

Original Research

The Dominant Personality Trait in Type 2 Diabetes Mellitus Patients at Dr. Soetomo General Academic Hospital Surabaya

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Abstracts

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Introduction: Diabetes mellitus (DM) is a chronic disease characterized by elevated blood sugar levels above the normal range. The global prevalence of DM increased, with over 90% of cases being Type 2 Diabetes Mellitus (T2DM). People attempted various physical therapies, including adopting a healthy lifestyle through dietary adjustments, physical activity, and pharmacological interventions. However, we have not extensively explored non-physical therapies related to personality traits, and the incidence of DM remains high. The Big Five Personality Theory encompasses openness, conscientiousness, extraversion, agreeableness, and neuroticism. Each personality trait is believed to have specific tendencies toward diseases, emphasizing the importance of identifying the dominant personality traits in T2DM patients. This study aims to identify the dominant personality type in T2DM patients based on the Big Five Personality Theory at Dr. Soetomo General Hospital Surabaya. **Methods:** We employed a cross-sectional approach for data collection, using Big Five personality questionnaires as the primary data sources. **Results:** Among the 68 T2DM patients who participated in this study at Dr. Soetomo General Hospital Surabaya, from October 2022 to May 2023, the mean age of patients was 51-60 years, with a majority of female participants (63.2%) and male participants (37.8%). The questionnaire results indicated that the dominant personality trait was agreeableness (85.3%). **Conclusion:** The dominant personality type in T2DM patients, according to the Big Five Personality Theory at Dr. Soetomo General Academic Hospital Surabaya, was agreeableness (85.3%).

Keywords: Agreeableness, Big five personality, Conscientiousness, Personality type, T2DM

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INTRODUCTION

Diabetes mellitus (DM) is a chronic disease characterized by elevated blood sugar levels exceeding normal limits, which occurs when the pancreas fails to produce sufficient insulin or when the body cannot effectively utilize the produced insulin [1]. According to data from the International Diabetes Federation (IDF), in 2021, 1 in 10 adults worldwide is living with DM, with over 90% of these cases being type 2 diabetes (T2DM). The prevalence of DM is projected to continue rising each year [2].

The escalating prevalence of DM has prompted medical scientists to develop various efforts to reduce the incidence of T2DM. Therapeutic approaches broadly consist of physical and non-physical therapies. Physical therapy encompasses dietary interventions, physical activity, antidiabetic medications, pancreatic transplantation, and stem cell therapies [3]. Personality changes are associated with non-physical therapy. Humans are living beings composed of both physical and non-physical aspects. The roles of the physical and non-physical aspects are interlinked in human life, which is why physical and non-physical therapies should be undertaken in conjunction to address the issue of T2DM. While physical therapy has seen significant developments, non-physical therapy has yet to receive comparable attention. Non-physical therapy involves managing an individual's personality, as an individual's personality has the potential to promote or hinder their health [4].

McCrae and Costa (1992) proposed The Big

Five Personality model, which identifies personality traits as OCEAN (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) [5]. Each disease corresponds to specific personality traits. To manage individual personalities as a non-physical therapy model, it is necessary to identify the dominant personality traits in T2DM patients at Dr. Soetomo Hospital in Surabaya, based on The Big Five Personality Theory

METHODS

This study employed a quantitative descriptive research design with a cross-sectional approach. From October 2022 to May 2023, this study included patients diagnosed with T2DM at the Internal Medicine and Endocrinology of Dr. Soetomo General Hospital Surabaya. We used the total sampling method to carry out the sampling, focusing on patients aged 30-60 years who could speak and read in Indonesian. We applied exclusion criteria to those unwilling to participate and those with communication disorders. The Big Five Personality questionnaire facilitated data collection in this study. The Research Ethics Committee of Dr. Soetomo General Academic Hospital Surabaya approved this study under the ethical clearance number 1057/LOE/301.4.2/IX/2022. The research informs patients about its background, purpose, benefits, risks, and procedures prior to data collection. Additionally, we inform patients about their right to refuse or withdraw from the research, confidentiality guarantees, and who to contact for any inquiries. We obtained written informed consent from each participant if they understood and were willing to participate.

RESULTS

Table 1. Characteristics of patients diagnosed with T2DM at the Internal Medicine and Endocrinology of Dr. Soetomo General Hospital Surabaya

Characteristics	Personality type according to the Big Five											
	Openness		Conscientiousness		Extraversion		Agreeableness		Neuroticism		Mixed	
	n	%	n	%	n	%	n	%	n	%	n	%
Total patients with T2DM	3	4.4	1	1.5	3	4.4	58	85.3	0	0	3	4.4
Sex												
Man (n=25)	1	1.5	0	0	1	1.5	20	29.4	0	0	3	4.4
Women (n=43)	2	2.9	1	1.5	2	2.9	38	55.9	0	0	0	0
Age												
30-40 years	0	0	0	0	0	0	7	10.3	0	0	0	0
41-50 years	1	1.5	1	1.5	1	1.5	15	22	0	0	1	1.5
51-60 years	2	2.9	0	0	2	2.9	36	53	0	0	2	2.9

The data yielded a sample of 68 patients diagnosed with type 2 diabetes mellitus (T2DM). Among all the collected patient data, the dominant personality type in T2DM patients based on The Big Five Personality Theory at Dr. Soetomo General Hospital Surabaya was agreeableness, with a total of 58 patients (85.3%). Among these, 38 were female patients (55.9%), and 20 were male patients (29.4%), with the majority falling in the 51-60 year age group (53%).

DISCUSSION

In this study, the results showed that T2DM patients are predominantly female, and the majority of patients fall within the age group of 51–60 years. According to the 2018 Basic Health Research, the prevalence of T2DM is higher in women than in men [6]. The prevalence of T2DM is higher in women than in men [7], primarily due to women having a higher percentage of body fat, which contributes to central obesity and impairs glucose tolerance [8]. Diabetes is more challenging to manage in women because their insulin sensitivity tends to be lower than in men, and there are changes in insulin secretion by pancreatic beta cells and decreased organ sensitivity after menopause [7].

In the present study, Agreeableness is the dominant personality in T2DM patients. High agreeableness scores indicate a person's propensity to preserve social bonds and be agreeable to others, especially those in positions of power. They are also easy to trust, honest, amiable, compassionate, modest, and gentle [9–11]. Research shows that individuals with high agreeableness also typically have poor dietary habits. Their tendency to accept social invitations and events has an impact on their poor dietary habits [12]. A poor diet is one of the risk factors for T2DM [13–15].

Traditional Chinese medicine describes five organs related to personality [16, 17]. Conscientiousness represents the pancreas, while agreeableness represents the kidney. Additionally, openness represents the liver,

extraversion represents the heart, and neuroticism represents the lungs. The personality type of T2DM patients by this theory is conscientiousness, or the personality of the pancreas [4]. Patients exhibit an agreeableness personality type, as they may encounter complications with the kidneys.

Damage to pancreatic beta cells can lead to kidney damage [17]. The kidney plays a crucial role in insulin clearance from the circulation, making it a significant target for microvascular damage in diabetes [18]. According to the CDC (Centers for Disease Control and Prevention), approximately 1 in 3 adults with diabetes suffer from chronic kidney disease, and around 170 diabetes patients begin treatment for kidney failure every 24 hours [19]. The incidence of end-stage kidney disease due to diabetes increases in the elderly population [20, 21]. Additionally, the duration of diabetes is a primary determinant of the risk of end-stage kidney disease [20]. Patients who have had diabetes for ≥ 15 years are at a 1.75-fold increased risk of chronic kidney disease [22].

Conscientiousness refers to someone hard-working, diligent, efficient, ambitious, goal-oriented, and achievement-oriented [23]. An imbalanced conscientiousness personality can lead to excessive worrying, which can increase stress and contribute to the development of T2DM [4, 24]. Stress activates the HPA (hypothalamus-pituitary-Adrenal) axis. HPA axis activation results in the secretion of CRH (corticotropin-releasing hormone) from the hypothalamus, stimulating the anterior pituitary gland to release ACTH (adrenocorticotropic hormone). ACTH causes the release of cortisol from the adrenal glands, which is responsible for elevated blood glucose. Prolonged elevation of cortisol levels and disrupted glucose homeostasis lead to T2DM [25, 26]. Increased worry and stress in T2DM patients are significantly correlated with higher HbA1c levels [27]. A person who experiences prolonged stress develops depression [28]. An individual's level of depression increases with their

level of stress [29]. T2DM is frequently accompanied by depression [30, 31].

The psychological well-being of T2DM patients is considered a crucial element in their treatment and condition management. Neglecting this aspect often results in poor adherence to medical therapy [32]. Psychological well-being is essential for T2DM patients, as it can enhance the immune system, improve resistance to various illnesses, and promote holistic well-being [33, 34]. In addition, social support is essential for people with both physical and non-physical illnesses as an effective strategy. Patients require social support in order to be reinforced in sticking to their medication regimen [35].

Each personality type has both positive and negative traits [36, 37]. Personality changes have an impact on the relationship between personality and health. If someone possesses negative personality traits, their health risk is likely to increase. However, if these traits shift toward the positive, the risk can be reduced [38]. This provides a preventive avenue for managing T2DM. The present study is expected to assist doctors in providing comprehensive therapy. A doctor can provide comprehensive therapy if they establish a strong rapport with the patient. Treatment compliance rates can be raised by a positive doctor-patient relationship [39]. Doctors can provide education regarding appropriate dietary patterns and give the support needed by patients. Additionally, doctors can aid patients in transforming negative behaviour into positive based on the patient's dominant personality.

This study has limitations, particularly in the selection of research subjects. The subjects not only suffered from T2DM but also had other comorbid conditions, such as kidney failure, heart failure, hypertension, nerve problems, vision issues, and various other diseases that are complications of diabetes. However, data on the comorbid conditions of the patient's were not available at the beginning of the study. Data related to education, occupation, and the duration of

diabetes in patients were also not obtained in this research. The study's limitations may arise from the limited data, as personality is significantly impacted by the patient's socio-economic status and health status. Previous studies more often discussed the relationship between personality type and diabetes. However, research specifically looking for the dominant personality type in T2DM patients is still rare. Further research related to personality in T2DM patients should be conducted in more detail. More consideration should be given to variables such as the patients education, occupation, length of time with T2DM, and coexisting medical conditions.

CONCLUSION

The dominant personality type in T2DM patients is based on The Big Five Personality theory at Dr. Soetomo General Academic Hospital Surabaya was agreeableness (85.3%).

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CONFLICT OF INTEREST

There are no conflicts of interest in this research.

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