Psychological factors of biopsychological age of law enforcement personnel

Anna Koteneva[*]

Abstract: The article presents the results of a study of psychological resources of law enforcement personnel and their relationship with biopsychological age indicators. The sample involved 121 people, 77 males and 44 females. The average age of specialists was 31 years, the average length of service – 9 years. Research methods of bio-psycho-social aspects developed by A.V. Makhnach, K.A. Abulkhanova and T.N. Berezina were used. Methods of mathematical statistics such as T-criterion for independent samples and correlation analysis were used for data processing. The results of the study show that men differ from women according to a number of indicators: they have lower indicators of all components of resilience, an accelerated rate of biological aging, but psychologically they feel younger than women. The biological age of law enforcement personnel reduces self-efficacy, perseverance, internal locus of control, constructive coping strategies and family support. Spirituality slows down the rate of biological aging. Psychological age and psychobiological age maturity also increase as resources such as self-efficacy, internal locus of control, and resilience.

Keywords: biological age, coping, family resources, locus of control, persistence, psychological age, psychobiological maturity, self-efficacy, spirituality

INTRODUCTION

Professional activity of law enforcement personnel is related to numerous risks and extreme factors that cause a threat to their health and life. Long-term excessive stress in extreme conditions of activity causes a decrease in work productivity, efficiency and emotional burnout. Therefore, it is relevant to study psychological resources of law enforcement personnel, which help to cope with stressful situations and maintain health.

[*] Anna Koteneva (✉)
Moscow State University of Psychology & Education, Moscow, Russia
e-mail: akoteneva@yandex.ru

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Currently, in medicine, the biological age of a person is an objective criterion for assessing his/her health. The concept of "biological age", or "age of development", means the degree of morphological and physiological development of the organism. The calendar age may differ from the biological age, and differences between them allow us to assess the intensity of aging and functional capabilities (Cole, Marioni, Harris & Deary 2019; Han et al. 2019) of a specialist at different stages of life and professional development, the state of his/her psychophysical health and working capacity. Subjective (psychological) age also predicts a person's psychological, mental and physical health (Melehin & Sergienko 2015) and is an indicator of his/her self-realization, emotional and physical well-being (Mirucka, Bielecka & Kisielewska 2016). Although biological age is largely determined by a combination of metabolic, structural, functional, regulatory features and adaptive capabilities (Li, Li & Xu 2018; Rentscher et al. 2019), it also depends on environmental conditions and lifestyle. Extreme conditions of activity often cause health disorders, a decrease in the quality of life, an accelerated rate of premature aging, and an increase in the biological age of representatives of dangerous professions (Berezina, Ed., 2019). According to S.G. Abramovich and M.P. Bush (2008), the rate of aging of military personnel was higher than in other professions. L.B. Kim, A.N. Putyatina and P.M. Kozhin (2014, 9) believe that premature aging of mining workers can be considered as a "biosocial payment for adaptation to the harsh natural and climatic conditions of the Arctic zone of the Russian Federation". According to M. Moreno-Villanueva and A. Bürkle (2014), stress, as an adaptive response of the body to extreme situations of vital activity, threatens "successful" aging. If "successful aging" involves maintaining a person's mental, physical and social health, then pathological aging is accompanied by serious diseases such as cancer, memory loss, heart disease or arthritis. As shown in the paper of R.G. Reed (2019), stress is one of the factors that can accelerate immunological aging.

The results of the study by E.S. Epel and A.A. Prather (2018) found that people who experienced chronic stress for a long time were at an increased risk of acquiring specific age-related diseases and had a shorter life expectancy. Therefore, constant professional stress can cause not only emotional burnout, but also premature biological aging of the specialist. In modern psychology, stress tolerance is often considered as a factor contributing to delayed aging. T.D. Cosco and

coauthors (2014) have shown that models of "successful" aging include not only physiological criteria (for example, physical functioning), well-being criteria (for example, life satisfaction), but also the presence of personal resources of individual stress resistance. K.L. Hamilton and B.F. Miller (2016) argue that "successful" aging depends on resistance to specific types of stress. A potential threat to the mental and physical health of a professional can be not only external stressful conditions of life, economic and social factors, but also insufficient psychological resources of stress-overcoming behavior, reduced adaptive abilities and resilience.

In psychology, in the course of studying functional and extreme states, the role of various personal qualities that cause fatigue and burnout of a specialist, as well as those psychological resources that allow him to maintain optimal functioning in stressful situations of professional activity (Koteneva & Kobzarev 2019; Chelyshev & Koteneva 2019; Koteneva et al. 2020), is revealed. Nevertheless, psychological predictors of biological and psychological age have not yet been studied. The identification of these predictors is necessary for the prevention and psychocorrection of negative mental states that cause an accelerated rate of specialists' aging in stressful conditions of activity.

The purpose of the study is to identify the psychological resources of law enforcement personnel that affect their biopsychological age and the rate of aging. Since one of the mechanisms of biological and psychological aging of a person is stress, it can be assumed that people who are able to cope with stress and quickly recover from stressful loads are characterized by either a normal or slow biological aging rate. The person's resilience is an integrative ability to manage his/her psychological resources in stressful situations (Makhnach 2016). The hypothesis of the study is that as the degree of specialists' resilience in general, and individual components in particular (self-efficacy, perseverance, internal locus of control, spirituality, etc.), increase, there is a decrease in biological age and an increase in psychobiological maturity, slowing down the rate of aging.

RESEARCH METHODS

The sample of the empirical study consisted of 121 people – law enforcement personnel (police employees, police drivers, investigators, patrol employees, communications and security employees), 77 of them men and 44 women. The age of specialists ranged from 24 to 54

years (the average age is 31 years), and the average work experience is 9 years. 25.6 % of respondents have secondary and specialized secondary education, and 74.6 % have higher education. 48 % of respondents are married, while 52 % have the status of single men, unmarried women or divorced.

The Questionnaire "Resilience of an adult" by A.V. Makhnach (2016) was used to diagnose the psychological resources of a person in stressful situations. This method allowed us to define a person's resilience as an integrative ability to manage his/her resources in stressful situations in general, and to identify such specific personal resources as self-efficacy, perseverance, internal locus of control, coping strategies, family/social resources and spirituality.

The "Method of psychobiological age research" by K.A. Abulkhanova and T.N. Berezina measures three indicators: determining the biological age by the method of V.P. Voitenko; self-assessment of psychological age by K.A. Abulkhanova and T.N. Berezina. and calculating the psychobiological age index (Berezina, Ed., 2019, 17-18).

The method "Determining biological age" by V.P. Voitenko includes 3 scales: biological age (BA), proper biological age (PBA) and the index of biological aging (BA-PBA). The method consists of a questionnaire "Self-assessment of health" and a formula for determining biological age, which includes indicators of blood pressure, respiratory retention after inspiration, static balancing and body weight. The integral indicator is the indicator of biological age (BA). The proper biological age indicator (PBA) describes the average biological age for a specific age group. The BA-PBA index indicates the rate of biological aging: slow (BA < PBA), normal (BA = PBA), and accelerated (BA > PBA). When assessing the rate of aging, we used the criteria of L.M. Belozerova (2008), according to which the difference between biological and proper age from -15 to - 5 points corresponds to delayed aging; the difference from -4.99 to +4.99 corresponds to normal physiological aging; the difference from +5 to +15 points corresponds to premature aging.

The indicator "Cognitive illusion of age", or the difference between psychological and calendar age, reflects the rate of psychological aging and the adequacy of the experience of subjective age. In psychology, the difference between psychological and calendar age is evaluated by different criteria. Some authors believe that the presence of a discrepancy of up to 13 years indicates an optimal cognitive illusion of

age; more than 14 years – the presence of neurotic denial of their own aging; more than 20 years age - disorientation (Melehin & Sergienko 2015). O.Yu. Strizhitskaya (2013) gives other criteria: the difference between the psychological and calendar age of ± 4 years corresponds to an "adequate" experience of age; more than ± 4 - to an inadequate experience of psychological age. The indicator "Psychobiological age maturity", which characterizes the ratio of psychological age to biological age (PAM = PA/BA), allows to determine whether a person is psychologically younger or older than his/her biological age. The PASW Statistics 18 program (descriptive statistics, T-criteria for independent samples, correlation analysis) was used to processing data.

RESULTS

The results of diagnostics of psychological resources and biopsychological age of law enforcement personnel show the following:

Psychological resources for coping with stressful situations of specialists

According to the results of the application of the questionnaire "Resilience of an adult" by A.V. Makhnach, it turned out that all components of employee resilience and its integrative index, although falling within the average range of normative indicators, tend to its lower limit. At the same time, 40.5% of respondents have a low level, 52% have an average level, and 7.6% have a high level of resilience – the integral ability to adapt to stressful and extreme factors of activity.

Biological and psychological characteristics of age

For the whole sample, the biological age (M=44,57; S=8,71[1]) of specialists exceeds the proper biological age (M=37,24; S=4,76) for this age category. Moreover, the average index of biological aging indicates its accelerated rate (M=7,32; S=8,59), which is a threat to human health. The psychological age (M=38,56; S=18,67) exceeds the calendar age (M=31,28; S=18,67); the resulting discrepancy between them indicates an inadequate experience of psychological age both in the sample as a whole, and in men and women in particular (M=7,28; S=7,62). At the same time, psychobiological age maturity is adequate and coincides with age norms (M=,917; S=,561). A comparative

[1] M – means; S - standard deviation.

analysis of all indicators using the T-criteria for independent samples between men and women belonging to this professional group revealed some tendencies and differences.

Psychological resources for coping with stressful situations in men and women

For almost all components of resilience, or the ability to adapt to stressful situations, women show significantly higher indicators than men. In adverse conditions of life, women are more *self-effective* (T= 3,822; p=,000)[2], that is, they are able to mobilize their motivational and cognitive resources to achieve success in professional activities. They are characterized by *perseverance* (T= 2,116; p=,037), namely the desire for purposeful activity, self-discipline necessary to overcome difficulties. Women, in contrast to men, have a more pronounced *internal locus of control* (T= 2,727; p=,007), or the ability to take responsibility for events, control them and find positive solutions. Female employees are also characterized by greater *spirituality* (T= 2,198; p=,031), which is understood by the author's of the questionnaire as a person's desire to find the meaning of life and support in religious faith, as well as to be guided by these spiritual and moral values in their behavior. There are significant differences between men and women according to the indicator *"Family and social relationships"* (T= 2,886; p=,005). The desire to create a family and secure interpersonal relationships is a great psychological resource for women to cope with stress compared to men. The only exception is the "Coping and adaptation" component of resilience (T= 1,837; p=,069). Employees of both sexes equally use constructive emotional, cognitive, and behavioral strategies for coping with stress.

Biological and psychological age characteristics of men and women

The biological age of men is significantly higher than the biological age of women (T= 5,681; p=,000). Moreover, in males, there is an accelerated rate of biological aging (M=9,82; S= 7,21) and in females, the biological age is approximately equal to the proper biological age, that is, it indicates the usual rate of physiological aging (M=2,94; S= 9,14). However, women report significantly more often (almost twice) on violations of somatic health than men. When comparing the difference between psychological and calendar age (the "psychological aging" index), it turned out that men and women assess themselves as

[2] T - T empirical; p – significance level.

being older than they are. Men estimate their subjective age almost "identical" to the calendar age, while women's estimation approaches the neurotic one. Men also have a lower level of psychobiological maturity (M=,75; S=,33) meaning that they feel psychologically younger than their biological age allows. But it is the increased youth that makes them unable to assess the real state of the body. In women, the indicator of psychobiological maturity corresponds to an adequate level (M=1,206; S=,74), which allows them to realistically assess their health status.

The relationship between psychological characteristics and biopsychological age in law enforcement personnel

The results of the correlation analysis turned out that self-assessment of somatic health is not associated with any of the indicators of psychological resources for coping with stressful situations, while biological and proper biological age have significant negative correlations with all components of resilience, with the exception of spirituality. In other words, the higher the employees' self-efficacy (r=-,266; p <0, 01[3]), perseverance (r=-,213; p <0, 01), and internal locus of control (r=-,188; p <0,05), the more often they use constructive cognitive, emotional, and behavioral coping strategies (r=-,217; p <01), seek support in family and interpersonal relationships (r=-,302; p <0,001), and the higher their resilience (r=-,256; p <0,01), the lower their biological and proper biological age. In turn, spirituality and the rate of biological aging are closely linked (r=,161; p <0,05). Finding an existential meaning of life and religious faith, following spiritual and moral values in their behavior slows down the rate of aging. However, the psychological age of the respondent increases with the development of self-efficacy (r=,150; p <0,05), internal locus of control (r=,190; p <0,05), spirituality (r=,187; p <0,05) and resilience (r=,161; p <0,05).

Psychobiological age maturity also increases if people in stressful situations show confidence in themselves, in their capabilities (r=,243; p <0,01), they demonstrate purposeful behavior (perseverance) (r=,156; p <0,05), accept responsibility for events (internal locus of control) (r=,230; p <0,01), are guided by religious faith and values (r=,175; p <0,05), and find support in family and interpersonal relationships (r=,208; p <0,01). However, the presence of such

[3] r – correlation coefficient.

psychological resources (other than spirituality) makes a person psychologically older than his/her calendar age. Calendar, or chronological age and self-efficacy (r=-,164; p <0,05), perseverance (r=-,227; p <0,01), constructive coping strategies (r=-,170; p <0,05), family and social resources (r=-,254; p <0,01) have significant negative associations. The younger the specialist, the more pronounced these components of resilience are.

DISCUSSION

According to L.K.M. Han and coauthors (2019), stress is one of the causes of biological and psychological aging of a person, and the ability of a person to adapt to stress; his/her stress resistance and resilience act as mechanisms for preventing maladaptive reactions. The ability to recover quickly after stressful loads is characterized by either a normal or slow rate of biological aging (Millera & Hamiltona 2017). These mechanisms also explain the impact of chronic, sometimes extreme, stress on both the rate of biological aging of the professional and his resistance resources. Excessive psychoemotional and physical stress can become a source of violation of all types of human health (cellular, metabolic, immune, sensory, psychological, etc.) according to Rentscher et al. 2019, and Hamilton & Miller 2016, as well as depletion of its psychological resources.

Working in law enforcement structure under conditions of increased professional risk and stress, as shown by the results of this study, is associated with a certain decrease in self-efficacy, perseverance, internal locus of control, coping and adaptation to stressful situations, spirituality, family and social relationships. In addition, the biological age of specialists exceeds the appropriate biological age for this age category, and the average index of biological aging indicates its accelerated rate, which is a threat to human health. Activity in conditions of high emotional tension makes a person psychologically older, in some cases leads to a neurotic experience of his/her age, its denial.

The results show gender differences in the use of psychological resources and the rate of biological and psychological aging. Female employees use almost all psychological resources better than male employees. Their biological age is younger, and the rate of aging corresponds to physiological norms. Men have an accelerated rate of aging. Self-assessment of health is included in the indicator of biological age. There is a certain paradox: the biological age of men is

higher, but they ignore the physiological symptoms of health disorders. May this be due to their psychological age? Their subjective psychological age in absolute terms is much younger than that of women. In conditions of chronic stress, the subjective age can change significantly. People who rely more on their own personal resources to overcome stress are more mature, but they also feel older than the calendar age. This is evidenced by the results of correlation analysis. On the one hand, with the development of resilience and its majority of components, the biological age of employees decreases, but, on the other hand, the psychological age increases. Although human spirituality does not directly affect biological age, it slows down the rate of aging. This is possible due to the fact that finding the existential meaning of life, prayer, and Church attendance, according to Z. Zimmer and coauthors (2016), as well as D. Papadopoulos (2020), also increase the overall psychological health of a person. The research hypothesis was generally confirmed.

CONCLUSION

Law enforcement personnel are characterized by a reduced level of resilience and its components (self-efficacy, perseverance, internal locus of control, coping, spirituality, and family relationships). The biological age exceeds the proper biological age, and this category of specialists has premature aging and reduced functional and adaptive capabilities. Although most employees do not adequately experience their psychological age, the indicator of psychobiological age maturity coincides with age norms. Male employees differ from female employees in lower rates of resilience, with the exception of coping behavior. At the same time, men not only have a higher biological age than women, but also have an accelerated rate of biological aging, while female employees have the usual physiological aging of the body. At the same time, women are more realistic about their mental and somatic health than men. Men and women assess themselves older than the calendar age. But if men feel psychologically younger than their biological age allows, women evaluate their psychological age in accordance with age norms.

The psychological resources of law enforcement personnel necessary to cope with stressful situations of professional activity are closely related to biological, psychological age, psychobiological maturity and the rate of aging. Biological age reduces self-efficacy, perseverance, internal locus of control in the employee, constructive

coping strategies and family support. Spirituality slows down the rate of biological aging of a person, but makes a person psychologically older and more personally mature. Psychological age and psychobiological age maturity also increase as resources such as self-efficacy, internal locus of control, and resilience. Developing and implementing trainings for the development of psychological resources for coping with stressful situations of professional activity are the prevention of premature biological and psychological aging of law enforcement personnel.

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