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Dimensions of neurotic personality and its selected predictors in individuals with arterial hypertension

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Summary

Aim. To assess of the levels of neurotic personality dimensions in a group of patients with arterial hypertension compared to healthy individuals. To test the relationship between the overall neurotic personality score and satisfaction with life as well as tendency to notice and attach importance to the positive aspects of life, experience, and oneself in a clinical sample.

Method. *Neurotic Personality Questionnaire* (KON-2006) by Aleksandrowicz, Klasa, Sobański, and Stolarska (2007), *Satisfaction With Life Scale* (SWLS) by Diener et al., and *the P Scale* by Caprara (2009).

Results. Individuals with arterial hypertension ($N = 81$) are distinguished by significantly higher levels of twenty (out of twenty-four) neurotic personality dimensions than controls without arterial hypertension ($N = 88$). Overall neurotic personality score correlates negatively with life satisfaction and the evaluation of positive aspects of life.

Conclusions. The present study adds to the knowledge on the psychosocial aspects of ill people's functioning and sets directions of work for multidisciplinary teams seeking to improve patients' quality of life.

Key words: arterial hypertension, neurotic personality, satisfaction with life

Introduction

Arterial hypertension is persistent high blood pressure equal to or higher than 140/90 mmHg [1]. In medical classification, its primary and secondary forms are distinguished. The primary (idiopathic) form, which affects the majority of patients, has no

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known somatic cause and its etiology is still unclear. The causes that may contribute to its development are believed to be hereditary (associated with the sympathetic nervous system), environmental, psychological and emotional, as well as stress-related factors [2]. The secondary (symptomatic) form is the case when the cause of hypertension is known, such as a kidney, endocrine, or brain disease [3].

As early as in the 1930s, Franz Alexander [4] pointed out that there was a relationship between arterial hypertension (Lat. *Hypertonia arterialis*) and repressed hostility. Further studies supported the relationship between blood circulation system reactivity and psychological variables such as emotions, stress, and specific personality traits [5, 6]. In pathophysiology, the relationship between personality traits and arterial hypertension is usually explained in terms of three mechanisms: excessive reactivity of the blood circulation system, neurohormonal mechanisms and behavioral factors. According to the first explanation, which is the best supported one, individuals with blood circulation system hyperreactivity respond even to weak stressful stimuli with heightened activation of the hypothalamic–pituitary–adrenal (HPA) axis and with an activation of the sympathetic nervous system [7]. The second explanation postulates a link between the concentration of hormones and neurotransmitters responsible for the level of arterial blood pressure and personality profile [8]. Finally, the behavioral theory postulates a relationship between hypertension development and abnormal health behavior [9, 10].

The existing literature points to numerous psychological characteristics of individuals that may be of importance in the development of cardiovascular diseases, including arterial hypertension. The most often mentioned ones include: neuroticism, anger/annoyance, anxiety/uneasiness, depressiveness, social maladjustment, alexithymia, and traits characteristic of Type A or Type D behavior patterns [6, 8, 11]. Still, the existence of the so-called hypertensive personality remains a subject of controversy among researchers [8], although arterial hypertension itself, classified as a psychosomatic disease, is one of the most common diseases of affluence, with nearly one billion people aged over 25 suffering from it [12]. It is estimated that 20% of the adult population in Poland suffers from arterial hypertension [1].

It should be stressed that some studies showed a positive relationship between arterial hypertension and anxiety disorders [13, 14]. Moreover, based on the results of their meta-analysis of cross-sectional studies, Pan et al. [15] concluded that anxiety and arterial hypertension were significantly correlated with each other. Other studies, by contrast, revealed no relationship [16] or signaled that this relationship did exist but only in the case of dispositional anxiety, not in the case of state anxiety [17].

Faced with the small number of studies on the relationship between psychosocial factors and blood pressure [18] and with the lack of unambiguous data concerning the personality profile of patients with arterial hypertension, we decided to measure the levels of neurotic personality dimensions in this group of patients in comparison with

healthy controls. We assumed that there were differences in all neurotic personality dimensions between ill and healthy individuals – that the clinical group would be characterized by higher levels of these dimensions than the control group (hypothesis 1). We also assumed that in individuals with arterial hypertension the overall neurotic personality score was related to satisfaction with life as well as to a tendency to notice and attach importance to the positive aspects of life, experience and oneself (hypothesis 2). Neurotic personality dimensions should correlate negatively both with satisfaction with life and with positive orientation. Finally, the lack of satisfaction with life or the lack of a positive view of oneself and the surrounding reality may be predictors of neurotic personality disorders (hypothesis 3).

Material

The study included 81 patients (G_{clin}) diagnosed with arterial hypertension undergoing treatment at the Internal Medicine and Arterial Hypertension Ward in the Autonomous Public Provincial Polyclinical Hospital in Szczecin and at the Hypertensiology and Internal Medicine Clinic in the Tadeusz Sokołowski Autonomous Public Clinical Hospital No. 1, Pomeranian Medical University in Szczecin. The clinical group consisted of 46 men (56%) and 35 women, aged 18–80 ($M = 48.02$; $SD = 14.01$). The patients were undergoing pharmacotherapy, particularly monotherapy or combined treatment. The most often used medicines in their treatment were: thiazide diuretics, beta-adrenolytics (first-, second-, and third-generation), calcium channel antagonists, angiotensin-converting-enzyme inhibitors, and AT1 receptor blockers. Some patients reported comorbid medical conditions, such as: allergy (1), atherosclerosis (1), hypokalemia (1), hypocalcemia (1), diabetes (6), depression (1), blood coagulation disorders (1), Lyme disease (1), and nephropathy (1). The patients did not have a psychiatric diagnosis.

The control group (G_{contr}) included individuals without arterial hypertension ($N = 88$), aged 20–72, including 52 women (59%) and 36 men. Their mean age was $M = 42.73$ ($SD = 13.37$). A few participants reported other ailments or a history of other diseases: cancer (1), multiple sclerosis (1), myocardial infarction (1), diabetes (1), gastroesophageal reflux disease (1), cataract (1), and atherosclerosis (1). To select participants for the control group, we applied purposive sampling. In both groups there was a predominance of participants with secondary education ($G_{clin} = 38$ vs. $G_{contr} = 39$), followed by higher ($G_{clin} = 23$ vs. $G_{contr} = 33$), vocational ($G_{clin} = 14$ vs. $G_{contr} = 15$), and primary education ($G_{clin} = 6$ vs. $G_{contr} = 1$).

The study was conducted with the subjects' consent, and the subjects were assured that the collected data would be treated as confidential. The research project received approval from the Bioethical Committee of the Institute of Psychology, University of Szczecin (KB 5/2017).

Method

In order to test the hypotheses, we used

1) *The Neurotic Personality Questionnaire* (KON-2006) by Aleksandrowicz et al. [19]. It is an instrument which measures the supposed areas of personality that may contribute to the development of neurotic disorders (Table 1). The participant specifies to what extent a particular item from the total set of 240 items is true about him or her by giving a 'yes' or 'no' answer. The reliability of the instrument in the present study turned out to be high (Cronbach's α was 0.93 in the group of patients with arterial hypertension, and in the control group the internal consistency of answers was 0.88).
2) *The Satisfaction With Life Scale* (SWLS) by Diener et al. (Polish adaptation: Z. Juczyński) [20] is used to analyze subjects' satisfaction with their current life. The scale consists of five items rated on a 7-point scale, from 1 = 'strongly disagree' to 7 = 'strongly agree'. The higher the score (min. 5 points, max. 35 points), the higher the sense of satisfaction with one's life. Cronbach's α reliability coefficient for the whole scale was acceptable: α = 0.78 for the clinical group and α = 0.81 for the control group.
3) *The P Scale* by Caprara (2009) (Polish adaptation: Łaguna, Oleś, Filipiuk, 2011) [21] is an instrument used to measure tendency to notice and attach importance to positive aspects of life, experiences, and oneself. The method consists of eight items, and item 4 is reverse coded. The respondent indicates on a 5-point scale how strongly he or she disagrees (1) or agrees (5) with the content of a given item. The reliability coefficient was α = 0.91 for the clinical group and α = 0.89 for the control group.

The statistical analyses necessary to test the hypotheses were performed in IBM SPSS Statistics, version 20. We computed descriptive statistics for quantitative variables, tested the normality of their distributions, as well as performed Student's *t*-tests for independent samples and Pearson's *r* correlations. We applied stepwise multiple regression analysis, with a significance threshold of $p < 0.05$. Results significant at $0.05 < p < 0.1$ were considered significant at the statistical trend level.

Results

In accordance with the research objectives, we began by investigating if the subjects with arterial hypertension (the clinical group) and healthy subjects (the control group) differed in terms of neurotic personality dimensions (hypothesis 1). The results of the comparison – namely, the values of arithmetic means (*M*) and standard deviations (*SD*) for particular scales of the questionnaire as well as the values of Student's *t*-test, *p* levels of significance, and Cohen's *d* – are presented in Table 1.

We found statistically significant differences in the case of twenty out of twenty-four dimensions of neurotic personality measured by the KON-2006. The values of Cohen's *d* show that, in most cases, effect size is high or moderate. Only in three cases the effect is relatively weak, and in four cases it is very weak (Table 1). To a very high degree, the obtained results confirm hypothesis 1.

Table 1. **Levels of neurotic personality dimensions in the control group and in the clinical group**

	Control group (N = 81)		Clinical group (N = 88)		t	p	Cohen's d
	M	SD	M	SD			
1. Feeling of being dependent on others	23.71	2.79	27.01	3.68	6.501	0.000	-1.010
2. Asthenia	17.13	1.90	19.69	2.73	6.985	0.000	-1.088
3. Negative self-esteem	16.57	2.53	18.75	3.43	4.654	0.000	-0.723
4. Impulsiveness	21.88	2.57	25.23	3.42	7.218	0.000	-1.107
5. Difficulties in decision making	15.62	2.06	16.62	2.37	3.568	0.000	-0.450
6. Feeling of alienation	18.03	2.71	19.71	3.86	3.251	0.001	-0.503
7. Demobilization	29.00	3.68	28.90	3.48	-0.179	0.858	0.027
8. Risk-taking tendency	19.27	2.12	20.28	2.99	2.515	0.013	-0.389
9. Difficulties in emotional relations	17.81	1.77	17.65	1.92	-0.576	0.565	0.086
10. Lack of vitality	29.35	2.60	29.96	3.18	1.368	0.173	-0.210
11. Feeling of life helplessness	22.57	3.61	23.25	3.38	1.258	0.210	-0.194
12. Feeling of lack of influence	16.43	2.13	19.25	2.87	7.211	0.000	-1.115
13. Lack of inner locus of control	26.02	3.27	27.12	3.57	2.089	0.038	-0.321
14. Imagination, fantasizing	16.85	2.07	19.60	3.57	7.707	0.000	-0.942
15. Feeling of guilt	14.12	1.84	16.60	2.26	7.751	0.000	-1.203
16. Difficulties in interpersonal relations	16.39	1.95	17.62	2.39	3.643	0.000	-0.563
17. Envy	17.71	2.41	20.45	3.20	6.245	0.000	-0.967
18. Narcissistic attitude	17.73	2.53	19.93	3.35	4.777	0.000	-0.741
19. Insecurity	18.01	2.46	20.32	2.86	5.592	0.000	-0.865
20. Exaltation	17.43	2.19	20.04	2.64	7.020	0.000	-1.076
21. Irrationality	13.44	1.74	14.98	2.11	5.194	0.000	-0.796
22. Meticulousness	10.61	1.60	12.18	1.91	5.789	0.000	-0.891
23. Pondering	14.09	1.93	15.86	1.92	5.954	0.000	-0.919
24. Feeling of overload	12.63	1.74	13.71	1.98	3.753	0.000	-0.579

Source: authors' own research

In the next step, we checked if there was a relationship between the overall neurotic personality score and satisfaction with life as well as the tendency to notice and attach importance to the positive aspects of life, experience, and oneself in individuals with arterial hypertension (hypothesis 2). Pearson's *r* correlation (Table 2) showed that both in the clinical group and in the control group the overall neurotic personality score (KON-2006) correlated negatively with satisfaction with life ($r_{co} = -0.229$* and $r_{cl} = -0.392$**) and positive orientation ($r_{co} = -0.252$* and $r_{cl} = -0.223$*), which supports hypothesis 2.

In order to deepen the discussed correlation analyses, we checked if both factors allowed predicting the overall level of personality disorder in both groups. For this purpose, we applied stepwise linear regression analysis. We entered satisfaction with life and positive orientation as explanatory variables. The obtained results show that in the case of individuals suffering from arterial hypertension both variables are predictors which alone explain the highest percentage (10%) of total variance in the overall neurotic personality disorder score ($\Delta R^2 = 0.101$; $R = 0.352$, $F(80, 2) = 5.503$; $p = 0.001$). The values of β coefficient show that lower levels of positive orientation ($\beta_{P\text{-}Scale} = -0.267$) and satisfaction with life ($\beta_{SWLS} = -0.246$) are potentially related to overall level of neurotic personality disorders. In the case of individuals from the control group, only satisfaction with life turned out to be a predictor, explaining 14% of the variance ($\Delta R^2 = 0.144$; $R = 0.392$, $F(87, 1) = 15.620$; $p = 0.001$). This result suggests that lower satisfaction with life may ($\beta_{P\text{-}Scale} = -0.392$) contribute to higher levels of dimensions characteristic of neurotic personality. This means that hypothesis 3 was also confirmed.

Discussion

The present study showed that individuals with arterial hypertension exhibited a higher level of difficulties in interpersonal relations than controls did. These results are similar to those obtained in previous studies, in which it was found that negative social interactions were associated with short-term blood pressure increase in young adults and with long-term blood pressure increase in older patients [22]. Smith [23] observes that experiencing frustration in the face of other people's successes and achievements may have an influence both on physical fitness and on mental health. The results of studies conducted among tribal peoples that had contact with Western lifestyle revealed that their members were characterized by higher blood pressure than communities that were not in touch with Western culture. Many causes of these differences were mentioned, such as: acculturation anxiety, information overload and envious resentment [24]. Moreover, the analyses show that suppressing negative emotions not only can contribute to the development of hypertension, but also it is related to worse outcomes of hypertension treatment [25]. The higher insecurity in individuals with hypertension and their mistrust of others may be due to perceiving themselves

as misunderstood by their environment. Empirical research shows that they perceive themselves as 'fighting a losing battle' [26]. In consequence, this leads to a considerable decrease in self-confidence and satisfaction with life as well as to an increase in fatalistic reactions. Insecurity may also be accompanied by traits characteristic of Type D personality. Compare et al. [27] stress that, from the clinical point of view, individuals with this type of personality have a tendency to worry, perceive the surrounding reality in bleak colors, and feel unhappy and mistrustful. At the same time, they avoid expressing negative emotions for fear of being rejected or disapproved of by others. As a result, they have fewer friends and feel uncomfortable in the company of strangers.

The literature on the subject links loneliness and social isolation with the chronic weakness of the cardiovascular system, heart diseases and general mortality [28]. Our study showed that feeling of alienation was also significantly higher in individuals with arterial hypertension than in the control group. Hawkley et al. [29] draw attention to the fact that the physiological effects of chronic loneliness accumulate gradually and accelerate the increase in systolic blood pressure. The result that may be surprising in the context of arterial hypertension is the higher tendency to take risks, manifesting itself in perceiving oneself as a person unafraid of new situations. It often happens, however, that patients underestimate the risk, particularly when they evaluate events or activities as more familiar and controllable. Besides, this result can be tentatively explained by the relationship between arterial hypertension and Type A as well as Type D personality, in which the tendency to take risks is a significant component.

It is also observed, however, that in the case of arterial hypertension – just like in other chronic diseases – the feeling of being dependent on others is likely to occur especially in those patients who find it difficult to adapt to the disease and treat it as a defeat rather than a challenge. Their self-esteem decreases, inefficiency appears, and negative emotions grow [30]. Such behavior may be accompanied by asthenia, manifesting itself in passiveness and dissatisfaction with life. Studies on the relationship between cardiac functioning and asthenia show that arterial hypertension is comorbid with chronic fatigue [31], and excessive fatigue may be an early symptom of cardiac insufficiency [32]. As regards self-esteem, analyses performed by Italian and Polish scholars [33, 34] reveal that higher overall cardiovascular risk is associated with low self-esteem, particularly in individuals with Type A or Type D personality. Low self-esteem in the context of ill-health condition is related to worse basic cardiac activity in individuals with cardiac insufficiency and ischemic disease.

In patients with arterial hypertension the feeling of lack of influence is one of the strongest factors differentiating them from healthy controls. This result may be linked with the ill people's system of beliefs. A sense of control over chronic illness influences both physiological and psychological aspects of the illness. It seems that the sense of influence may enhance behaviors associated with patients' care about their health and well-being [35]. A study by Pickett et al. [36] revealed that the patients

with hypertension who believed that stress or external factors caused hypertension less often engaged in healthy behaviors in the form of regular doctor visits, taking medicines, and following an appropriate diet. The lack of influence may also stem from a deficit in internal locus of control. The classic study by Naditch [37] confirms that high dissatisfaction and external locus of control are related to arterial hypertension. Polish scholars [38, 39] conclude that the belief in having influence on and control over the course of events is a factor that allows the individual to overcome difficulties and seems to be crucial in deciding on the treatment. External locus of control, by contrast, co-occurs with less functional ways of coping, with negating the symptoms of disease, and with a decrease in behaviors significantly influencing the course of therapy and rehabilitation.

Moreover, developing grandiose ideas and faith in an unexpected change of the problematic situation may stem from an avoidant coping style [40–42]. Arterial hypertension may also be accompanied by negative emotions, including a feeling of guilt. Blaming oneself for one's behaviors or character traits in the context of illness may be used by patients to suppress anger or hostility, particularly in primary hypertension [22, 43, 44]. Among women with Type A personality suffering from hypertension the level of guilt was higher than in men, who in turn exhibited a higher level of suspiciousness [45]. Being guided by irrational cognitive schemas and wishful thinking is linked with an avoidant style of coping with difficult situations. For example, Wright and Sweeney [46] report that individuals with higher diastolic blood pressure more often use strategies marked by irrationality as well as ignoring and underestimating danger than individuals with lower blood pressure.

The score on exaltation, which consists in perceiving oneself as a very sensitive person, with changing moods, seeking support in other people, turned out to be higher in the clinical group than in the control group. Given that the characteristics making up exaltation resemble the personality trait of neuroticism, manifesting itself, among other things, in a tendency to experience sensitivity and low emotional resistance, the relationship between exaltation and hypertension is supported by numerous empirical studies [47]. A high level of neuroticism is a significant predictor of deaths caused by cardiovascular diseases [48, 49] and mortality among cardiac patients [50, 51]. Pondering, consisting in a tendency to brood over oneself and one's behavior, turned out to be significantly higher in patients with hypertension than in controls. This result is in line with studies on the relationship between arterial hypertension and thinking about unpleasant events. Other authors [52, 53] found that the mental representation of a stressful event and prolonged ruminations can activate the physiological system in a way that resembles the effect of chronic stress, causing a risk of hypertension. Patients with hypertension scored higher also on meticulousness, manifesting itself in a tendency to be pedantic, uncertain, as well as perfectionistic in one's thoughts and actions. Albert et al. [54] observed that students with a higher level of perfectionism

were more susceptible to physiological problems associated with stress reactivity. Moreover, their results confirmed the short-term and long-term consequences of perfectionism for cardiovascular functioning as well as increased systolic and diastolic blood pressure. Powell [55] highlights that people at risk of developing hypertension are usually energetic, determined, ambitious, competitive, and time-conscious individuals living a fast and stressful life.

The group of patients with arterial hypertension scored higher also on narcissistic attitude, manifested in perceiving oneself as a person deserving special privileges, in a sense of superiority, and in egocentrism. Some studies show that individuals differing in the level of narcissistic behavior exhibit different patterns of autonomous nervous system activity and cardiac arrhythmia. Explicitly manifesting narcissistic attitudes is associated, for instance, with extended pre-ejection period [56]. Analyses examining the role of psychological variables in pathological processes confirm that the psychological factors playing a significant role in the course of the illness and treatment of patients with arterial hypertension include quick-temperedness and irritability. Previous studies reveal that individuals suffering from arterial hypertension score significantly higher on impulsiveness, depression and anger than healthy controls [45]. Additionally, as scholars point out [57, 58], in cases of arterial hypertension we are dealing with a deficit of thiamine, whose insufficient level can lead to worse memory functioning, irritation, depression, insomnia, low concentration, and lack of initiative. Hypertension may also be comorbid with premature brain aging, symptoms of which include slowed-down information processing, difficulty in decision making, apathy, mood disturbances, and forgetfulness [59].

It is therefore hardly surprising that the general feeling of overload, manifesting itself in demanding too much from oneself, being bound by obligations and duties, and living in accordance with other people's expectations, can be a significant risk factor for arterial hypertension. Complex analyses show that tensions associated with demands at work or other forms of psychological pressure often lead to cardiovascular diseases [60]. Another dimension differentiating the two groups is the tendency to ponder over one's behavior. Not only focusing on the current stressors but also recalling negative past events result in prolonged rumination potentially leading to autonomous activation, similar in strength to the response to the original event, causing hypertension [61].

The results showed that, as postulated in hypothesis 2, in individuals with arterial hypertension the overall neurotic personality score was negatively related to satisfaction with life as well as to the tendency to notice and attach importance to the positive aspects of life, experience, and oneself. Hypothesis 3 has also been confirmed, since both factors were negative predictors of neurotic personality disorders. The results are supported by previous studies, which revealed that the sense of happiness seemed to be conducive to mental health and that a high level of optimism prevented cardio-

vascular diseases [62, 63]. In classic psychosocial research, Weiss et al. [64] reported that individuals with neurotic personality were frequently found among patients with arterial hypertension. Hildingh and Baigi [65] observed that anxiety and sleep disturbances were higher and the level of satisfaction was lower in the group of patients with hypertension than in the control group. Although, according to Pan et al. [15], the mechanism between anxiety and arterial hypertension is complex, it is generally legitimate to say that anxiety increases blood pressure, total peripheral resistance, the activity of the sympathetic nervous system, plasma renin activity, and the concentration of lipids in the blood, thus leading to low well-being.

This study presents some limitations. In hypothesis 3 it was assumed that a lower level of life satisfaction may favor a higher level of neurotic personality dimensions. However, in future studies, it would be desirable to verify whether the higher level of neurotic personality dimensions may affect the lower life satisfaction. Such an approach would require a significant enlargement of the research group in order to implement relevant statistics. In addition, it can be assumed that patients' quality of life is lower not only because of hypertension but also because of comorbidities. Therefore, in a further perspective it would be justified to analyze not only the role of psychosocial factors, but also sociodemographic variables.

Conclusions

1. A higher level of neurotic personality dimensions differentiates patients with arterial hypertension from the group without arterial hypertension.
2. The level of neurotic personality is associated with perceived satisfaction with life.
3. Satisfaction with life and the tendency to notice and attach importance to the positive aspects of life are negative predictors of neurotic personality. The result has significant practical implications, important for interdisciplinary medical and psychological teams seeking to improve patients' quality of life.

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