HÁBITOS COMPORTAMENTAIS DE DOENÇA CARDIOVASCULAR EM PENSIONISTAS DE VÁRIOS PERFIS PROFISSIONAIS**BEHAVIORAL BACKGROUND OF CARDIOVASCULAR DISEASE IN PENSIONERS OF VARIOUS PROFESSIONAL TYPES****ПОВЕДЕНЧЕСКИЕ ПРЕДПОСЫЛКИ СЕРДЕЧНО-СОСУДИСТЫХ ЗАБОЛЕВАНИЙ У ПЕНСИОНЕРОВ РАЗЛИЧНЫХ ПРОФЕССИОНАЛЬНЫХ ТИПОВ**BEREZINA, Tatiana N.^{1*}; CHUMAKOVA, Elizaveta²¹Department of Scientific Basis of Extreme Psychology, Moscow State University of Psychology and Education, 2A/1 Shelepkhinskaya Naberezhnaya, Office 207, Moscow 123290. Russia.²State Budgetary Institution of Healthcare City Polyclinic No. 9 of the Moscow City Health Department. Russia.

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RESUMO

O objetivo do estudo foi examinar a influência dos padrões de comportamento no desenvolvimento de doenças cardiovasculares em diferentes perfis profissionais de pessoas em idade de aposentadoria. Métodos: a base clínica de 500 pensionistas (111 homens e 389 mulheres) ligados a uma das clínicas de Moscou foi usada no estudo. Os documentos médicos foram analisados, a avaliação de especialistas foi realizada, a experiência de vida foi pesquisada e as características comportamentais foram autoavaliadas. A gravidade das doenças cardiovasculares foi tomada como uma variável independente e os perfis profissionais foram utilizados como variáveis adicionais, como segue: perfil realista, perfil convencional e perfil social. Padrões de comportamento foram sendo utilizados como variáveis dependentes. A análise de variância (ANOVA) (um fator e dois fatores) foi usada como método de processamento dos dados. Resultados: maus hábitos (alcoolismo, tabagismo, supernutrição), e agressividade aumentam a gravidade das doenças cardiovasculares entre os aposentados, enquanto a existência de *hobbies* e otimismo diminuem. Nos pensionistas de perfil Realista, os *hobbies* esportivos aumentaram o risco, mas os passa tempos e o bordado diminuíram. Nos aposentados de perfil Social, os hobbies esportivos reduziram ainda mais o risco. Nos aposentados do tipo Convencional, a atividade profissional reduziu o risco, enquanto a presença de uma família, filhos, comunicação e vários hobbies a aumentaram. A supernutrição e a agressividade não produziram um efeito adverso significativo. Conclusão: juntamente com os pré-requisitos comportamentais gerais para a ocorrência de doenças cardiovasculares, os indivíduos dependem do perfil profissional da pessoa. Pesquisas adicionais são necessárias para refinar esses resultados.

Palavras-chave: *hábitos comportamentais, hobbies comportamentais, idade da aposentadoria, doenças cardiovasculares, tipos profissionais.*

ABSTRACT

The study has been aimed at examining the influence of behavior patterns on the development of cardiovascular diseases in different professional types of retirement-age people. Methods: the clinical base of 500 pensioners (111 men and 389 women) attached to one of the Moscow clinics has been used in the study. Medical documents have been analyzed, the expert assessment has been carried out, the life experience has been surveyed, and behavioral features have been self-assessed. The severity of cardiovascular diseases has been taken as an independent variable, and the professional types have been used as the additional variables as follows: Realistic type, Conventional type, and Social type. Behavior patterns have been used as the dependent variables. Analysis of variance (ANOVA) (one-factor and two-factor) has been used as the data processing method. Results: bad habits (alcoholism, tobacco smoking, overnutrition), aggressiveness increase the severity of cardiovascular diseases among pensioners, whereas the existence of subject hobbies and optimism reduce it. In the pensioners of the Realistic type, sports hobbies have increased the risk, but subject hobbies and needlework reduced it. In the pensioners of the Social type, sports hobbies have further reduced the risk. In the

pensioners of the Conventional type, the professional activity has reduced the risk, whereas the presence of a family, children, communication, and various hobbies have increased it. Overnutrition and aggressiveness have not produced a significant adverse effect. Conclusion: along with general behavioral prerequisites for the occurrence of cardiovascular diseases, individual ones are depending on the person's professional type. Additional research is needed to refine these results.

Keywords: *behavioral habits, behavioral hobbies, retirement age, cardiovascular disease, professional types.*

АННОТАЦИЯ

Цель исследования – изучить, как влияют особенности поведения на развитие сердечно-сосудистых заболеваний у разных профессиональных типов людей пенсионного возраста. Метод: мы использовали клиническую базу пенсионеров, прикрепленных к одной из московских поликлиник – 500 человек (111 мужчин и 389 женщин). Проводился анализ медицинских документов, экспертная оценка, анкетирование жизненного пути и самооценка особенностей поведения. В качестве независимой переменной мы взяли степень сердечно-сосудистых заболеваний, дополнительными переменными являлись: профессиональные типы: Realistic type, Conventional type, Social type. Зависимыми переменными являлись: особенности поведения. Метод обработки данных – дисперсионный анализ ANOVA (однофакторный и двухфакторный). Результаты: степень сердечно-сосудистых заболеваний у пенсионеров увеличивают: вредные привычки (алкоголизм, табакокурение, переедание), агрессивность; снижают: наличие предметных увлечений и оптимизм. У пенсионеров Realistic type усиливали риск: спортивные хобби, а снижали риск предметных хобби и рукоделие. У пенсионеров Social type дополнительно снижало риск наличие спортивных хобби. У пенсионеров – Conventional type снижала риск профессиональная активность, наличие семьи, детей, общения, наличие различных хобби усиливали риск, а переедание и агрессивность не оказывали значимого негативного эффекта. Выводы: наряду с общими, существует индивидуальные поведенческие предпосылки к возникновению сердечно-сосудистых заболеваний, зависящие от профессионального типа человека. Для уточнения этих результатов необходимы дополнительные исследования.

Ключевые слова: *поведенческие привычки, поведенческие хобби, пенсионный возраст, сердечно-сосудистые заболевания, профессиональные типы.*

1. INTRODUCTION

There are behavioral traits that affect the life expectancy of all people and the development of cardiovascular diseases in them (Berezina and Mansurov, 2015). Such bad habits include alcoholism, tobacco smoking, and overnutrition. The negative effect of bad habits is manifested in all people, regardless of their psychological type or age. At the young age, the risk factors for cardiovascular diseases include excessive weight (20.06 % of cases), tobacco smoking (35.1 % of cases); the adaptive potential of the circulatory system in people with nicotine addiction and those with the excessive weight is significantly lower, systolic hypertension occurs significantly more often (1.5 times), as well as diastolic hypertension (3.1 times) (Ponomareva and Moskalenko, 2016). In the old age, bad habits lead not only to the development of coronary heart disease but also to increase the mortality of heart disease sufferers (Robert *et al.*, 2005).

There are also typological features affecting the development of the cardiovascular disease. Behavioral types with an increased risk of heart disease were identified. The study of M.

Friedman and R. Rosenman is the most famous in this area (Friedman and Rosenman, 1974). Two types of behavior were distinguished in the study: type A – "fight-or-flight" and type B – "hiding". At the same time, the predominance of type A behavior in human life correlates with the risk of cardiovascular disease. Empirical studies confirmed this pattern. In the study, including more than 3,000 people, the authors described the results of an eight-year longitude according to which there were two times more cases of coronary heart disease among the men with the type A personality (Friedman and Rosenman, 1974). In women, type A behavior also contributed to the development of coronary heart disease (Haynes, 1990).

Type A behavior is characteristic of people with the professional Enterprising type, according to John Holland (1973). Such people are set up for competition and success; they feel shortage of time, it is difficult for them to relax, and they become impatient and angry when faced with time delays or with people they consider incompetent. They seem confident, but they are constantly tormented by the feeling of insecurity; they force themselves to do more in less time (Barefoot *et al.*,

1989). It is also known that the psychological traits of a type A patient influence the efficiency of hypertension treatment for some groups of patients (Chumakova *et al.*, 2014).

However, there is no unequivocal evidence of the connection between professional Enterprising type and cardiovascular diseases. Other authors claimed that the features of the emotional sphere rather than the style of professional activity had an influence on the risk of cardiovascular diseases (Spielberger *et al.*, 1985). Moreover, the main factor in the development of cardiovascular diseases was the emotions associated with hostility but not those associated with competition (anger, irritation) (Keith *et al.*, 2017). For example, the 25-year study of 118 male lawyers revealed that those who were more hostile in a law school as per personal questionnaire were more likely to die before the age of 50 years from heart disease than their less-so-hostile fellow students (Barefoot *et al.*, 1989).

Later, another behavioral type – "distressed personality" (D) – was distinguished, which was characterized by a constant intense experience of negative emotions and a tendency to hide them from others because of the fear of being rejected. The representatives of this type are bad-tempered and moody, their attitude to themselves and the world is characterized by constant negativity, they are unable to cope with their negative emotions and cannot share them with other people, which is also considered as a pathogenic factor in the development of cardiovascular diseases (Staniute *et al.*, 2015). It can be noticed that the personal characteristics of such people are opposite to the professional Artistic type according to the John Holland's typology. The representatives of the Artistic type, on the contrary, tend to show their feelings to the whole world. It can be assumed that the risk of cardiovascular disease will be reduced in this type opposite to the "distressed personality" type.

For some other behavioral characteristics, different authors obtained different data. This applies, for example, too optimistic or pessimistic behavior, as well as lifestyle (lonely or with a wide social circle). Some researchers have noted the positive effect of optimism and a wide social circle on the functioning of the cardiovascular system. Researchers at Harvard University demonstrated a positive effect of optimism (Kim *et al.*, 2017). They studied the health data of more than 70 thousand American women of middle and old age that had been obtained as part of mass monitoring among nurses. The researchers found that the most optimistic women had died, on average, 30

% less than their peers and colleagues in a depressed spirit. Also, cancer appeared in them less than usual by 16 %, heart disease – by 38 %, stroke – by 39 %, lung disease, and infection – by 38 % and 52 %, respectively (Kim *et al.*, 2017). There is also evidence of the positive effect of a sense of humor on human health. The 15-year study of life, carried out by Norwegian researchers on 53 thousand participants, showed that the sense of humor was positively related to life expectancy, reduced the risk of death from cardiovascular and infectious diseases in women and the risk of death from infectious diseases in men (Romundstad *et al.*, 2016). Most authors also consider the person's sociability and their wide social circle to be a positive resource. As noted by American researchers, life expectancy is positively related to the frequency of socialization with neighbors, religious participation, and proposal (Cornwell *et al.*, 2008).

Other authors, on the contrary, claim the positive effect of pessimism and a lonely lifestyle. For example, the author of the monumental "The Longevity Project" Lewis Terman and his students, is based on the longitude study that had lasted more than half a century, argued that the pessimism was the key to longevity, whereas the premature death, including that from cardiovascular diseases, was more likely in particularly cheerful and humorous project participants with a wide social circle (Friedman and Martin, 2012). According to their data, hunks and skeptics are more likely to reach older age, since an optimistic view of life often leads to arrogance; optimists lose their sense of prudence: they like to drink, smoke and do not care at all about a healthy diet, and rarely visit doctors (Friedman and Martin, 2012). It turns out that optimists, especially elderly ones, harder bear their misfortune when their optimistic predictions about health turn out to be false. The results of an empirical study of the health status of optimists and pessimists showed that repeated unsatisfied health expectations could undermine motivational resources and accelerate the deterioration of physical condition at the end of life (Hamm *et al.*, 2017).

The authors believe that some of the contradictions of the literature data can be explained by the typological features of a person. Different behavioral factors are favorable for different types of people. In other words, in different types of people, different behavioral patterns can have an effect on the progression of cardiovascular diseases. Professional types are the most important types of mediating the action of

behavioral factors.

The **aim** of the study was the examination of behavioral patterns of different professional types of people (according to Holland's typology), having an effect on the progression of cardiovascular diseases in old age.

Hypothesis. The authors have hypothesized that in people engaged in various professional activities during life, various behavioral patterns (hobbies, life path features, attitude to life, and other people) will have an effect on the progression of cardiovascular diseases at the old age. Some behavioral features will be favorable for the specific type of people since they reduce the risk of the disease. Others will be unfavorable for this type and will increase the likelihood of the development of the diseases.

2. MATERIALS AND METHODS

Methods.

1. Analysis of documents. Examination of medical records, medical books, and health certificates. Gender, age, health indicators, and diagnosis were determined based on this.

2. An expert assessment of the severity of diseases by a geriatrician based on clinical trials and data from a medical examination carried out by four experts – neurologist, ophthalmologist, cardiologist, and pulmonologist.

Three levels of severity were distinguished for cardiovascular diseases, as follows: first – low, certain symptoms of cardiovascular pathology were recorded, second – medium, with the history of acute micro-impairments of cerebral or cardiac circulation (first – the second degree of severity), and third – high, cerebrovascular or circulatory disorders of third-degree of severity, third functional class effort angina.

3. Life experience survey. Original development. The subjects were asked to name their profession, level of career achievements, the presence of family and children, religiosity, and to list their interests and hobbies that had taken place throughout life and were preserved. Further, the number of interests and hobbies was calculated in the intellectual, creative, sports, and subject (needlework, hand-made) groups.

4. The Dembo-Rubinstein method of self-assessment of personality characteristics as modified by the authors. The subjects were asked to evaluate personality characteristics, such as activity, aggressiveness, sociability, optimism, and

carefulness (the presence of an object of care). The development of these indicators during life and at the moment was assessed. Subsequently, self-assessment of indicators was reduced to three levels: low, medium, and high.

5. Mathematical statistics methods. One-factor and two-factor Anova (Statistika-12) was used. The severity of cardiovascular disease served as an independent variable. The dependent variables included personality traits and the life paths thereof, namely education, the existence of a family, children, religiosity, number of relocations, continued work at the retirement age, occupation types according to John Holland (Realistic type, Investigative type, Artistic type, Social type, Enterprising type, Conventional type) (Holland, 1973), level of career achievements, bad habits (tobacco smoking, alcoholism, overnutrition), self-assessment of personality characteristics, namely the activity, sociability, optimism, aggressiveness, and carefulness.

6. The professional type served as an additional variable in the two-factor analysis.

Subjects. Five hundred retirement-age people, of which 111 men over 60 years of age and 389 women over 55 years of age, all were residents of Moscow, attached to the city polyclinic of the southeastern district and regularly visiting a doctor at least once every two months; 456 subjects were in the medical follow-up due to cardiac disease, and four were not followed-up.

Table 1 presents a detailed gender and age composition of the sample.

3. RESULTS AND DISCUSSION

At the first stage, the authors studied how the behavioral characteristics of Russian pensioners influenced the development of cardiovascular diseases in the entire sample. The results are shown in Table 2.

As it follows from the table, all bad habits (alcoholism, tobacco smoking, overnutrition) significantly increase the severity of the cardiovascular diseases at the retirement age, and aggressiveness significantly reduces optimism.

In the second stage, the authors studied the influence of professional types on the progression of cardiovascular diseases (Table 3).

In the third stage, the authors studied the influence of the person's behavioral characteristics on the progression of cardiovascular diseases in the most numerous professional types of the

sample (Realistic type, Social type, and Conventional type).

Realistic type. The representatives of this type have higher severity of the cardiovascular disease than all others ($F(1.494) = 6.7262$, $p = 0.00978$).

For the representatives of this type, the authors discovered several additional behavioral patterns. Firstly, it is favorable for them to have substantive hobbies, both during life ($F(2.494) = 5.4519$, $p = 0.00455$) and at the retirement age ($F(2.494) = 5.0469$, $p = 0.00676$). Secondly, the presence of sports hobbies is not favorable for them (at the trend level $F(4.490) = 2.2382$, $p = 0.06390$). See details in Tables 4, 5, and 6.

As it follows from the table, the representatives of the Realistic type with no subject hobbies have the highest severity of cardiovascular diseases. The presence of subject hobbies reduces the severity of the diseases in the representatives of this type (in the table, these are groups 4, 6). For the other types, the presence of subject hobbies is favorable only in relation to the representatives of the Realistic type with no subject hobbies.

As it follows from the table, the same pattern is preserved. The highest severity of cardiovascular disorders was observed in the representatives of the Realistic type with no subject hobbies. The presence of subject hobbies in the representatives of the Realistic type (group 3) significantly reduces the severity of the cardiovascular disorders both in relation to other professional types having such hobbies (group 3) and in relation to their own type with no such hobbies (group 2).

As it follows from the table, the representatives of the Realistic type with many sports hobbies have the highest level of cardiovascular disorders (group 8). It is significantly higher than in many other groups. Also, the presence of sports hobbies significantly increases the severity of cardiovascular disorders in the representatives of the Realistic type (group 6) in relation to other professional types (group 5).

Social type. For the representatives of this type, the authors discovered several additional behavioral patterns.

Firstly, it is the link to sex. It is favorable for men to have a profession of the Social type since it reduces the severity of the cardiovascular disorders ($F(1.496) = 4.7774$, $p = 0.02930$). Secondly, for all representatives of the Social type, it is favorable to have sports hobbies throughout

life ($(4.490) = 2.6221$, $p = 0.03422$), and at the retirement age, completeness persists only as a trend. Thirdly, the availability of subject hobbies is not favorable for them at the trend level both during life ($F(2.494) = 2.5215$, $p = 0.08137$) and at the retirement age ($F(1.495) = 3.3266$, $p = 0.06877$). Reliable patterns are presented in Tables 7 and 8.

As it follows from the table, the highest severity of cardiovascular disorders is observed in the men working in other areas (non-Social type) – group 3. In the men of the Social type, the severity of cardiovascular disorders does not differ from that in the women.

As it follows from the table, the representatives of the Social type with one sports hobby (group 4) have lower severity of the cardiovascular disorders than all other groups. It is significantly lower than that of the representatives of other professional types (groups 3 and 6).

Conventional type. For the representatives of the Conventional type, the greatest number of patterns was found.

Firstly, for the representatives of the Conventional type, correlation with age is evident. In some age groups, they have lower severity of the cardiovascular disorders ($F(3.492) = 2.7456$, $p = 0.04249$).

Secondly, the existence of a family ($F(2.494) = 4.4053$, $p = 0.01270$), children ($F(1.496) = 5.1180$, $p = 0.02411$), a high level sociability throughout life ($F(2.494) = 8.9792$, $p = 0.00015$) and at the retirement age ($F(2.494) = 6.8030$, $p = 0.00122$) are favorable for the representatives of the Conventional type.

Thirdly, the presence of a variety of hobbies for this type does not have a positive effect. The presence of a large number of intellectual hobbies increases the severity of cardiovascular diseases ($F(3.492) = 2.8606$, $p = 0.03646$). The presence of creative hobbies increases the severity of cardiovascular diseases at the trend level ($F(1.495) = 3.5924$, $p = 0.05863$). In the representatives of this type, the presence of sports hobbies increases the severity of cardiovascular disorders compared to those without sports hobbies ($F(3.491) = 3.7472$, $p = 0.01106$).

Fourthly, some behavioral characteristics harmful to all people are less harmful to the representatives of the Conventional type. For them, the average severity of overnutrition at the retirement age does not have a harmful effect ($F(2.493) = 3.4019$, $p = 0.03409$). Also, a high level

of aggressiveness does not have a harmful effect ($F(2.494) = 3.3022$, $p = 0.03762$) for them.

The most significant differences are shown in Table 9.

As it follows from the table, social characteristics are favorable for the representatives of the Conventional type. The existence of a family, children, and social circle reduces the severity of cardiovascular disorders in the representatives of this type. Also, at the age of 75 – 85 years, cardiovascular diseases are less pronounced in the representatives of this type. A variety of hobbies does not have a positive effect on this type. The presence of intellectual, sports, and creative hobbies does not reduce the severity of cardiovascular disorders. At the same time, some harmful behavioral characteristics (overnutrition, aggressive behavior) do not increase the severity of cardiovascular diseases in the representatives of this type.

In the study, the representatives of the Realistic type, which included all working and technical specialties, turned out to be the most vulnerable to the development of cardiac pathology. In general, both negative professional factors described in the literature affected this group, namely, the work stress associated with increased requirements for work and low ability to influence something, and the imbalance between efforts and rewards. The first one is the demand-control working stress model (by R. Karasek), where the work, which requires great diligence, is the most unfavorable for the cardiovascular system, and at the same time, it has a low decision-making level (Karasek *et al.*, 1998). This applies specifically to the representatives of the Realistic type. This model is supported by the results of the longitudinal study, in which 1,928 working men had been observed for six years, where for the workers performing an unfavorable type of work, the risk of coronary death was six times higher than for the rest (Ushakov *et al.*, 2016).

The second is the effort-reward imbalance model (by J. Siegrist), where the work that requires greater returns and does not give a decent reward is the most dangerous for the development of cardiovascular diseases and atherosclerosis (Siegrist *et al.*, 2004). In summary, the authors emphasize the importance of chronic occupational stress as a factor affecting the development and course of cardiovascular diseases (Gilbert-Quimet *et al.*, 2014), especially if the work is not accompanied by career growth (Berezina and Mansurov, 2015). The professionals related to the

representatives of the Realistic type in the study were also subjected to this type of stress.

However, this study was able to find resource areas that could help the representatives of the Realistic type to reduce the risk of cardiovascular disease. Needlework is positive for this type. Therefore, the psychologists involved in the rehabilitation of retirement-age heart disease sufferers, in this case, recommend developing a person's interests and subject hobbies as a self-help measure. Sports, intellectual and creative hobbies are not associated with the risk of cardiovascular diseases in the representatives of this type. This is mainly because these are mostly the people involved in physical labor, and the positive effect of physical exercises is implemented through labor, and intellectual and creative hobbies are simply expendable.

However, for the representatives of the Social type, which include the representatives of the service sector, teachers, medical workers, a completely different scenario is observed. General psychological patterns (needlework and the development of optimism as the factors reducing the risk of cardiovascular diseases) do not work for them, and it is unlikely that the psychological rehabilitation in this direction will be favorable. However, it should be noted that the level of optimism among employees has been quite high and even slightly above the average for the sample, and it is possible that the positive strength in the representatives of this type has already been involved and an additional increase in optimism would not add anything. To reduce the risk of cardiovascular disease development among the retirees of this group (often leading a sedentary life), it is recommended to practice gymnastics and develop sports hobbies.

For the representatives of the Conventional type, the physical health of a person does not depend on whether he/she is engaged in any hobby or not. For the psychological rehabilitation of workers in this area, it may be effective to turn to their professional activities: continuing to work at the retirement age, acting as an expert or mentor, etc. For the representatives of this type, the resource area is the social one, namely the extension of social circle, increasing the time spent with family and children. In the literature, the presence of kinship at the retirement age is a traditionally favorable factor that reduces the risk of diseases and increases life expectancy (Cornwell *et al.*, 2008). Loneliness is a negative factor since people living alone are less likely to care about their health, and as a result, have a greater risk of developing cardiovascular diseases

and premature death (Jain *et al.*, 2017). The authors have shown that this is true for at least one of the professional types.

4. CONCLUSION

Behavioral factors influence the onset, development, and severity of cardiovascular diseases at the retirement age. Thus, the person's bad habits (alcoholism, smoking, overnutrition), aggressiveness as a personality trait, and a profession related to the Realistic type worsen prognosis, and optimism and the presence of subject hobbies improve it.

Additional positive and negative factors have been discovered for various professional types. In the pensioners of the Realistic type, needlework has a positive effect on the development of substantive interests and hobbies. For the pensioners of the Social type, physical education, sports, and physical activity have a positive effect, whereas optimism and needlework have no effect. For the pensioners who worked with documents – office workers (Conventional type) – engaging in any hobby has no effect, and professional activity and social activity have a positive effect.

5. AUTHOR CONTRIBUTIONS:

Conceptualization, BTN.; Methodology, BTN., CE.; Validation, CE.; Resources, BTN, CE.; Writing-Original Draft Preparation BTN.; Writing-Review & Editing, BTN.; Visualization, BTN.; Supervision, BTN.; Project Administration, BTN.

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Table 1. Gender and age composition of the sample

Sex	Age groups (number of people)			
	First group 55-65 years old	Second group 66-75 years old	Third group 76- 85 years old	Fourth group 86 years old and older
all	187	191	109	13
Men	34	52	23	2
Women	153	139	86	11

Table 2. Features of the personal organization of life path time influencing the severity of the cardiovascular diseases

The severity of disease at different levels of behavioral indicator				Influence	F	p
Indicator	Indicator levels					
	1	2	3			
Tobacco smoking	1.89	2.18	2.10	increases	F(2.497) = 5.60	p = 0.003
Alcoholism	1.87	2.20	2.25	increases	F(2.497) = 5.60	p = 0.004
Overnutrition	1.89	2.08	2.12	increases	F(2.497) = 5.14	p = 0.006
Alcoholism at the moment	1.93	2.18	2.0	increases	F(2.497) = 4.4518	p = 0.012
Aggressiveness	1.92	1.93	2.15	increases	F(2.497) = 3.33	p = 0.037
Aggressiveness at the moment	1.89	1.95	2.19	increases	F(2.497) = 3.99	p = 0.019
Optimism at the moment	2.22	1.95	1.92	decreases	F(2.497) = 3.25	p = 0.039

1. The severity of the cardiovascular disease in the patients with low behavioral indicator (arithmetic mean of the severity of the disease).

2. The severity of the cardiovascular disease in the patients with medium behavioral indicator (arithmetic mean of the severity of the disease).

3. The severity of the cardiovascular disease in the patients with high behavioral indicator (arithmetic mean of the severity of the disease).

Table 3. The influence of the professional type on the progression of cardiovascular diseases ($F(5.494) = 8.3543$, $p = 0.00000$)

No.	Professional types	Number of persons	Severity of the disease (arithmetic mean)	Standard deviation
1	Realistic type	156	2.108974 ^{2, 4, 6}	0.050506
2	Investigative type	4	0.250000 ^{1, 3, 4, 5, 6}	0.315409
3	Artistic type	9	1.777778 ²	0.210272
4	Social type	155	1.922581 ^{1, 2}	0.050668
5	Enterprising type	5	1.600000 ²	0.282110
6	Conventional type	171	1.918129 ^{1, 2}	0.048240

¹– the reliable difference with the Fisher's type 1 ($p \leq 0.05$)

²– the reliable difference with the Fisher's type 2 ($p \leq 0.05$)

³– the reliable difference with the Fisher's type 3 ($p \leq 0.05$)

⁴– the reliable difference with the Fisher's type 4 ($p \leq 0.05$)

⁵– the reliable difference with the Fisher's type 5 ($p \leq 0.05$)

⁶– the reliable difference with the Fisher's type 6 ($p \leq 0.05$)

Table 4. The severity of the cardiovascular disorders in the representatives of the Realistic type, with and without subject hobbies throughout life

Group No.	Number of subject hobbies throughout life	Professional types	Severity of the cardiovascular disorders (arithmetic mean)	Standard deviation	Number of persons
1	0	1	1.864322 ²	0.045421	199
2	0	2	2.200000 ^{1, 3, 4, 5, 6}	0.058491	120
3	1	1	1.953846 ²	0.056196	130
4	1	2	1.793103 ²	0.118982	29
5	2	1	1.733333 ²	0.165438	15
6	2	2	1.857143 ²	0.242176	7

^{1, 2, 3, 4, 5, 6} – the significant difference with the relevant Fisher group ($p \leq 0.05$)

Professional types:

1- all other types

2- Realistic type

Table 5. The severity of the cardiovascular disorders in the representatives of the Realistic type, with and without subject hobbies at the retirement age

Group No.	Number of subject hobbies throughout life	Professional types	Severity of cardiovascular disorders (arithmetic mean)	Standard deviation	Number of persons
1	0	1	1.895833 ²	0.037735	288
2	0	2	2.157534 ¹	0.052998	146
3	1	1	1.872727 ^{2, 3}	0.086349	55
4	1	2	1.444444 ^{1, 3}	0.213460	9
5	2	1	2.000000	0.640380	1
6	2	2	1.000000	0.640380	1

^{1, 2, 4} – the significant difference with the relevant Fisher group (with $p \leq 0.05$)

Professional types:

1– all other types

2– Realistic type

Table 6. The severity of the cardiovascular disorders in the representatives of the Realistic type, with sports hobbies and without them throughout life

Group No.	Number of sports hobbies throughout life	Professional types	Severity of the cardiovascular disorders (arithmetic mean)	Standard deviation	Number of persons
1	0	1	1.866667 ^{6, 8}	0.058868	120
2	0	2	2.023256 ⁸	0.098341	43
3	1	1	1.929293 ^{6, 8}	0.064811	99
4	1	2	2.062500 ^{7, 8}	0.093078	48
5	2	1	1.911765 ^{6, 8}	0.063851	102
6	2	2	2.148148 ^{1, 3, 5}	0.087755	54
7	3	1	1.727273 ⁴	0.137486	22
8	3	2	2.555556 ^{1, 2, 3, 4, 5}	0.214955	9
9	4	1	3.000000	0.644866	1
10	4	2	2.000000	0.455989	2

1, 2, 3, 4, 5, 6, 8 – significant difference with the relevant Fisher group ($p \leq 0.05$)

Professional types:

1– all other types

2– Realistic type

Table 7. The severity of the cardiovascular disorders in the male and female representatives of the Social type

Group No.	Sex	Professional types	Severity of the cardiovascular disorders (arithmetic mean)	Standard deviation	Number of persons
1	female	1	1.848980 ³	0.040475	245
2	female	2	1.923077 ³	0.052978	143
3	male	1	2.290000 ^{1, 2}	0.063353	100
4	male	2	1.916667	0.182883	12

1, 2, 3, – significant difference with the relevant Fisher group (with $p \leq 0.05$)

Professional types: 1– all other types. 2– Social type

Table 8. The severity of the cardiovascular disorders in the representatives of the Social type, with and without sports hobbies throughout life

Group No.	Number of sports hobbies throughout life	Professional types	Severity of the cardiovascular disorders (arithmetic mean)	Standard deviation	Number of persons
1	0	1	1.842593 ^{3, 5}	0.062606	108
2	0	2	2.036364	0.087730	55
3	1	1	2.049505 ^{1, 4}	0.064739	101
4	1	2	1.804348 ^{3, 5}	0.095929	46
5	2	1	2.035714 ^{1, 4}	0.061478	112
6	2	2	1.886364	0.098085	44
7	3	1	2.000000	0.138713	22
8	3	2	1.888889	0.216874	9
9	4	1	2.000000	0.460059	2
10	4	2	3.000000	0.650621	1

1, 3, 4, 5, – significant difference with the relevant Fisher group ($p \leq 0.05$)

Professional types: 1– all other types. 2– Social type

Table 9. The severity of the cardiovascular disorders in the representatives of the Conventional type and other professional types in the presence of various behavioral characteristics

Indicators	Indicator levels	Severity of the disease		Effect
		Other professional types	Conventional type	
Age group	55 – 65 years of age	1.836207	1.985507	0.130755
	66 – 75 years of age	2.076336	1.950820	0.212589
	76 – 85 years of age	2.027397	1.729730*	0.023426
Family	Absent	0.500000	2.000000*	0.011550
	Short marriage	1.931034	2.032258	0.483059
	Permanent marriage	2.003717	1.890511	0.096748
Children	Absence	1.687500	2.222222*	0.049352
	Presence	1.996805	1.901235	0.130142
Sociability in life	Low	0.000000	3.000000*	0.000147
	Medium	1.927273	1.982456	0.597651
	High	2.027650	1.876106*	0.041849
Sociability at the retirement age	Low	0.000000	2.33333*	0.001899
	Medium	1.941176	2.000000	0.544867
	High	2.020833	1.852941*	0.034733
Overnutrition	Low	1.914798	1.933824	0.767105
	Medium	2.120000	1.823529*	0.043176
Aggressiveness at the retirement age	Low	1.837209	2.086957	0.100525
	Medium	2.020833	1.852941*	0.024969
Intellectual hobbies in life	Absent	2.065934	1.800000*	0.040487
	High level	1.647059	2.166667*	0.034735
Creative hobbies in life	Absent	2.038298	1.886179*	0.035511
	Medium level	1.890244	2.000000	0.352054
	High level	1.500000	–	
Sports hobbies in life	Absent	2.019417	1.716667	0.004269
	Low level	1.927083	2.058824	0.242205
	High Level	1.880000	2.333333	0.125241

– there were no subjects with this indicator level.

* –The difference is significant between the representatives of the Conventional type and other professional types.