2.19	0.951	0.470
Notes: BM	I body mass	index. OA: Oster	arthritis ISW Io	int Space Width		

Notes: BMI: body mass index, OA: Osteoarthritis, JSW: Joint Space Width

Table 2. Mean  $\pm$  SD of questionnaires in A and B personality groups.

Variables VAS		Type A (n=40)	Type B (n=59)	<b>P-value</b> 0.871	P-Value between 4 groups 0.208
		6.75 ± 2.75	6.83 ± 2.63		
WOMAC	Total	$43.46 \pm 31.04$	48.89 ± 29.40	0.383	0.074
	Pain	9.75 ± 6.537	$10.20 \pm 5.98$	0.758	0.121
	Stiffness	$3.70 \pm 2.76$	3.86 ± 2.71	0.748	0.210
	Physical				
	Function	30.25 ± 22.39	34.83 ± 21.79	0.252	0.080
	Disability				
SF-36	Total	96.95 ± 16.20	94.77 ± 13.47	0.482	0.446
	GH	$51.37 \pm 14.05$	$51.18 \pm 14.15$	0.969	0.986
	BP	$53.87 \pm 25.38$	51.27± 24.40	0.614	0.445
	SF	$58.12 \pm 23.43$	$55.50\pm21.05$	0.576	0.900
	MH	$57.70 \pm 14.60$	51.86 ± 13.09	0.040*	0.122
	VT	$51.50 \pm 16.61$	$53.55 \pm 15.11$	0.201	0.482
	RE	40.07 ± 42.05	$48.14 \pm 44.11$	0.755	0.982
	RP	$40.95 \pm 45.34$	$40.15 \pm 41.29$	0.969	0.841
	PF	$42.54 \pm 33.86$	$35.65 \pm 30.73$	0.375	0.204

 PF
 42.54 ± 33.86
 35.65 ± 30.73
 0.375
 0.204

 HAQ-DI
 1.44 ± 0.83
 1.42 ± 0.83
 0.911
 0.292

 VAS visual analogue scale.
 SF-36 Short Form Health Survey-36, GH general health perception, BP bodily pain, SF social functioning, MH mental health, VT visility, RE role limitations as a result of physical problems, FP physical functioning, WOMAC Western Ontario and McMaster Universities osteoarthritis index, HAQ-DI Stanford Health Assessment Questionnaire Disability Index