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**Personality correlates of health behaviors among men  
training recreationally in the interdisciplinary spirit  
of health pedagogy**

**Osobowościowe korelaty zachowań zdrowotnych wśród mężczyzn  
trenujących rekreacyjnie w interdyscyplinarnym duchu  
pedagogiki zdrowia**

**Abstract:** The aim of the study was to identify the personality traits (according to the so-called Big Five personality model) in relation to healthy behaviour among amateur athletes. One hundred physically active men participated in the study. Health Behaviour Inventory questionnaire developed by Juczyński was used to assess health-related behavior, and the NEO-Five Factor Inventory (NEO-FFI) developed by Costa and McCrae, in the Polish adaptation, was used to determine principal personality dimensions. Significant correlations between the level of health-related behavior or some kind of them and personality dimensions were observed. Two clusters (personality profiles) related to prohealthy behaviours were separated. Observed correlations between health behaviours and personality traits of physically active men confirm the validity of the research and a need for healthy behaviour education. Understanding the associations between healthy behaviours and

personality traits can be used in health pedagogy, including development of effective methods of education and health prophylaxis in amateur athletes.

**Keywords:** health pedagogy, healthy behaviour, personality, sport.

### **Introduction**

In recent years, an increasing number of programmes have been in order to improve the health of the population not only in Poland, but also worldwide. At the same time, there has been a growing interest in physical activity and proper diet. In fact, one could say that healthy lifestyle has become fashionable. Effective and reliable (based on the results of scientific research and not driven by aggressive advertising) health education and prevention seem therefore to be of key significance. These activities should be aimed at various groups within the society, including adults, who will be able to pass on this knowledge, along with correct behaviour patterns, to children from an early age. These issues are most often dealt with by specialists in various scientific fields, e.g. human nutrition (e.g. nutritionist), physical culture (e.g. instructor, trainer), human sciences (health education and health pedagogy in a broader sense). The issue of the determinants of health behaviours (as well as of their effective change) is undoubtedly complex and extensive. One of the important psychological aspects related to the acquisition of different health habits is human personality. There is still little research available on amateur athletes (i.e. those undertaking physical activity as a sport or leisure activity in their free time) that would take into account a multifaceted approach to their health. They constitute a specific group of people for which all health aspects are worth considering individually due to the very different lifestyles of its members. Perhaps knowledge of the most individualised aspects of human functioning, i.e. personality traits, could prove helpful in understanding the individual choices made by amateur athletes in the area of health behaviours and in developing the most effective educational message, maximally adapted to the audience. It seems reasonable to attempt to determine the personality factors associated with the propensity to live a healthy lifestyle on the basis of an analysis of the health habits of amateur sportspeople, as a group that potentially fits into the framework of a pro-healthy lifestyle.

### **Health pedagogy**

Education for healthy lifestyles is fundamentally interdisciplinary in nature (Demel, 1980, pp. 5-6). The very concept of health education, and in theory - of health pedagogy - was created as a result of the interaction

of educational thought in medicine (especially social medicine) and health thought in pedagogy (social pedagogy), with authors on the Polish ground from both the pedagogical side (Grzegorz Piramowicz), and from the medical side (Jędrzej Śniadecki) (Demel, 1980, p. 81). In understanding the formation of health behaviours and the skilful introduction of changes in them, a multifaceted understanding of the determinants of such behaviours is essential. Health psychology (Heszen and Sęk, 2007), which deals with the development of complex systemic models, also comes to the rescue, so that actions taken in health pedagogy can be more effective. The resources of the psychology of individual differences facilitate the search for personality determinants of human behaviour, which can provide a valuable psychological input and complement the hitherto analysis in the field of health pedagogy. Maciej Demel, the creator of the concept of health education in Poland, specialising in both physical education theory and health pedagogy, discussed health education also in terms of personality (e.g. needs, beliefs, attitudes) (Demel, 1980, pp. 108-117).

The search for psychological determinants of health behaviour has become particularly important since it was shown that human health depends primarily on individual lifestyle (50%) and to a lesser extent on the environment, human biology (hereditary factors) and health care (Lalonde, 1974). And lifestyle is, in turn, significantly influenced by health behaviours.

### **Health behaviours**

There are many definitions of health behaviours. According to the WHO, *health behaviours are „intentional actions consciously taken by a person to protect, strengthen, increase the potential of his or her health, regardless of their effectiveness”* (WHO, 2019). They can be classified according to their function into pro-health behaviours and anti-health behaviours (Heszen and Sęk, 2012, p. 93). Some researchers refer to health behaviours as „health-oriented behaviours” (Green and Kreuter, 2005) or „pro-health behaviours”, to strengthen their „health-positive” understanding (Woynarowska, 2017). Health-oriented behaviours most often include a healthy diet, moderate, regular physical activity, recreation and rest, as well as preventive behaviours (especially preventive screenings) (Puchalski, 2010; Woynarowska, 2017). The Polish population is characterised by a discrepancy between a high declared value attributed to health and a rather low overall level of individual health-care (Gruszczycska, Bąk-Sosnowska and Plinta, 2015; Woynarowska, 2017). The unsatisfactory effects may be mainly due to the fact that the educational measures undertaken account poorly for the complex determinants of health

behaviours of the persons subjected to the intervention (e.g. poor adaptation of interventions to the specific needs and individual characteristics of the recipient, e.g. their personality).

### **Personality and health behaviours**

Systematic research is still being conducted to clarify the role of personality in the formation of health and illness, including the health behaviour factor (Cheng, Weiss and Siegel, 2015; Huntsinger and Luecken, 2004; Jaworski and Rozenek, 2016; Maćkowska and Basińska, 2010; Sinaj, 2015). A contemporary view of personality defines it as the totality of thoughts, emotions and behaviours that determine the direction and pattern (consistency) of a person's life (Cervone and Pervin, 2011, p. 10). Personality is an important determinant of human health (Ogińska-Bulik and Juczyński, 2008, pp. 94-100).

A special status among the personality characteristics associated with health/disease has been earned by the dimensions of the five-factor model of personality (*Big Five*) (McCrae and Costa, 1997), comprising a clear, integrative and orderly concept of universal personality structure (Oleś, 2015, p. 150). The Big Five model consists of five main dimensions (McCrae and Costa, 2005; after Oleś, 2015, p. 155): *extraversion* - includes the amount and intensity of interpersonal interactions, activity level, need for stimulation; *neuroticism* - refers to adaptability vs. emotional instability, ranging from composure and emotional stability to a tendency towards mental discomfort, unrealistic ideas, maladaptive stress response; *openness to experience* - includes active search for new experiences, tolerance and exploration of the unknown; *agreeableness* - refers to the quality of an individual's interpersonal references on a continuum from sympathy to antagonism in thoughts, feelings and actions; *conscientiousness* - includes an individual's degree of organisation, persistence and motivation in goal-directed behaviour, contrasting reliable and demanding people with those who are undisciplined and unorganised.

Studies aiming at the establishment of links between health behaviours and personality do not always provide clear-cut solutions (Fronczyk, 2004; Steptoe and Wardle, 2017). There is great complexity in the processes determining the relationship between health behaviours and personality. Personality influences health most often in interaction with stress and coping with challenged - it determines the experience of stressful situations, their evaluation, and also influences the preferred approaches to cope with

difficulties and, consequently, the health behaviours displayed (either conducive or detrimental to health) (Ogińska-Bulik and Juczyński, 2008, p. 173).

In the case of healthy adults, research findings mostly indicate associations of health behaviours with agreeableness and neuroticism (Sinai, 2015), extraversion (Cheng, Weiss and Siegel, 2015) or emphasise the interdependence of traits such as conscientiousness, perseverance or control. Other authors suggest that health-promoting importance is mainly attributed to conscientiousness (positively related to adherence to medical recommendations), but also to extraversion and openness to experience, while neuroticism and agreeableness seem to be associated more with illness than with health (Ogińska-Bulik & Juczyński, 2008, p. 155). Most of the research is concerned with the impact of personality on the development of illness (Maćkowska and Basińska, 2010; Olszewski, 2008; Szczukiewicz, 2014). However, there is little research that identifies the personality profile of amateur athletes (Unrug and Malesza, 2013). In contrast, for professional sportspeople, personality has been found to correlate with health behaviours, such as correct eating habits, preventive behaviours, health practices and positive mental attitude (Lipowski and Bieleninik, 2014).

### **Transformational learning in health education**

In the process of health education it may be valuable to consider transformational learning according to the theory by Jack Mezirow<sup>1</sup>. The theory examines the learning process in adults leading to a profound transformation in the way we perceive reality and introduce changes (Mezirow, 1991, p. 11). Using Mezirow's terminology, in the process of transformational learning, there occurs a transformation in the individual frame (system) of reference (*frame of reference*), leading to the liberation of the individual from unreflective use of fixed patterns of the attribution of meanings in interpreting his or her experience and basing one's own actions on a conscious, critical reflection. Transformation takes place in the form of 10 phases. Among them we find 1) the phase of exploring the possibility of choosing new roles, interpersonal relations and actions, 2) the phase of taking on new roles for a trial, and 3) the phase of building competence and self-confidence in new roles and relations (cf. Pleskot-Makulska, 2007). Learning the desired health

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<sup>1</sup> J. Mezirow's theory of transformational learning is one of the most important contemporary theories operating in adult education (cf. Brookfield, 2000, among others), still subject to discourse and evolving (cf. Chmielecka 2019). The author of the theory is the recipient of awards for outstanding publications on adult education (cf. Pleskot-Makulska, 2007).

behaviours can also take the form of transformational learning, taking into account the personality characteristics of the learner.

### **Purpose of the study and research hypotheses and questions**

The aim of the present study is to determine the personality traits (with reference to the five-factor model of personality) conducive to a healthy lifestyle in men engaged in recreational sports training. The following hypotheses and research questions were formulated:

1. The health behaviour of men who train recreationally correlates with personality traits.
  - 1a) Is greater intensity of health behaviours favoured by the intensity of particular personality traits?
  - 1b) Does the intensity of health behaviours vary in accordance with the intensity of individual personality traits?
2. The health-promoting lifestyle of men engaged in recreational training is supported by a specific personality profile.

### **Subjects and methods**

The study was performed on 100 men aged 18-60, training any sport recreationally on a regular basis, i.e. at least once a week for most months of the year, for a minimum of one year.

Participants were selected using a non-random (purposive) selection method (Łobocki, 2010). Respondents were recruited in Warsaw martial arts sports clubs and among participants in organised team games, as well as using the snowball method (Jabłońska & Sobieraj, 2013) by having respondents hand in survey questionnaires to other amateur athletes they knew. All respondents practised their chosen sport at an amateur level, i.e. in their leisure time, and practising sport was not related to its competitive or professional nature. Participation in the study was voluntary and anonymous. The study was approved by the Bioethics Committee at the Military Institute of Hygiene and Epidemiology (Komisja Bioetyczna przy Wojskowym Instytucie Higieny i Epidemiologii) in Warsaw (5/II/2018).

The survey was conducted using three survey questionnaires:

1. The Inventory of Health Behaviour (IHB) - by Zygfryd Juczyński (2001) - was used to assess the overall intensity of health behaviours and the intensity within four types of health behaviours, i.e.: correct eating habits (CEH), preventive behaviours (PB), positive mental attitude (PMA) and health practices.



2. The NEO-FFI Questionnaire - the Polish adaptation (Zawadzki, Strelau, Szczepaniak and Śliwińska, 1998) of Costa and McCrae's NEO-FFI Personality Inventory. The questionnaire consists of 60 statements - 12 for each of the scales analysed: neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. For each, respondents are asked to answer on a 5-point scale: from 1 - „strongly disagree”, to 5 - „strongly agree”.
3. A self-administered survey questionnaire, including questions on physical activity related to sport or recreation (type, frequency and number of hours per week) and a metric (age, height, weight, place of residence, education and nature of work).

The results obtained were transformed and expressed on a sten scale according to the interpretation of the results proposed by the authors of the IHB and NEO-FFI tests. Subgroups were then distinguished according to the overall intensity of health behaviour (low, moderate, high), as well as each of the five personality traits analysed (low, moderate, high).

Statistical analysis of the obtained results was performed using the Statistica 13 computer programme (StatSoft Poland). The conformity of the distribution of variables to the normal distribution was checked with the Shapiro-Wilk test, assuming a significance level of  $\alpha=0.05$ . Then, depending on its result, parametric (analysis of variance with the post-hoc NIR test) or non-parametric tests (Kruskall-Wallis test together with a multiple comparison test, Spearman rank correlation) were applied. In addition, in order to isolate the different personality profiles, cluster analysis was performed using k-means clustering. Due to the small size of the extracted subgroups, the above analyses assumed a level of statistical significance for  $\alpha<0.05$  and statistical trend for  $0.05\leq p<0.1$ .

## **Results**

The mean age of the male subjects was  $37\pm 10$  years, height and weight  $182\pm 6$  and  $85\pm 12$ , respectively. Almost all the study participants had a higher education (85%), the remaining 15% had a secondary education. The vast majority of the study participants lived in a city of more than 100,000 inhabitants (75%), 17% in a city of up to 100,000 inhabitants, and 8% in a rural area. Only 6% of the respondents did not work, the others had white-collar jobs (72%), physical jobs (5%) or mixed white-collar and physical jobs (17%). The amateur athletes surveyed devoted an average of  $5\pm 3$  hours per week to sport- or recreation-related physical activity, on average for  $12\pm 9$  years. Team games (44%) and martial arts (35%) were the most common sports

practised by respondents, followed by running (23%), cycling (15%) and swimming (11%) and other (3%; most commonly crossfit). Nearly half of the respondents (42%) trained in more than one sport.

### Re. hypothesis 1. The health behaviour of recreationally training men is correlated with personality traits

In the study group, significant correlations were found between overall health behaviour intensity and extraversion intensity and three of the four types of these behaviours and individual personality traits (Table 1).

**Table 1.** Relationships between health behaviour intensity and personality traits

Health behaviour		NEU	EXT	OPE	AGR	CON
General increase in health behaviour	rho	-0,19*	0,23**	0,15	0,06	0,11
	p	0,059	0,019	0,130	0,557	0,265
Correct eating habits	rho	-0,07	0,22**	0,21**	0,01	-0,03
	p	0,481	0,028	0,034	0,920	0,772
Preventive behaviours	rho	-0,05	0,14	0,12	-0,03	0,27**
	p	0,636	0,174	0,234	0,797	0,006
Positive mental attitude	rho	-0,41**	0,33**	0,08	0,26**	0,24**
	p	<0,001	0,001	0,456	0,008	0,015
Health practices	rho	0,02	-0,03	0,06	-0,01	-0,13
	p	0,863	0,759	0,540	0,893	0,195

rho - Spearman correlation coefficient, p - level of statistical significance, NEU - neuroticism, EXT - extraversion, OPE - openness to experience, AGR - agreeableness, CON - conscientiousness, \*statistical trend, \*\* statistical significance

1a) Is greater intensity of health behaviours favoured by the intensity of particular personality traits?

Of the five personality traits analysed, only the intensity of extraversion was significantly different in relation to overall health behaviour intensity ( $p=0.047$ ), i.e. pro-health attitudes were favoured by higher extraversion intensity - mean extraversion value expressed on a sten scale: 6.69 (high intensity of health behaviour) vs 5.48 (low intensity of health behaviours); for average intensity, the mean value of extraversion was 6.40.

1b) Does the intensity of health behaviours vary according to the intensity of individual personality traits?

The overall intensity of health behaviours did not differ according to the intensity of any of the personality traits. In contrast, trait intensity levels



within the three dimensions (neuroticism, extraversion and conscientiousness) significantly differentiated between types of health behaviour (Table 2).

**Table 2.** Intensity of health behaviours in relation to intensity of personality traits

Personality trait and its intensity		General increase in health behaviours <sup>1</sup>	Correct eating habits <sup>2</sup>	Preventive behaviours <sup>2</sup>	Positive mental attitude <sup>2</sup>	Health practices
NEUROTICISM	Small	82,2	3,43	3,26	3,77	3,26
	Average	79,5	3,3	3,08	3,46	3,43
	Large	75,5	3,31	3,16	2,94	3,18
	p	0,169	0,728	0,461	<0,001**	0,289
EXTRAVERSION	Small	73,9	3,23	2,79	2,96	3,33
	Average	78,6	3,23	3,13	3,37	3,39
	Large	81,8	3,46	3,23	3,66	3,29
	p	0,130	0,273	0,204	0,003**	0,746
OPENNESS TO EXPERIENCE	Small	76,3	3,1	3,1	3,42	3,08
	Average	78,7	3,25	3,07	3,47	3,34
	Large	81,9	3,51	3,26	3,51	3,37
	p	0,279	0,152	0,386	0,923	0,502
AGREEABLENESS	Small	79,5	3,36	3,32	3,38	3,18
	Average	79,8	3,4	3,11	3,38	3,43
	Large	79,9	3,28	3,15	3,65	3,26
	p	0,992	0,740	0,589	0,107	0,291
CONSCIENSCIOUSNESS	Small	75,4	3,31	2,63	3,21	3,42
	Average	80,9	3,44	3,14	3,43	3,47
	Large	79,1	3,21	3,28	3,62	3,11
	p	0,400	0,323	0,033**	0,169	0,022**

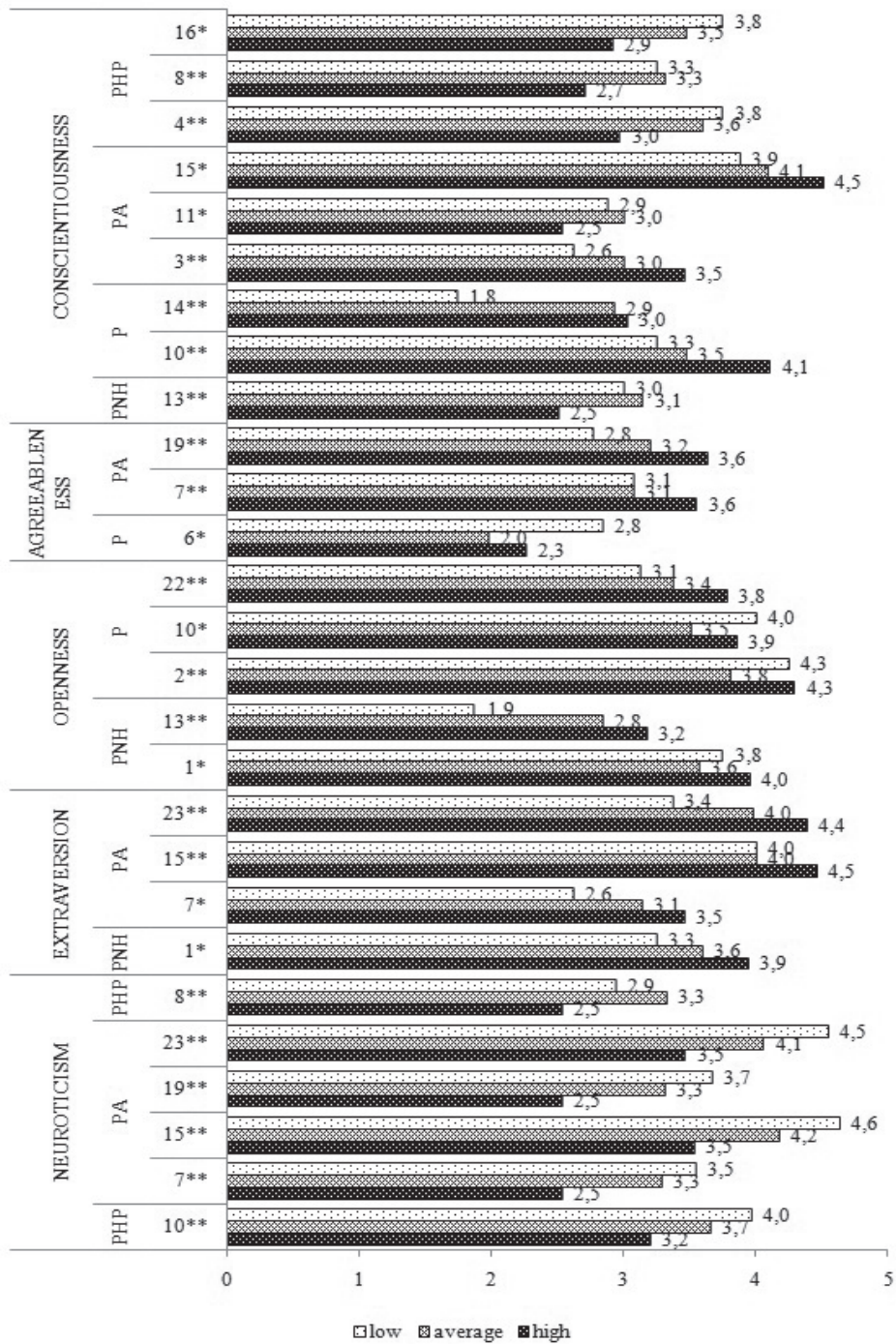
\*\* statistical significance

<sup>1</sup> sum of points for health behaviours from the range 24-120; <sup>2</sup> average for types of health behaviours (from the range 1-5); the higher the value, the higher the intensity of health behaviours

High intensity of neuroticism corresponded to low intensity of positive mental attitude. Respondents with high levels of extraversion were characterised by significantly higher levels of positive mental attitude. Low intensity of conscientiousness was associated with significantly lower intensity of preventive behaviours, although respondents with higher intensity of this trait obtained significantly lower rates of health practices.

Using a detailed analysis of individual health behaviours, 16 of the 24 behaviours were shown to vary significantly according to the intensity

of personality traits (Figure 1), with the most differences observed for conscientiousness and the least for agreeableness.



**Figure 1.** Intensity of individual health behaviours significantly different according to intensity of personality traits

\* statistical tendency, \*\* statistical significance

P – prophylaxis (preventive behaviors); PA - positive mental attitude; PHP – pro-health practices; PNH - proper nutrition habits. 1. I eat a lot of vegetables and fruits. 2. I avoid colds. 3. I take seriously the advice of people expressing concern about my health. 4. I get enough rest. 6. I have written down the telephone numbers of the emergency services. 7. I avoid situations that depress me. 8. I avoid overwork. 10. I follow the medical recommendations resulting from my research. 11. I try to avoid too strong emotions, stress and tension. 13. I avoid eating foods with preservatives. 14. I regularly attend medical examinations. 15. I have friends and a regulated family life. 16. I sleep enough. 19. I avoid feelings such as anger, anxiety and depression. 22. I am trying to obtain medical information and understand the causes of health and disease. 23. I think positively.

**Re. hypothesis 2: The health-promoting lifestyle of recreationally training men is favoured by a specific personality profile**

Of the three personality profiles extracted using cluster analysis, two were identified that favoured the healthy behaviours of the male amateur athletes participating in the research (Table 3, Figure 2):

Profile 1 (cluster 1): low neuroticism, high extroversion, average openness to experience and high conscientiousness,

Profile 3 (cluster 3): moderate neuroticism, moderate extraversion, high openness to experience and moderate conscientiousness.

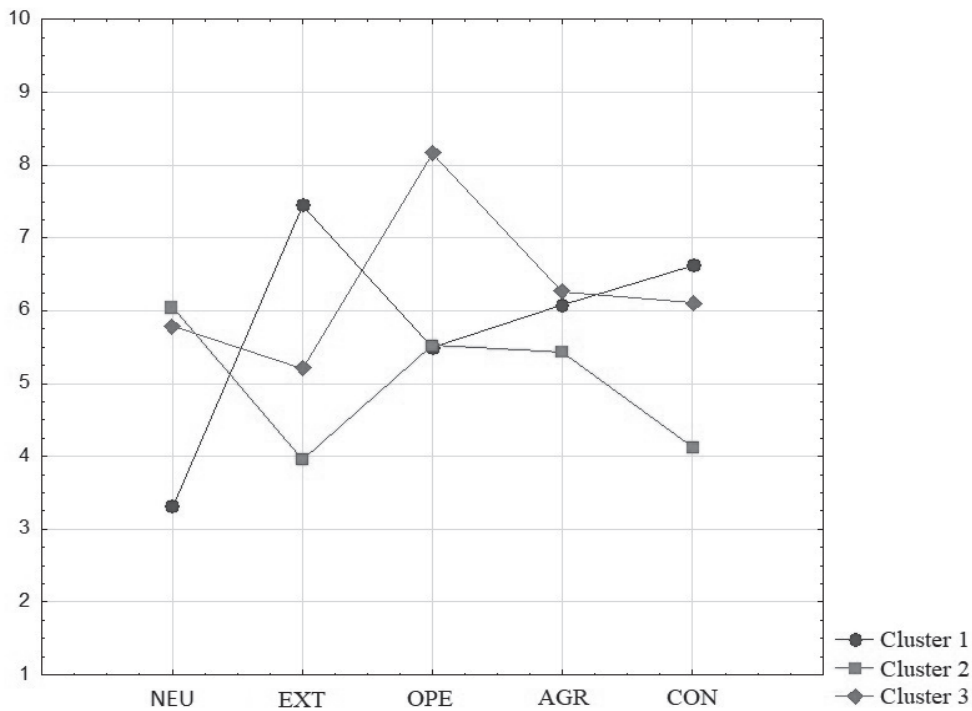
**Table 3.** Comparison of the intensity of personality traits and health behaviours between the identified personality profiles

Personality traits and health behaviours	Cluster 1			Cluster 2			Cluster 3			p
	X	±	SD	X	±	SD	X	±	SD	
Neuroticism [sten].	3,31	±	1,57a	6,04	±	1,82b	5,79	±	2,02b	<0,001**
Extraversion [sten].	7,45	±	1,58a	3,96	±	1,49b	5,21	±	1,44b	<0,001**
Openness [sten]	5,50	±	1,69a	5,52	±	1,34a	8,16	±	1,42b	<0,001**
Agreeableness [sten]	6,09	±	2,09	5,43	±	1,56	6,26	±	2,21	0,282
Conscientiousness [sten]	6,62	±	2,11a	4,13	±	1,60b	6,11	±	1,56a	<0,001**
General increase in health behaviours <sup>1</sup>	81,3	±	10,9a	74,2	±	11,3b	81,9	±	11,8a	0,027**
Correct eating habits <sup>2</sup>	3,38	±	0,70	3,14	±	0,70	3,49	±	0,78	0,245
Preventive behaviours <sup>2</sup>	3,21	±	0,63a	2,83	±	0,69b	3,35	±	0,60a	0,020**
Positive mental attitude <sup>2</sup>	3,66	±	0,55a	3,04	±	0,61b	3,48	±	0,64a	<0,001**
Health practices <sup>2</sup>	3,31	±	0,64	3,36	±	0,51	3,38	±	0,77	0,891

Kruskal-Wallis test (personality traits); analysis of variance (health behaviours)

<sup>a,b</sup> - different letters indicate significantly different results; multiple comparisons test (p<0.05), NIR test (p<0.05), \*\* statistical significance

<sup>1</sup> sum of points for health behaviours from the range 24-120;<sup>2</sup> average for types of health behaviours (from the range 1-5); the higher the value, the higher the intensity of health behaviours



**Figure 2.** Personality profiles extracted using cluster analysis

The overall intensity of health behaviours of subjects characterised by the first and third personality profiles (cluster 1 and cluster 3) was 7% and 10% higher, respectively, than in subjects with the second personality profile (cluster 2), which was characterised by high neuroticism, very low extraversion, moderate openness and low conscientiousness (81.3 and 81.9 vs. 74.2,  $p=0.027$ ). In addition, higher levels of preventive behaviours was observed in these individuals compared to profile two (cluster 2) (3.21 and 3.35 vs. 2.83,  $p=0.020$ ), as well as higher levels of positive mental attitude between all three profiles (3.31 and 3.38 vs. 3.36,  $p<0.001$ ).

## Discussion

The results of the study confirmed both hypotheses, indicating the existence of a relationship between health behaviours and personality traits, as well as isolated personality profiles in a group of 100 men regularly undertaking physical activity through sport or recreation.

A higher overall intensity of health behaviours was supported by a higher intensity of extraversion. As extroversion intensity increased, so did the positive mental attitude of the male respondents and their level of healthy eating habits. As Robert McCrae and Paul Costa point out, the components of extraversion can be divided into three interpersonal traits, i.e. cordiality, sociability and assertiveness, and three temperamental traits, i.e. activity,

sensation seeking and positive emotionality (McCrae and Costa, 2005). This compilation of traits is more strongly associated with health, both physical and mental, than with illness (Ogińska-Bulik and Juczyński, 2008, p. 106). Other research shows that extroverts experience more positive emotions and therefore display better psychological well-being as well as reveal fewer physical ailments, including lower rates of asthma, stomach ulcers, and ischaemic heart disease (Sanderson, 2004, p. 58). Extroverts' characteristic optimism, sense of self-efficacy, ease in maintaining friendly relationships with others and high activity levels are good motivators for health-oriented behaviours. On the other hand, a high need for sensation seeking and sociability may increase the likelihood of engaging in risky behaviours as well.

Our own research showed that high neuroticism was consistently not conducive to health-promoting behaviours. High intensity of this personality trait co-occurred with low level of positive mental attitude and contributed to a personality profile characterised by presenting significantly lower intensity of health-promoting behaviours, compared to personality profiles with lower intensity of neuroticism. Highly neurotic individuals are generally less able to control their urges and cope with stress. They react strongly with anxiety, tension, tend to worry, and often experience states of hostility and anger. They are easily discouraged, show low self-esteem, embarrassment and a sense of confusion in the presence of others (Zawadzki, Strelau, Szczepaniak, Śliwińska, 1998, p. 32). This set of traits, through the specific experience and evaluation of different life situations, may contribute to the development of health-damaging behaviours.

Particularly relevant, in the context of Mezirow's theory of transformational learning, seem to be the difficulties encountered by neurotic people in the area of interpersonal communication. One of the areas of transformational learning cited by Mezirow is communicative learning<sup>2</sup> (Mezirow, 2000, p. 10), where, in the process of interaction, communication partners learn and agree on the meanings they give each other. This process requires attentive interpersonal interactions, which may be much shallower in people with high

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<sup>2</sup> Communicative *learning* is related to the world of social *communication*. Its essence is learning *to* communicate one's own thoughts to others and to understand the messages formulated by other people. This makes it necessary *to* assess the meanings *implicit* in other people's statements and thus to critically evaluate one's own assumptions and communication partner. It is necessary in this situation, for example, to assess the subtext *hidden* in the statement, its literalness or metaphoricity, the credibility of the partner, his or her view of the world, the purpose of *communication*, etc. (Mezirow, 2000, p. 10).



levels of neuroticism. Mezirow emphasises that communicative learning is often more important than instrumental learning (mainly related to testing the truth of hypotheses) for the development of transformational learning. This is because meanings are formed in the process of social communication, in the world of social interaction. Meanwhile, neurotic adults, due to their personality traits, unable to communicate freely with others, lack the opportunity to fully develop transformational learning in themselves, leading to deep and lasting changes in the area of developing health-promoting behaviours. According to Mezirow's theory, unnatural, incomplete interpersonal contacts hinder effective and satisfying learning that incorporates critical self-reflection. To remain mainly within the domain of developmentally earlier formative learning, i.e. learning that takes place without changing one's frame of reference (but replicating behaviours seen in others instead) (Mezirow, 2000), or a possible attempt to abruptly change the interpretive frame of a situation without making a profound change in one's own thinking (e.g. an individual without conviction, transformation of attitudes or views undertakes to engage in amateur sport), may have contributed to noticeable difficulties in displaying health-promoting behaviours and even experiencing negative emotions and low level of positive mental attitude.

The negative correlation between neuroticism and positive mental attitude obtained in our study corresponds with research indicating a strong relationship between personality traits (especially neuroticism and extraversion) and feelings of happiness (Czapiński, 2004). High levels of neuroticism significantly impede psychological well-being. Michael Argyle (2004, p. 103) points out that neuroticism influences self-esteem, which is in turn related to the subjective feeling of satisfaction - low self-esteem means lower life satisfaction, worse relations with others, which directly translates into the presented health behaviours. According to Mezirow (1991, p. 13), the ability to make transformational learning determines actions taken, hopes, but also life satisfaction. Recent research (Sherman, 2021) displays that meta-cognitive awareness (associated with transformational learning) promotes well-being - it brings with it peace of mind and even happiness. Thus, adults deprived of the opportunity for transformational learning to unfold naturally for them in multiple interactions may experience a deterioration in their psychological well-being and sense of satisfaction with learning activities. Introverted individuals with good social relationships may be as satisfied with their lives as extroverted individuals (Mądrzycki, 2020, p. 56), but it is the style of coping with difficulties that mediates the relationship between neuroticism



and well-being (Doyle and Slaven, 2004), and neurotics generally exhibit a maladaptive style of responding to stress.

Other studies (Ogińska-Bulik and Juczyński, 2008, p. 156) also indicate connections between conscientiousness and health-promoting factors. High rates of conscientiousness translate into better health and longer life expectancy, as general responsibility, motivation, diligence and persistence in action facilitate compliance with medical recommendations. In addition, conscientiousness was also found to be the most important determinant of life satisfaction in a group of people with cardiovascular disease. Similar results were obtained in our own study, i.e. high levels of conscientiousness were conducive to a positive mental attitude and the presentation of preventive behaviours. On the other hand, high conscientiousness, combined with low openness and agreeableness and increased neuroticism, favours obsessive-compulsive personality (Ogińska-Bulik and Juczyński, 2008, p. 106). In our own research, a disturbing relationship was also observed in the case of conscientiousness, i.e. people with the highest conscientiousness were characterised by the lowest index of health practices, in particular taking care of sleep, rest and avoiding overwork. This result may suggest that extreme caution is warranted in unilaterally interpreting the significance of the intensity of conscientiousness for health behaviours and, consequently, health status. Indeed, there is a risk that conscientious individuals will pursue their health-promoting tasks at the expense of rest and sleep, thus producing the opposite effect. According to the theory of informal adult education, learning can occur intentionally or unintentionally (Schugenersky, 2000). Self-directed learning, intentionally practised by more conscientious individuals, understood as undertaking physical activity to enhance health, can also be autonomous-selective learning, according to Pierścieniak's (2009) proposed classification of adult behaviour in the field of informal education, only with a different - negative - effect on health. The more conscientious respondents had significantly lower levels of health practices such as: „I avoid overwork”, „I get enough sleep”, while at the same time declaring a higher level of „taking seriously the advice of people expressing concern about my health” and „following the medical recommendations resulting from my examinations”. These results seem to contradict each other, but it should be remembered that the study was conducted in a group of healthy people. The negative effects of the behaviours undertaken, such as insufficient rest or overwork, may only appear after a longer period of time.

Openness to experience, like extraversion, showed a positive association with correct eating habits among men in amateur sport. This result

corresponds to a study conducted with men who train competitively in individual sports (figure skating, gymnastics, strength sports), where a positive relationship between extraversion and normal eating habits was also confirmed (Lipowski and Bieleninik, 2014). The referenced studies also found correlations between correct eating habits and neuroticism (negative correlation) and agreeableness and conscientiousness (positive correlations). Favouring openness to experience with correct eating habits appears to be justified, given the association of this personality dimension with tolerance towards novelty, creativity and resistance to rigidity expressed, for example, in trying new foods (Ogińska-Bulik and Juczyński, 2008, p. 102).

In turn, agreeableness (associated with optimism and friendly relations with others), similarly to extraversion and conscientiousness, favoured positive mental attitude in the study group (with a negative correlation with neuroticism). Analogous results, i.e. positive correlations between positive mental attitude and extraversion, openness to experience, agreeableness and conscientiousness, were obtained by Mariusz Lipowski and Łucja Bieleninik (2014) among men who train combat sports competitively. The same authors showed that also among sailors, an increase in extraversion and conscientiousness co-occurred with an increase in the positive mental attitude of the subjects. Other studies involving athletes have shown negative correlations between neuroticism and positive mental attitude and health practices, as well as positive correlations between extraversion and positive mental attitude and health practices (Pisarek, Gruszkowska, Zagórska, Lenartowicz, 2011).

Among the amateur athletes studied, two personality profiles were identified as favouring a health-conducive lifestyle (understood as the overall intensity of health behaviours), including preventive behaviours and a positive mental attitude. Higher rates of healthy lifestyles were observed among individuals whose profiles were characterised by significantly higher extraversion and conscientiousness and lower neuroticism, compared to the third, least pro-healthy profile. In addition, what turned out to be an important, health-promoting dimension (profile 3), was openness to experience, which was almost one and a half times greater than in profile 1 and profile 2. The results obtained correspond to data available in the literature, indicating the role of combinations of Big Five personality dimensions in the presentation of various behaviours, as well as the formation of disorders such as narcissistic personality, obsessive-compulsive personality or antisocial behavioural disorders (Zawadzki et al, 1998; after Ogińska-Bulik and Juczyński, 2008, p. 106). The results of our own research confirm the unfavourable significance of high neuroticism and low conscientiousness for

health and health behaviours accentuated in the literature of the combination. In our own research, the agreeableness dimension did not emerge, the low intensity of which (as shown in Zawadzki's cited research) does not seem to be conducive to health-oriented approach.

## Conclusion

Although there have been identified certain personality traits that were conducive to health behaviours in men engaged in recreational sport participating in the study, it is worth remembering that the search for such relationships is not easy, due to the complexity of both the subject of personality, health behaviours and their mutual influence. Practising sport also influences the development of a person's personality, and has the potential to support the shaping of a specific axiological backbone from an early age, with particular development of values such as respect for one's personal dignity or solidarity understood as a particular type of interpersonal bond (Czechowski, 2013, pp. 24-27). In addition, the intentional struggle with difficulties during exercise (physical and psychological burdens, thermal discomfort, fatigue, pain), fosters increased motivation for further improvement (Błajet, 2014).

Finally, the impossibility to generalise the results obtained should be clearly emphasised. Methodological reliability requires emphasising important limitations also resulting from the way the sample was selected, therefore, in the analysis, the authors clearly tried to refer only to the studied sample. It is justifiable to plan further research to explore the topic and to search for other factors which may be conducive to having a healthy lifestyle, both among men and women undertaking physical activity in the form of sport or recreation. The application value of the analyses could be the development of more effective methods of health education and prevention, tailored to the individual needs of the recipients of the message.

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