

## PERSONALITY TRAITS AND TREATMENT COMPLIANCE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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### SUMMARY

**Background:** Personality traits, especially types A/B and D, have been linked to negative outcomes in various somatic illnesses. In this study, we aimed to assess the prevalence of personality types and their association with certain aspects of treatment compliance in patients with type 2 diabetes mellitus (T2DM).

**Subjects and methods:** Participants in this study were 91 in- and outpatients suffering from T2DM and 73 healthy control subjects. All the participants filled out standardized self-report measures of personality types A/B (Bortner Rating Scale) and D (Type D Scale; DS-14). In addition, two aspects of treatment compliance were assessed: blood glucose assessment and visits to the primary care physician.

**Results:** We found a higher incidence of personality type B ( $\chi^2=4.086$ ,  $p=0.049$ ) and personality type D ( $\chi^2=4.215$ ,  $p=0.048$ ) in the group of T2DM patients compared to healthy controls. Patients with type D personality were less compliant in terms of the visits to the primary care physician ( $\chi^2=4.229$ ,  $p=0.040$ ), although they were more prevalent among those who were compliant regarding the frequency of blood glucose assessment ( $\chi^2=4.022$ ,  $p=0.045$ ).

**Conclusion:** The current study shows that type B and type D personality are frequent among T2DM patients. Moreover, type D personality could lead to certain aspects of suboptimal health behaviors and, therefore, interfere with disease management in diabetic populations.

**Key words:** personality - type D personality – diabetes - T2DM – treatment compliance

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### INTRODUCTION

In recent years, a large amount of studies have investigated the effects of certain personality types on clinical and psychological outcomes in a variety of patient populations (Cosci et al. 2012). Personality types A/B and D were firstly introduced in the coronary disease research but showed to have significance in other patients' populations as well. Type A individuals are typically ambitious, rigidly organized, highly status conscious, impatient and high-achieving. They are also prone to multi-tasking, pushing themselves with deadlines, and they hate both delays and ambivalence. Conversely, Type B personality includes people who live at a lower stress level and typically work steadily, enjoying achievements but not becoming stressed when they are not achieved (Day & Jreige 2002).

Type D is defined by the combination of two personality traits: negative affectivity and social inhibition (Danellot 2005). People who score high on negative affectivity have the tendency to experience negative emotions, while people who score high on social inhibition have the tendency not to express these emotions, because of fear of rejection or disapproval by others. Persons with high levels on both personality traits are classified as having a type D personality. Type D personality construct was originally developed in order to study the role of personality traits in coronary heart disease outcome (Aquarius et al. 2005) but further

research linked it to lower physical and mental health status, more somatic complaints (Chapman et al. 2007), higher rates of medically documented comorbidity (Moles et al. 2012), and reports of feeling more bothered by their illness (Chapman et al. 2007, Mols & Denollet 2010). They are also reluctant to consult medical staff (Pelle et al. 2010) which may be directly linked to negative clinical outcomes (Williams et al. 2008). Type D personality was related to certain biological mechanisms such as immune activation (Denollet et al. 2009) and to disruption of HPA axis function (Whitehead et al. 2007).

In diabetes mellitus the main therapeutic goal is good glycaemic and metabolic control which is highly influenced by various psychological factors and stress (Zheng et al. 2015), including individuals' personality traits (Skinner et al. 2014, Nefs et al. 2015). For example, type D personality was associated with unhealthy behaviors among diabetic patients in one study (Nefs et al. 2015), whereas other research suggested non-significant role of type A personality after controlling for covariates (Cukic & Weiss 2014). The poor metabolic control is directly related to the development of microvascular complications such as retinopathy, nephropathy and neuropathy (Wikbald et al. 1996).

Therefore, the aim of the present study was to assess the prevalence of personality A/B and D type in patients with type 2 diabetes mellitus and to examine the association between those personality types and treatment compliance in this chronic disease.

## SUBJECTS AND METHODS

Participants in this study were 91 individuals suffering from type 2 diabetes mellitus (T2DM) who were either in- or outpatients at the Department of Endocrinology, Diabetes and Metabolic Disorders at the University Clinical Hospital Mostar and in the Unit for Family Medicine at the Health Center in Mostar, Bosnia and Herzegovina. The diagnosis of type 2 DM independent of insulin was established according to the ICD-10 diagnostic criteria (E11.0). All of the patients had fallen ill during adulthood. The control group consisted of 73 healthy subjects who had no history of psychosomatic or psychiatric illnesses. They were recruited from the hospital staff of the University Hospital Center Mostar. Participants' written informed consent was obtained and the study was officially approved by the ethical committees of the institutions where the study was carried out. Subjects in both groups filled out standardized self-assessment instruments, alone or with the help of the medical staff.

In the patient group, 51 (56%) participants were female. The mean age of this sample was 62.41 years (SD=12.48 years). Regarding their educational status, 43 (47.3%) participants had completed elementary school, 34 (37.4%) had completed high-school and 14 (15.4%) held a college degree. Finally, the sample consisted of 69 (75.8%) married participants, 7 (7.7%) single, 1 (1.1%) divorced, 12 (13.2%) widowed, and 2 (2.2%) non-determined participants.

In the control group, 42 (57.5%) participants were female. The mean age of this sample was 40.88 years (SD=12.11 years). Regarding their educational status, 3 (4.1%) participants had completed elementary school, 35 (47.9%) had completed high-school and 35 (47.9%) held a college degree. Finally, the sample consisted of 51 (69.9%) married participants, 14 (19.2%) single, 4 (5.6%) divorced, 1 (1.4%) widowed, and 4 (4.1%) non-determined participants.

Socio-demographic questionnaire was designed for the purposes of this study to assess of the following variables: age, gender, education, and marital status.

Bortner Rating Scale (Bortner 1969) is a self-report instrument used for measurement of type A/B personality. It consists of 14 pairs of items that are scored on a 11-point scale. Total score of 84 and more indicates type A personality, while total score of less than 84 indicates type B personality.

Type D Scale (DS-14; Denollet 2005) comprises 14 items, contributing to two 7-items subscales: negative affectivity (NA) and social inhibition (SI). Type D personality is established when the scores on both subscales are 10 or higher. The DS-14 has shown high internal consistency and good test-retest reliability in previous studies (Denollet 2005).

Treatment compliance measure was based on two behaviors reported by the patients: frequency of blood glucose assessment and frequency of encounters with the primary care physician. The patients were divided into compliant and non-compliant subgroups for each of these two variables.

## Statistical Analysis

All statistical analyses were performed using the SPSS version 19 (SPSS, Chicago, IL). Descriptive analysis included percentages, means and standard deviations. The Chi-square test was used to examine the potential differences in socio-demographic variables and personality types between the T2DM patients and control subjects, as well as between compliant and non-compliant patients. We defined the level of statistical significance as P less than 0.05.

## RESULTS

Regarding socio-demographic differences between the two examined groups of subjects, there was no significant difference in terms of gender distribution ( $\chi^2=0.037$ ,  $p=0.974$ ). The T2DM patients were older than the control subjects ( $\chi^2=80.612$ ,  $p<0.001$ ), such that the majority of patients (85.7%) were in the 50+ age group, whereas most control subjects (72.6%) were less than 50 years old. Finally, patients were at the lower educational level than the control subjects ( $\chi^2=43.324$ ,  $p<0.001$ ).

The differences found in the personality type A/B ( $\chi^2=4.086$ ,  $p=0.049$ ) and the personality type D/non-D ( $\chi^2=4.215$ ,  $p=0.048$ ) among the subjects in the two groups were statistically relevant, such that there was a higher incidence of personality type B and personality type D in the group of T2DM patients (Table 1).

Patients with type D personality were more prevalent among those who were compliant regarding the frequency of blood glucose assessment ( $\chi^2=4.022$ ,  $p=0.045$ ). Conversely, patients with type D personality were less compliant in terms of the visits to the primary care physician ( $\chi^2=4.229$ ,  $p=0.040$ ) (Table 2).

**Table 1.** Distribution of personality types A/B and D/non-D among the study participants

Personality type N=164	Control group n=73	Patients with T2DM n=91
Type A 135 (82.3%)	65 (89.0%)	70 (76.9%)
Type B 29 (17.7%)	8 (11.0%)	21 (23.1%)
Type D 73 (44.5%)	26 (35.6%)	47 (51.6%)
Type non-D 91 (55.5%)	47 (64.4%)	44 (48.4%)

T2DM - type 2 diabetes mellitus

**Table 2.** Type D personality and treatment compliance among T2DM patients

Patients with T2DM N=91	Frequency of blood glucose assessment		Frequency of visits to the primary care physician	
	Compliant 61 (67.0%)	Non-compliant 30 (33.0%)	Compliant 26 (28.6%)	Non-compliant 65 (71.4%)
Personality type				
Type D 47 (51.6%)	36 (59.0%)	11 (36.7%)	9 (34.6%)	38 (58.5%)
Type non-D 44 (48.4%)	25 (41.0%)	19 (63.3%)	17 (65.4%)	27 (41.53%)

T2DM - type 2 diabetes mellitus

## DISCUSSION

This is the first study, as far as we know, that simultaneously assessed the associations of personality types A/B and D in a population of diabetic patients, and revealed their association with treatment compliance.

Personality type B was more prevalent in patients with diabetes mellitus than in control group. Higher frequency of this personality type points that such model of behaviour without rush, time limits and competitiveness can be a result of a long term chronic illness. In addition, it can reflect low insight in personal emotional states that can be recognised on somato-vegetative level and perhaps lead to psychosomatic disease (Cosci 2012).

In this study, 52% of diabetic patients were classified as having a type D personality. This percentage is higher than the prevalence of type D personality in the control group as well in other studies conducted on general population samples (Denollet 2005, Pedersen & Denollet 2004, Aquarius et al. 2010). In the literature, type D showed to have distinctive characteristic linked to vulnerability factor that affect people with various medical conditions. It is characterized by high neuroticism, low extraversion and low conscientiousness from the Big Five personality model, but these traditional traits share less than 50% variance with Type D personality (Denollet 2005). Correlational studies have shown that type D personality is different from behavior patterns type A and B (Danellot 2005), and it also distinguishes itself from depression (Mols & Denollet 2010, Vukovic et al. 2014). It seems that type D personality is not directly linked to biomedical risk factors (Nefs et al. 2012), but rather promotes suboptimal health behaviors among diabetic patients (Nefs et al. 2015).

Type D patients showed to be more compliant in self-monitoring of glycemic state but less compliant than non-D personality in regular check-ups with the family physician. Typical characteristic of type D are proneness to worry and uncertainty which can increase the frequency of self-monitoring, but at the same time promote avoidance of regular check ups with family physician because of characteristics such as inhibition, self-absorption and avoidant coping (Pedersen &

Denollet 2003). One recent study also showed a significant association between type D personality and unhealthy behaviors (i.e., more barriers surrounding medication use) among diabetic patients (Nefs et al. 2015). Moreover, it was predictive of general emotional distress, including diabetes-specific social anxiety, loneliness, depression, and anxiety.

Limitations of our study are small sample size and cross-sectional data which prevents us from making causal attributions. Also, our control group differed in term of age and education level compared to patient group, and that could have affected our findings. For example, one might hypothesize that the higher prevalence of individuals with type B personality among the patient group is partly due to their older age, not just chronic illness. Despite these limitations, the present study provides a relevant contribution to the field since the data on the association of type A/B and D personality with diabetes mellitus are scarce in the literature.

## CONCLUSION

The current study shows that type B and type D personality are more prevalent among patients with diabetes mellitus than in the healthy control group. Moreover, type D personality seems to promote self-monitoring of glycemic state, but is associated with reduced compliance regarding regular check-ups with the family physician. Despite some methodological limitations, our research suggests type D personality could lead to suboptimal health behaviors and, therefore, interfere with disease management in diabetes mellitus populations.

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**Conflict of interest :** None to declare.

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