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Comparison of Types C and D Personality in Patients with Diabetes and Hypertension with Normal People

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ABSTRACT

Objective: The current study aimed to explore the impact of personality types on individuals with diabetes and hypertension, as well as those without these conditions.

Methods: A causal-historical research approach was employed to compare 50 patients with diabetes and high blood pressure to 50 individuals without these conditions. Participants were recruited from various clinics and private offices in Zarin Shahr. The assessment tools utilized included personality type questionnaires C and D. Multivariate analysis of variance was conducted to evaluate the research hypotheses.

Results: The outcomes of the current study indicate a notable distinction in C personality type scores (T=4.45, P<0.001) between individuals with type 1 diabetes and those without diabetes (T=9.52, P<0.001), as well as between individuals with type 2 diabetes and non-diabetic individuals (T=5.45, P<0.0001). Additionally, a significant difference is noted between individuals with type 1 diabetes and non-diabetic individuals in personality type D scores (T=4.96, P < 0.001), while no significant difference is found between individuals with type 2 diabetes and non-diabetic individuals in personality type D scores (T = 1.56, P < 0.05). Similarly, there is no significant difference between individuals with hypertension and non-hypertensive individuals in D personality type scores (T = 1.64, P < 0.05).

Conclusions: Overall, the results provide evidence supporting the association between personality types and diabetes as well as high blood pressure.

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Introduction

The interplay between the mind and body has been a topic of discussion throughout the history of mankind. Generally, it is widely accepted that psychological factors contribute to the development of various illnesses. Presently, the correlation between physical ailments, mental conditions, and personality traits is well-known, with extensive research indicating a link between certain physical conditions and personality types. Despite thorough investigations on the connection between personality traits and diseases like heart conditions, there are other illnesses that have not received adequate attention despite their prevalence, such as diabetes and hypertension.

Diabetes stands as the most prevalent endocrine disorder globally and is accountable for four million deaths annually (Shaw et al., 2010). It poses a significant global health issue, putting a large portion of the population at risk of developing diabetes and its associated complications (Muchtar & Dingin, 2018). Diabetes serves as a major precursor to numerous other diseases, resulting in considerable personal and financial burdens (Emini-Sadiku et al., 2022), making prevention the most effective and economical approach to reducing overall costs (Esteghamati et al., 2017). The disease has two primary forms: type 1, characterized by idiopathic or autoimmune insulin deficiency, comprising approximately 10% of cases; and type 2, linked to insulin resistance and deficiency, accounting for 90% of cases (Bansal et al., 2017).

Within the realm of psychiatry, diabetes is categorized as a psychosomatic disorder. Studies have indicated that personality traits are significant predictors of diabetes occurrence, self-care behaviors, and management among individuals with the condition (Sobhi et al., 2017). Individuals with diabetes commonly experience high blood pressure throughout their lifetime, with over 50% of type 2 diabetes patients affected. The prevalence of high blood pressure is initially lower among individuals with type 1 diabetes, especially in younger individuals, but tends to increase with age (Lurbe et al., 2002).

High blood pressure is considered to be a significant and prevalent factor that poses a threat to human health, often identified as a leading cause of premature mortality among millions worldwide (Perry et al., 2009). The term high blood pressure denotes systolic blood pressure exceeding 140 mm Hg or diastolic blood pressure surpassing 90 mm Hg (Röder et al., 2014). Various genetic, environmental, psychological, and social factors are implicated in the development of high blood pressure, which is regarded as a severe psychological and physiological

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ailment (Larkin, 2008; Steffen et al., 2006; Yan et al., 2003). According to Feldman-Billard et al. (2010), high blood pressure is commonly viewed as a prevalent psychosomatic disorder. Reports indicate that the prevalence of hypertension ranges from 10% to 60% in different countries globally, affecting approximately 25% of adults (Nicolet et al., 2008). The worldwide prevalence of this condition is estimated to impact around one billion individuals (Soomro et al., 2021), with the World Health Organization noting that 12.8% of annual deaths are attributed to high blood pressure (Mendis, 2013).

Personality plays a crucial role in the correlation between illness and well-being, indicating that physical ailments can be influenced by individual personality traits (Roshan & Modaresi, 2002). Generally, there is a consensus that specific personality types are more susceptible to certain factors, leading their bodies to react to stress or conflict by manifesting physical disorders (Ahamadi Tahoor et al., 2010). Personality type encompasses a set of unique personal attributes used to assess and differentiate individuals from one another (Hashemi & Paymannia, 2014). Various personality constructs have been identified as predisposed to mental-physical and psycho-physical diseases ((Ebrahimi et al., 2010), such as type C personality, associated with susceptibility to cancer, and type D personality, linked to cardiovascular diseases.

The term Type C was originally coined in 1980 by Temoshok (1987), who examined this behavior as a characteristic of individuals with cancer. As per scholarly literature, individuals with Type C exhibit distinctive traits such as self-restraint, suppression of emotions, defensiveness, lack of self-expression, passivity, feelings of hopelessness, submission to avoid conflicts, and are generally seen as amicable and helpful individuals who tend to avoid arguments. This cancer-prone pattern is characterized by the suppression of emotions, particularly anger, inability to overcome psychological stressors, excessive kindness, cooperative demeanor, extreme patience, and emotional self-control. These individuals are sociable, composed, shy, and struggle to cope with interpersonal stress, often experiencing emotional sensitivity to separation. They encounter difficulties in articulating their feelings, leading to feelings of helplessness, hopelessness, and depression when faced with challenges. Type C individuals tend to avoid expressing their needs and emotions, resorting to suppression mechanisms instead, while projecting a facade of normalcy and strength in the face of life's pressures. They employ denial mechanisms to ignore external threats, distorting reality and dismissing sensory information to maintain a sense of security.

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Individuals with Type C often prioritize others over themselves, exhibiting traits of isolation, submissiveness, and a reluctance to engage in conflicts. Their behavioral inhibition and fight-flight responses are indicative of their aversion to risk-taking and inflexibility, as they tend to avoid or flee from distressing stimuli rather than confront them.

Type C individuals, as a result of utilizing defense mechanisms like denial, repression, and self-sacrifice (undeveloped defense mechanisms) to cope with psychological stress, experience impairment and disruption of their immune system. This impairment ultimately leads to the development of cancer and other psycho-physical disorders (Ebrahimi et al., 2010). The key characteristic that distinguishes individuals of this personality type from those of type D is their reluctance to respond to irritating stimuli (be it conditional or non-conditional). Unlike type D individuals, those of type C lack the willingness to engage with such stimuli; moreover, if forced to react, they may resort to aggression in their surroundings instead of facing the situation directly. They tend to evade and escape from such circumstances (Davoudi et al., 2009).

Recently, a personality model known as type D or distressed type has been introduced, characterized by the interplay of two fundamental traits - negative affect and social inhibition. Studies have demonstrated that individuals with a type D personality are generally at a higher risk for negative health outcomes, reduced health-related quality of life, and various types of distress, encompassing social isolation and impairment in daily social interactions (Mols & Denollet, 2010), anxiety, depression (Gogheri et al., 2023), heightened burnout (Polman et al., 2010), and post-traumatic stress (Grassi et al., 2021; Ogińska-Bulik & Michalska, 2019). Individuals with a type D personality exhibit less inclination towards health-related behaviors, leading to decreased levels of satisfaction and quality of life compared to those without this personality type, as they fail to meet the necessary standards for overall well-being (Moghari & Vatankhah, 2022). It can be posited that individuals with a type D personality are less likely to engage in health-promoting behaviors (Smith, 2011). The stress induced by a type D personality impacts health through alterations in behavior and physiology (Hashemi & Paymannia, 2014). Notably, type D personality serves as a variable influencing quality of life (Stevenson & Williams, 2014) and is associated with numerous diseases due to lifestyle choices. Denollet (2000) suggests that individuals with a type D personality are predisposed to cardiac and non-cardiac events such as heart attacks and depressive moods. Type D personality represents a general inclination towards psychological

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distress (Denollet, 2005) and significantly predicts both physical and psychological outcomes ((Mols & Denollet, 2010).

As per findings in the academic literature, individuals exhibiting the D personality type are anticipated to disclose diminished mental well-being (Mols & Denollet, 2010). The D personality type is delineated by two key elements: an escalating inclination towards encountering negative emotions (negative excitability) and the societal inhibition of these emotions. Negative emotions pertain to an individual's proclivity for undergoing negative feelings, encompassing despondency, unease, ire, and sentiments of animosity, across diverse moments and circumstances (Denollet, 2005). Individuals scoring high on negative excitability are not merely perturbed or agitated; Rather, they harbor a pessimistic self-perception, report heightened physical symptoms, encounter disruptions in daily social activities, and perceive the world with indications of unrest ((Denollet, 2000). Conversely, social inhibition alludes to an individual's propensity to refrain from expressing negative emotions in social exchanges. Individuals garnering a substantial rating in social inhibition habitually experience self-absorption, tension, discomfort, and insecurity during interpersonal engagements (Polman et al., 2010) and are inclined towards exerting more restraint. This is done to evade adverse reactions from others stemming from the extent of self-disclosure (not articulating and elucidating one's viewpoints and attributes) (Ogińska-Bulik & Michalska, 2019). From a clinical perspective, individuals with a type D personality are predisposed to apprehension, tension, melancholy, and a bleak and pessimistic perspective on life. They are easily perturbed and generally encounter fewer positive emotions. These individuals internalize their emotions and eschew expressing negative feelings due to the dread of rejection or being deemed insignificant. Type D individuals forge fewer interpersonal connections and feel uneasy in unfamiliar company. They have a tendency to maintain a distance from others and may struggle to exhibit assertive conduct. The type D personality may instigate stress by heightening negative emotions, and stress concurrently amplifies cortisol levels (Pedersen & Denollet, 2006). When an individual is emotionally stimulated (experiences a negative emotion), the sympathetic nervous system responds by intensifying its activity, and emotional expression serves as a pivotal release for this stimulation. Failing to articulate excitement leads to the body persisting in a state of heightened arousal. This condition is detrimental as the excessive activation of the sympathetic nervous system undermines the efficacy of the immune system. Pedersen and Denollet (2006)

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contended that the D personality type, by diminishing positive emotions, fostering social inhibition, and lacking emotional backing from companions and acquaintances during stressful periods, contributes to a decline in life contentment, quality of life, and an upsurge in psychological maladies such as depression. Irritability, anxiety, and diminished performance manifest in individuals across various endeavors.

In general, individuals exhibiting high levels of negative emotions are prone to heightened stress levels and dissatisfaction when engaging with their surroundings, perceive the world through a negative lens, and possess a fragile self-concept, resulting in discontentment with themselves and their circumstances. Those harboring elevated negative emotions often endure escalated stress throughout the day and demonstrate increased susceptibility to stressors; therefore, they exhibit stronger stress responses to encountered taxing situations, as noted by Ilbeigy Ghale Nei et al. (2014).

In contemporary times, Type D personality is recognized as an independent risk element contributing to the onset of psychological disturbances and unfavorable prognoses among patients, as highlighted by Hashemi and Paymannia (2014).

Both C and D personality types are closely linked to negative constructs like anxiety and depression, as suggested by Davoudi et al. (2009), and individuals embodying these personality types face heightened susceptibility to physical ailments, per Moradi et al. (2020). Scholars have identified these personality types as potential pathological factors impacting health and longevity, necessitating psychological interventions.

Psychological factors, such as personality and personality type, play a significant role in the development of hypertension (Larkin, 2008). Studies indicate that individuals with type D personality traits are less inclined to engage in self-care practices, particularly those related to physical exercise, and type D personality is linked to hypertension (Mols & Denollet, 2010).

Type D personality, characterized by elevated levels of negative affectivity (NA) and social inhibition (SI), has been correlated with a range of unfavorable health outcomes in various medical conditions. Studies have shown that individuals exhibiting type D personality traits face an elevated risk of developing cardiovascular diseases (CVD) as a result of persistent distress, which is reflected in specific amplitude-time ECG patterns including heightened ventricular excitability and excessive sympathetic reactivity. In individuals diagnosed with type 2 diabetes mellitus

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(T2DM), the presence of type D personality does not hinder adherence to medication, suggesting that these patients are capable of effectively adhering to treatment plans despite their psychological tendencies. Moreover, type D personality is more prevalent among patients dealing with skin conditions such as acne, psoriasis, and atopic dermatitis, and is linked to decreased quality of life and increased incidences of psychological comorbidities, highlighting the importance of psychological evaluation in dermatological settings. Based on this, the aim of the current study was to investigate the relationship between personality types C and D by comparing their characteristics among individuals with diabetes, high blood pressure, and those without these conditions. The primary objective was to ascertain whether notable distinctions exist in the attributes of personality types C and D among diabetes and high blood pressure patients and individuals without these conditions.

Material and Methods

This particular study is characterized by being post-event and contextual in nature, with a sampling methodology that can be described as simple. The research focused on the population of individuals residing in Zarin Shahr in 2020, specifically those individuals who were diagnosed with both diabetes and high blood pressure. To conduct the research, various tools were utilized, including a demographic questionnaire developed by the researcher, a questionnaire to assess Type C personality traits, and another questionnaire to evaluate Type D personality traits. The demographic questionnaire aimed to gather information regarding demographic details such as age, gender, marital status, and level of education among the participants.

The Type C scale, also known as the TCPI questionnaire, was originally developed by Hosaka et al. (1999). This scale consists of five main subscales, each comprising 5-7 questions that are rated on a four-point Likert scale ranging from 0 to 3. The subscales of the Type C scale include social (focused on conflict avoidance), emotions (related to emotion suppression), service (highlighting excessiveness and self-sacrifice tendencies), expressiveness (indicating a lack of expressiveness), and power (reflecting feelings of despair and helplessness). The internal consistency of the Type C scale was assessed in the current study using Cronbach's alpha coefficient, resulting in values of 0.64 for the overall scale, 0.78 for emotions, 0.66 for service, 0.84 for expressiveness, and 0.67 for power.

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Furthermore, the validity of the Type C questionnaire was evaluated in a separate study, with Cronbach's alpha coefficient yielding a value of 0.64 (Hosaka et al., 1999).

On the other hand, the D personality type questionnaire, consisting of 14 items, was employed to measure the D behavior pattern, focusing on negative affect and social inhibition. With 7 items dedicated to each characteristic, the scoring system was based on a Likert scale ranging from 0 (false) to 4 (true), as proposed by Denollet (2005). Typically, a cutoff score of 10 or higher in both dimensions is considered indicative of a Type D personality. The psychometric properties of the Type D personality scale were thoroughly examined, revealing internal consistencies of 0.88 for negative affectivity and 0.86 for social inhibition. Additionally, the three-month test-retest reliability showed values of 0.72 for negative affectivity and 0.82 for social inhibition (Denollet, 2005). Denollet (2005) also confirmed the convergent and diagnostic validity, as well as the factorial structure of the Type D personality scale. The sampling process involved selecting 50 individuals from each specified group (type 1 diabetes, type 2 diabetes, high blood pressure, and without any of these conditions) based on gender, resulting in a total sample size of 300 patients and 100 individuals without the mentioned conditions.

For each participant, scores from 400 questionnaires were analyzed to determine their personality types and respective subscales. Descriptive statistics, such as means and standard deviation were calculated, along with inferential statistics including Cronbach's alpha, Kolmogorov-Smirnov test, and the independent t-test.

Results

Table 1 shows the mean and standard deviation of scores of personality types in groups.

Table 1. Mean and standard deviation of scores of personality types in groups

Variable	Group	N	Mean	SD
Type C personality	Type 1 diabetes	100	50.49	6.12
	Type 2 diabetes	100	54.69	6.19
	high blood pressure	100	52.11	7.95
	Normal people	100	46.64	6.10
Type D personality	Type 1 diabetes	100	31.17	8.15
	Type 2 diabetes	100	27.61	7.08
	High blood pressure	100	28	9.65
	Normal people	100	26.12	6.09

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Table 2 shows the results of T-test related to personality types in groups.

Table 2. The results of the T test related to the comparison of personality types in groups

Variable	Levene's test	DF	T value	P
Type C personality in people with type 1 diabetes and non-diabetic people	0.24	198	4.45	0.001
Type C personality in people with type 2 diabetes and non-diabetic people	0.052	198	9.52	0.001
Type C personality in people with high blood pressure and non-diseased people	0.72	198	5.45	0.001
Type D personality in people with type 1 diabetes and non-diabetic people	0.107	198	4.96	0.001
Type D personality in people with type 2 diabetes and non-diabetic people	0.318	198	1.56	0.15
Type D personality in people with high blood pressure and non-diseased people	0.230	198	1.64	0.14

Table 2 illustrates a significant difference in C personality type scores (T=4.45, P<0.001) among individuals with type 1 diabetes compared to those without diabetes (T=9.52, P<0.001), as well as between individuals with type 2 diabetes and those who do not have diabetes (T=5.45, P<0.0001). Furthermore, a significant difference is observed between individuals with type 1 diabetes and non-diabetic individuals in personality type D scores (T=4.96, P < 0.001), whereas no significant difference is detected between individuals with type 2 diabetes and non-diabetic individuals in personality type D scores (T = 1.56, P < 0.05). Correspondingly, there is no significant difference between individuals with hypertension and those without hypertension in D personality type scores (T = 1.64, P < 0.05).

Discussion

Personality plays a crucial role in the intricate interplay between illness and health within individuals. Consequently, it is well within the realm of expectation that various physical ailments can be influenced by specific personality traits exhibited by individuals. It is indeed discernible that certain personality characteristics tend to be more prevalent among individuals suffering from particular diseases, highlighting a correlation between personality types and susceptibility to certain health conditions.

While Safi-khani and Davodi (2010) contended that there exists no significant distinction in terms of personality type C between individuals with diabetes and those without, the current study demonstrates notable variations in the scores of personality type C among patients diagnosed with type 1 and type 2 diabetes as well as non-diabetic individuals. These findings resonate with the conclusions drawn by Ebrahimi et al. (2010), which indicated that individuals with personality type C tend to resort to defense mechanisms such as denial, repression, and self-sacrifice when

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confronted with psychological stressors. Such coping mechanisms may compromise the body's immune system, subsequently leading to the development of psychosomatic disorders.

Furthermore, the study revealed marked differences in the scores of personality type C between individuals with hypertension and those without. The collective evidence strongly suggests a profound association between an individual's personality traits and the manifestation of psychosomatic illnesses as highlighted by Jomehri et al. (2009). Individuals exhibiting high levels of personality type C traits often display passivity, emotional suppression, and a tendency to internalize stress, ultimately feeling despondent and powerless when faced with challenges. These behavioral patterns could potentially contribute to the susceptibility of such individuals to psychosomatic diseases, as suggested by Gogheri et al. (2023).

The research findings underscore a notable contrast in the scores of personality type D between patients diagnosed with type 1 diabetes and non-diabetic individuals. This observation aligns with the outcomes of Afkhami Ardekani et al. (2013), which highlighted the impact of personality type D on fluctuations in the HbA1 variable, a crucial indicator of long-term blood sugar regulation. It can be inferred that individuals characterized by personality type D may have encountered recurring instances of negative emotions and social inhibition from a young age, potentially contributing to their vulnerability to certain health conditions.

In accordance with the findings of this particular study, it is pertinent to make reference to the research conducted by Sobhi et al. (2017), which arrived at the conclusion that the parents of children diagnosed with diabetes exhibited elevated levels of neuroticism and diminished levels of extroversion in comparison to parents of children without any health issues. Furthermore, Gogheri et al. (2023) asserted that individuals characterized by personality type D are confronted with an escalated susceptibility to various physical ailments. Broadly speaking, it can be posited that individuals classified under type D personality traits tend to engage in fewer health-promoting behaviors and experience a dearth of social support, factors which interconnect with their compromised overall health status as delineated by Denollet (2000).

The outcomes indicated that there is no discernible distinction in the scores of individuals with personality type D among patients diagnosed with type 2 diabetes and individuals without diabetes, aligning with the research findings of Safi-khani and Davodi (2010). The rationale behind the last two findings suggests that individuals with type D personality traits tend to withhold their

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discomfort, avoid seeking medical attention when ill, and feel reluctant to consult a healthcare provider, as noted by Mols and Denollet (2010). Individuals with personality type D exhibit a reluctance to communicate about distressing life events like illness (Mols & Denollet, 2010) and hold the belief that medical treatment has minimal efficacy, rendering them less cooperative than others. Consequently, it can be inferred that individuals with personality type D visit medical facilities less frequently compared to those without this personality type. In essence, individuals with type D traits exhibit a reduced inclination towards medical care, which may explain the lack of significant differences observed among individuals with diabetes or hypertension and those without, attributed to the disinclination of type D individuals towards seeking diabetes management.

The results of this study emphasize the significant correlation between personality types and the prevalence of diabetes and hypertension. Specifically, individuals diagnosed with type 1 and type 2 diabetes demonstrated elevated scores in personality type C when compared to those without diabetes, indicating a potential inclination towards certain personality traits in individuals with diabetes. Furthermore, individuals with type 1 diabetes exhibited higher scores in personality type D compared to non-diabetic individuals, suggesting a plausible association between personality type D and type 1 diabetes. Nevertheless, there was no notable contrast in personality type D scores observed between individuals with type 2 diabetes or hypertension and those without these health conditions. These findings underscore the intricate connection between personality traits and chronic health conditions, proposing that personality type C could be a common denominator among individuals with diabetes, particularly type 1 diabetes.

Several limitations are present in this study that should be taken into account when interpreting the outcomes. Primarily, the sample size was relatively small and confined to individuals from specific clinics and private offices in Zarin Shahr, potentially limiting the representativeness of the findings to the broader population. This limitation could impact the generalizability of the results. Additionally, the causal-historical research design utilized does not permit causal inferences; thus, it remains ambiguous whether personality types play a role in the onset of diabetes and hypertension, or if these health conditions might influence personality traits. Moreover, the reliance on self-reported personality questionnaires may introduce bias, as participants could have responded in a socially desirable manner or misunderstood certain inquiries.

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Subsequent research endeavors should strive to replicate these findings using larger and more diverse samples to bolster the generalizability of the conclusions. Longitudinal studies could offer insights into the causal links between personality types and the emergence of diabetes and hypertension. Furthermore, integrating qualitative methodologies could enrich the comprehension of how individuals perceive their personality traits and health conditions. Exploring the underlying mechanisms that establish connections between personality traits and chronic health conditions, such as stress response or health behaviors, could provide valuable insights. Lastly, delving into interventions tailored to specific personality types might present innovative strategies for managing diabetes and hypertension, potentially enhancing patient outcomes through addressing the psychological aspects of these health conditions.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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