

DĄBEK, Józefa, KULIK, Halina, ZDRZĄLEK, Rafał, STOLORZ, Karolina & SIERKA, Oskar. The penalty of imprisonment and its impact on the health of inmates - preliminary results. *Journal of Education, Health and Sport*. 2023;22(1):11-29. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2023.22.01.001>
<https://apcz.umk.pl/JEHS/article/view/43258>
<https://zenodo.org/record/7848845>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of December 21, 2021. No. 32343. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical Culture Sciences (Field of Medical sciences and health sciences); Health Sciences (Field of Medical Sciences and Health Sciences). Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 21 grudnia 2021 r. Lp. 32343. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przynależność dyscypliny naukowej: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu). © The Authors 2023; This article is published with open access at License Open Journal Systems of Nicolaus Copernicus University in Torun, Poland Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited. The authors declare that there is no conflict of interests regarding the publication of this paper. Received: 18.03.2023. Revised: 27.03.2023. Accepted: 20.04.2023. Published: 20.04.2023.

The penalty of imprisonment and its impact on the health of inmates - preliminary results

Józefa Dąbek¹, Halina Kulik², Rafał Zdrzałek³, Karolina Stolorz⁴, Oskar Sierka⁵

¹Department of Cardiology, Faculty of Health Sciences in Katowice, Medical University of Silesia in Katowice, 40-635 Katowice, 45/47 Ziołowa St., Poland. ORCID: 0000-0002-8257-6614. jdabek@sum.edu.pl.

²Department of Propaedeutics of Nursing, Faculty of Health Sciences in Katowice, Medical University of Silesia in Katowice, 40-027 Katowice, 20/24 Francuska St., Poland. ORCID: 0000-0002-1092-814X. hbkulik@sum.edu.pl.

³Prison Health Service, Correctional Facility in Racibórz, 47-400 Racibórz, 14 Eichendorff's St., Poland. rafal01.79@o2.pl.

⁴Student Research Group at the Department of Cardiology, Faculty of Health Sciences in Katowice, Medical University of Silesia in Katowice, 40-635 Katowice, 45/47 Ziołowa St., Poland. karolinastolorz@gmail.com.

⁵Student Research Group at the Department of Cardiology, Faculty of Health Sciences in Katowice, Medical University of Silesia in Katowice, 40-635 Katowice, 45/47 Ziołowa St., Poland. ORCID: 0000-0001-8667-6463. oskarsierka@gmail.com.

Corresponding author: Oskar Sierka, Student Research Group at the Department of Cardiology, Faculty of Health Sciences in Katowice, Medical University of Silesia in Katowice, Katowice, Poland. oskarsierka@gmail.com. ORCID: 0000-0001-8667-6463.

Abstract

Introduction and purpose

The prison system is an extremely important element of the country's penal structure. Restrictions related to serving a sentence of imprisonment adversely affect the physical health and the mental health of inmates. The main goal of the study was to assess selected areas of health of respondents in prison and changes in them depending on the time spent in prison.

Material and methods

The study included 153 (100%) men aged 18 to 55 staying in the Penitentiary Institution in Racibórz. An original questionnaire consisting of questions concerning the described issues was used to conduct the study. All respondents provided informed consent to participate. Obtained results in each category were converted into 5-point Likert Scale. Statistical analysis was carried out using the Chi² test to investigate the relationship between the obtained results and the time spent in prison.

Results

Almost 30% of respondents declared the presence of chronic diseases before imprisonment, and more than half of the most common ailments after imprisonment included heartburn. Conducted analysis showed that even though more than 60% of the respondents assessed their general health positively there was a significant difference ($\text{Chi}^2=13.8$; $p=0.0083$) between obtained results and inmates' self-assessment. Time spent in prison was not influencing significantly physical health ($\text{Chi}^2=9.9$ $p=0.624$) and inmates' pro-health behaviors ($\text{Chi}^2=18.0$ $p=0.3232$), but it influenced mental health ($\text{Chi}^2=28.3$; $p=0.047$) and lifestyle ($\text{Chi}^2=37.4$; $p=0.0052$).

Conclusion

The conducted evaluation shows how inmates' health and its determinants are changing during time spent in prison. Moreover, it shows the problems that have to be resolved to maintain health during time spent in prison. It also highlights the importance of taking actions leading to inmates' health improvement.

Keywords: prisoners; health; health promotion, imprisonment impact.

Introduction

The prison system in Poland is an extremely important element of the country's penal structure. It increases the sense of security of Poles because it contributes to behaviour in a country of law and order [1]. According to Polish law, persons who have committed a crime, after being arrested by a relevant law enforcement authority should be held responsible for the committed act. Depending on the nature of the crime committed, an appropriate penalty is imposed. The penalty of deprivation of liberty is considered to be the most repressive towards persons who violate legal norms. Thanks to the application of the aforementioned punishment, the perpetrators of the offence are temporarily or permanently isolated from society, thanks to which it is not exposed to further criminal activities of the said persons [2]. Prisons are guarded establishments and places of forced isolation for the execution of imprisonment. It is assumed that the said punishment should bring about a positive change in the inmate and prevent him from committing any crime. Staying within the walls of the aforementioned institution is related to several adverse health aspects.

According to the World Health Organization (WHO) "health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity" [3]. Human health is determined, following the concept proposed by Marc Lalonde, by 4 determinants: lifestyle, environment, genetic factors and health protection. Human health determines the lifestyle most strongly from the above-mentioned factors. It can be defined as a way of life that is the result between individual preferences and patterns of behaviour for a given individual or community and living conditions are determined by socio-economic, psychological and cultural factors. A healthy lifestyle reduces the risk of serious diseases or premature death [4]. The basic behaviours included in its composition include: reducing alcohol abuse, stopping smoking, physical activity, following a properly balanced diet and avoiding stress and regular preventive examinations [5]. Restrictions related to serving a sentence of imprisonment adversely affect the physical health and the mental health of inmates. These limitations include: performing all life activities under supervision, according to a strictly planned daily schedule, being constantly in the presence of other people in a confined space, as well as constant exposure to severe stress.

Purpose

The main goal of the study was to assess selected areas of health of respondents in prison, with particular emphasis on physical and mental health as well as lifestyle and pro-health behavior. The specific objectives were: an attempt to demonstrate the relationship between the length of stay in a prison, and changes taking place in the essential health-related aspects mentioned above and testing the willingness of inmates to broaden their knowledge about health and ways of maintaining it.

Material and methods

The study included 153 (100%) men aged 18 to 55 staying in the Penitentiary Institution in Racibórz. 51 inmates were serving their sentences for the first time, and another 51 were penitentiary recidivists. The remaining 51 people were convicts with non-psychotic mental disorders.

An original questionnaire consisting of questions concerning the described issues was used to conduct the study. Completion of the anonymous questionnaire was entirely voluntary, and the criterion for inclusion into the study was the willingness to complete the questionnaire reported by inmates. All respondents gave both verbal and written informed consent to participate in the study in accordance with the provisions contained in the prepared study protocol which was presented to all respondents before completing the

questionnaire. The consent to conduct the study was also obtained from the director of the discussed penitentiary institution for conducted it. All methods were carried out in accordance with relevant guidelines and regulations.

To preserve the anonymity of the respondents, questionnaires were distributed in white, unmarked envelopes. After completing the questionnaire, each respondent sealed an envelope with a filled questionnaire inside. The sealed envelopes were placed in a specially prepared, closed box, which was opened, and the envelopes with the questionnaires were removed only when the respondents' answers were entered into the database.

The questions contained in the questionnaire were grouped into four categories:

- physical health status - questions related to the current state of health and health before imprisonment,
- mental health state - questions about self-harm and suicide attempts,
- healthy lifestyle - questions about diet, physical activity, use of stimulants and lifestyle (e. g. amount of time spent on sleep),
- pro-health behaviors - questions related to disease prevention and disease-preventing behavior.

Then, for statistical analyzes, the inmates were divided into 5 groups depending on the duration of imprisonment: up to 1 year,> 1-5 years,> 5-10 years,> 10-20 years and over 20 years.

The results obtained in each category were converted into a 100-point scale, and then a 5-point Likert Scale was used, dividing the results into very bad (0-20 points), bad (21-40 points), average (41-60 points), good (61-80 points) and very good (81-100 points) Finally, with the use of the *Statistica* 13.1 software, an analysis of the obtained results was carried out using the Chi2 test to investigate the relationship between the obtained results and the time spent in prison.

Results

I. General characteristics of the studied group.

The general characteristics of the studied group are presented in **Table 1**.

Tab. 1. General characteristics of the studied group.

Examined group (n=153; 100%)			
	Variables	n	%
Age (years)	18-20	5	3,27
	21-35	74	48,4
	36-45	40	26,14
	46-50	18	11,76
	51-55	10	6,54
	>55	6	3,92
Place of residence before imprisonment	City	116	75,81
	Village	26	16,99
	No place to live	11	7,20
Education	Incomplete primary	13	8,49
	Primary	49	32,02
	Vocational	79	51,63
	Secondary	7	4,58
	Higher	5	3,27
Length of the sentence being served (years)	<5	64	41,83
	5-10	45	29,41
	11-15	27	17,64
	16-20	7	4,57
	21-25	5	3,26
	>25	5	3,26

Explanation of abbreviations: n – number of respondents.

The largest group of inmates were men aged 21 to 45. Most of the respondents lived in the city before their imprisonment. People with higher education constituted the lowest percentage of inmates.

II. Assessment of inmates' physical health.

Figure 1 presents the characteristics of the studied group, taking into account the presence of chronic diseases before imprisonment, while **Figure 2** presents the characteristics of the studied group, taking into account the most common ailments reported by the respondents.

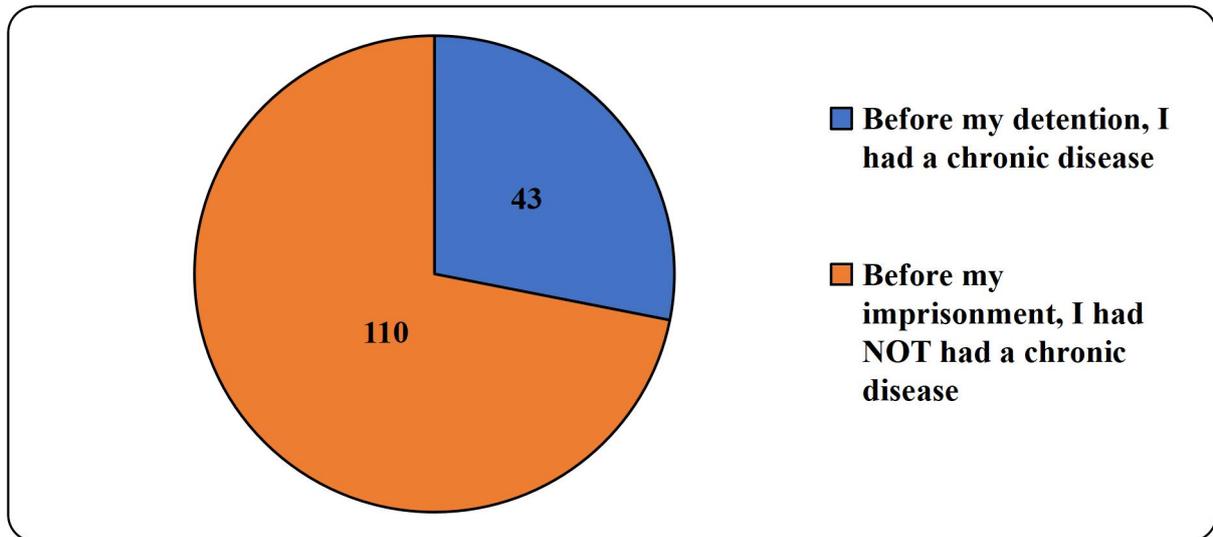


Fig. 1. Characteristics of the studied group, taking into account the presence of chronic diseases among the respondents before imprisonment.

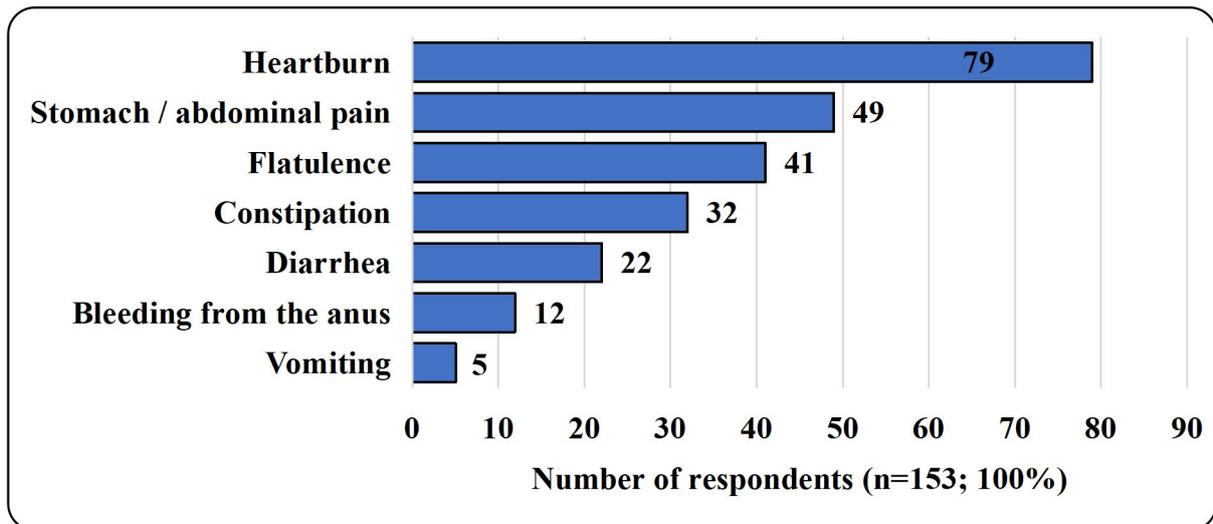


Fig. 2. Characteristics of the studied group, taking into account the most common ailments reported by inmates.

Almost 30% of respondents declared the presence of chronic diseases before imprisonment, and more than half of the most common ailments after imprisonment included heartburn.

Figure 3 presents the characteristics of the studied group of prisoners including self-assessment of their physical health. On the other hand, **Figure 4** presents the characteristics of the respondents, taking into account the results of the analysis of the physical health of the inmates.

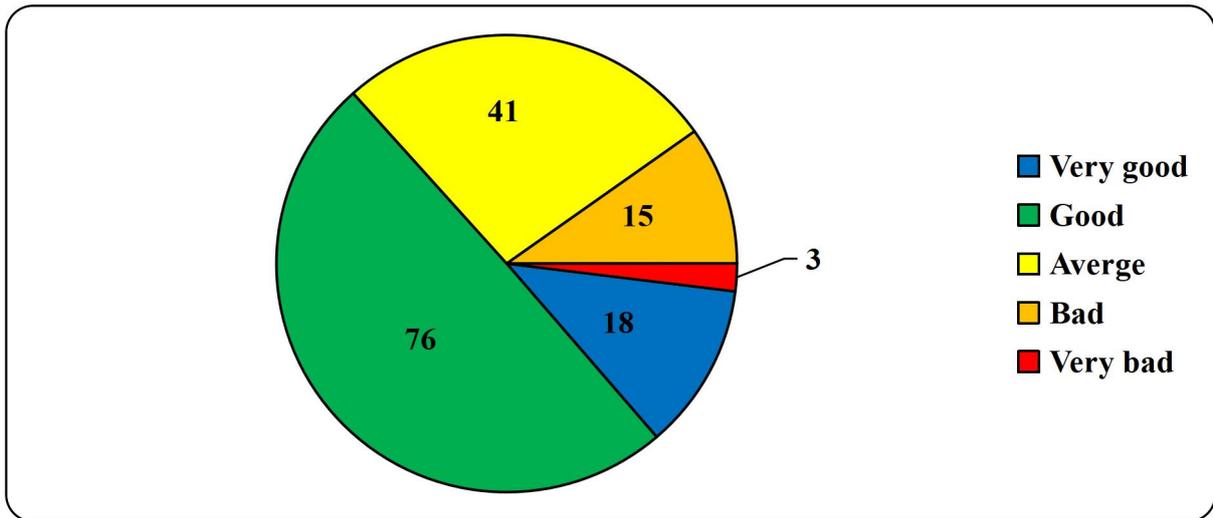


Fig. 3. Characteristics of the studied group of inmates, including the self-assessment of their general health.

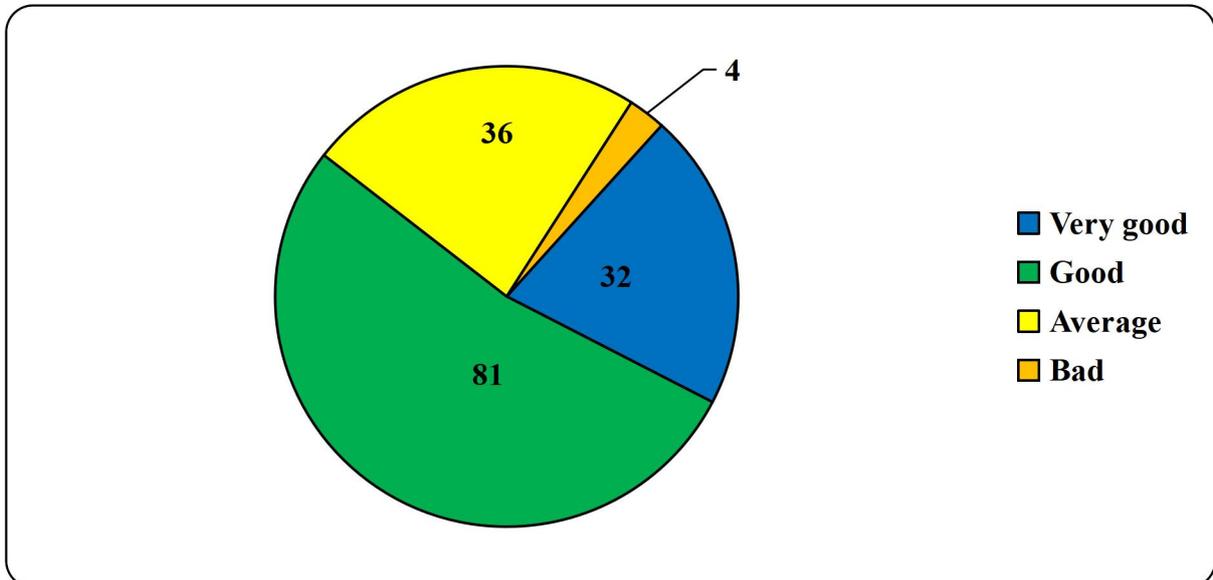


Fig. 4. Characteristics of the studied group, taking into account the results of the analysis carried out in terms of the assessment of the physical health of prisoners.

Over 60% of the respondents assessed their general health positively. Conducted analysis showed that more than half of the respondents showed good physical health and was significantly different ($\chi^2=13.8$; $p=0.0083$) from the self-assessment made by the respondents.

Figure 5 shows the characteristics of the studied group of prisoners, taking into account the relationship between the length of stay in prison and the assessment of physical health.

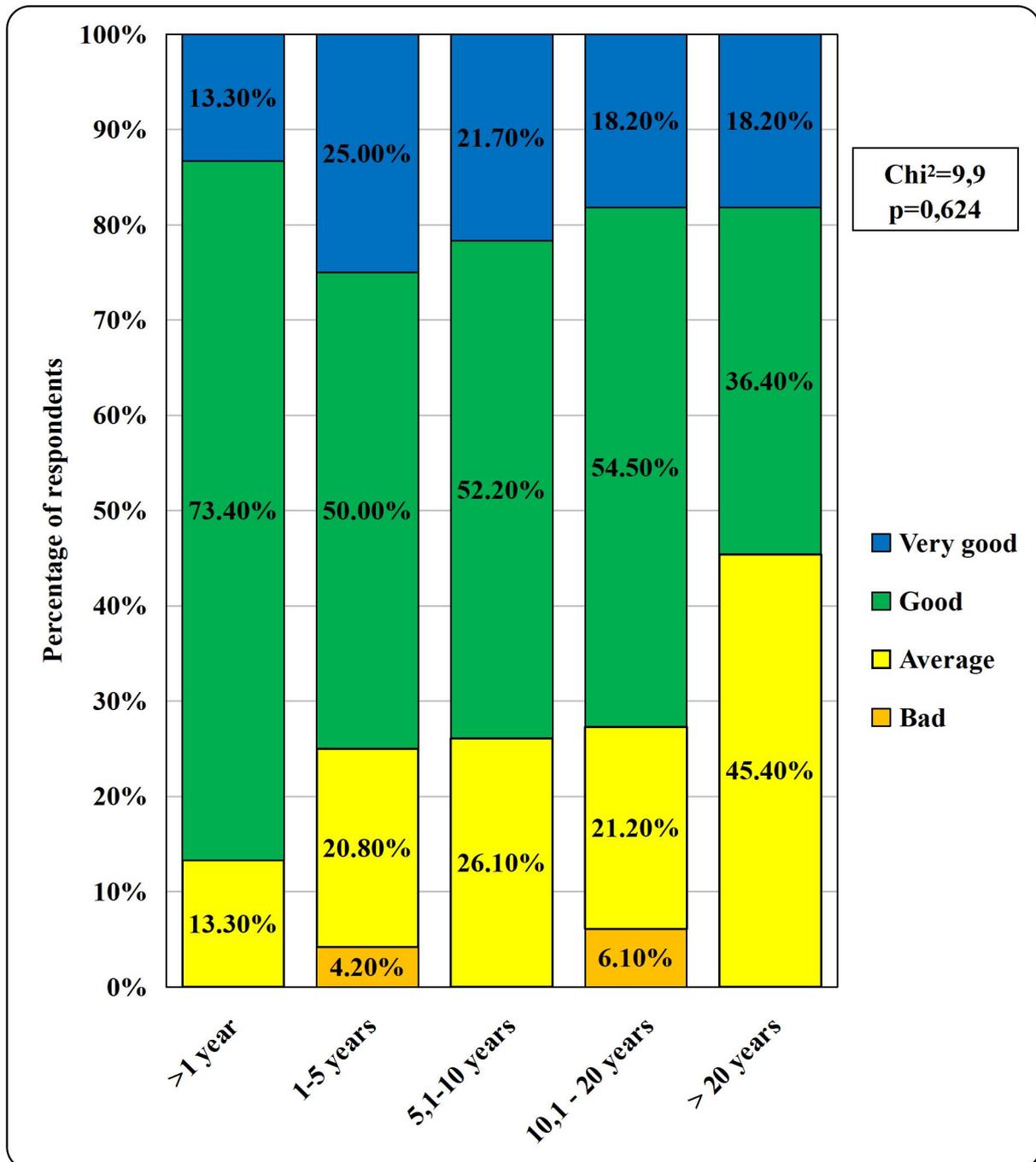


Fig. 5. Characteristics of the studied group of inmates, taking into account the relationship between the assessment of the state of physical health and the length of stay in a prison.

The conducted analysis did not show a statistically significant correlation between the time spent in prison and the physical health of the inmates ($p=0,624$).

III. Assessment of the inmate's mental health.

The characteristics of the studied group of inmates, including suicide attempts before and after planting in a prison, are shown in **Figure 6**. **Figure 7** shows the characteristics of the studied group, including self-mutilation while serving a prison sentence.

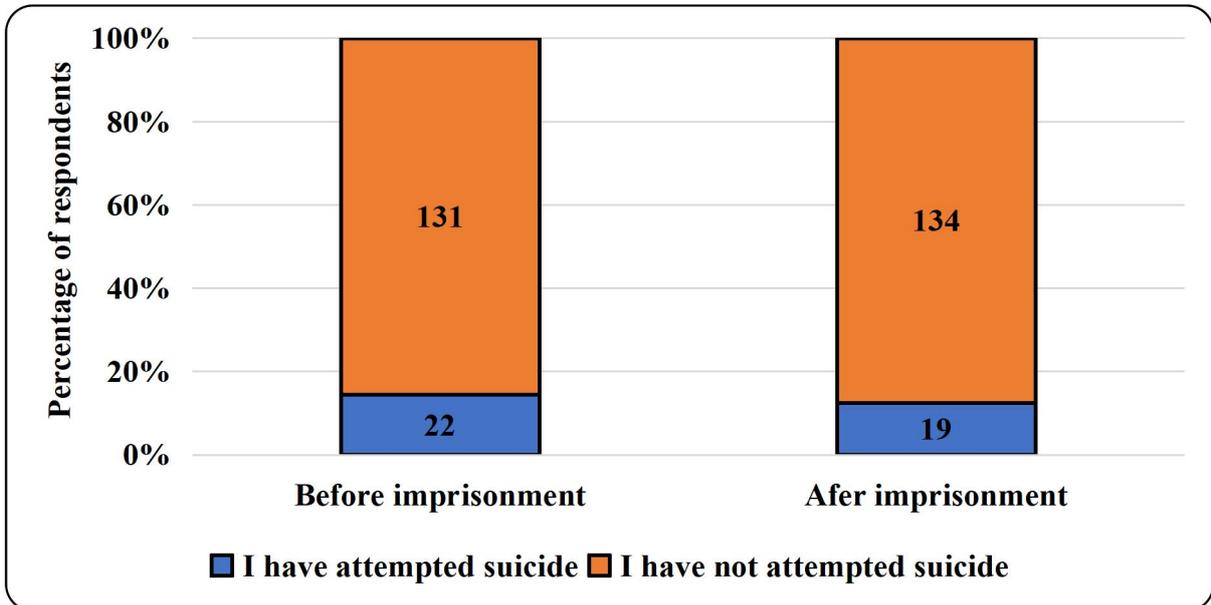


Fig. 6. Characteristics of the studied group, taking into account suicide attempts taken by the respondents before and after imprisonment.

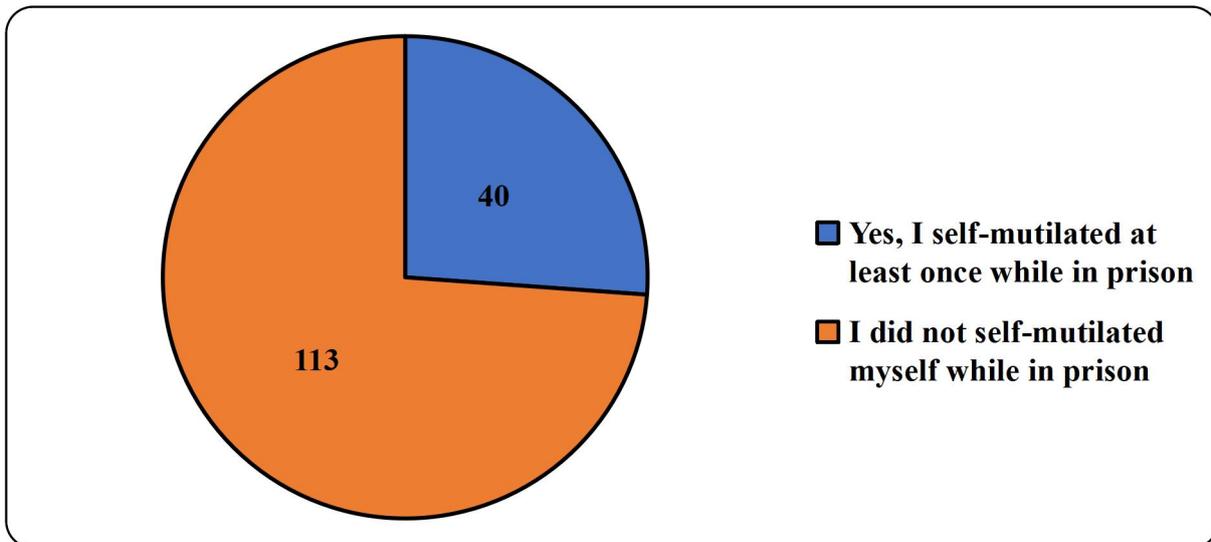


Fig. 7. Characteristics of the studied group, including self-mutilation while serving a prison sentence.

Suicide attempts after imprisonment were made by 3 fewer respondents than before imprisonment, and during their stay in prison, more than 25% of respondents committed at least one self-harm.

The characteristics of the studied group of prisoners, including the assessment of their mental health, are presented in **Figure 8**.

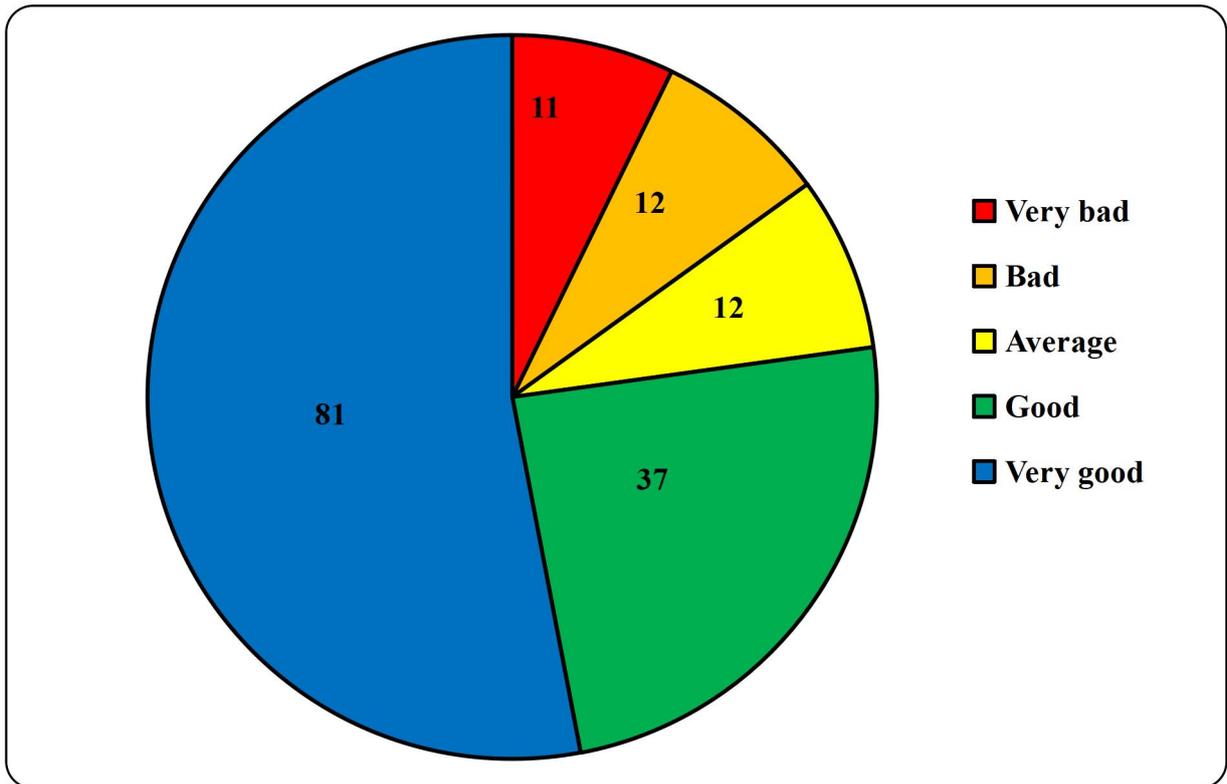


Fig. 8. Characteristics of the studied group of prisoners, including the assessment of their mental health.

As a result of the analysis, only about 16% of the respondents had very bad or poor mental health.

Figure 9 presents the characteristics of the studied group of inmates, taking into account the relationship between the assessment of their mental health and the duration of their stay in a prison.

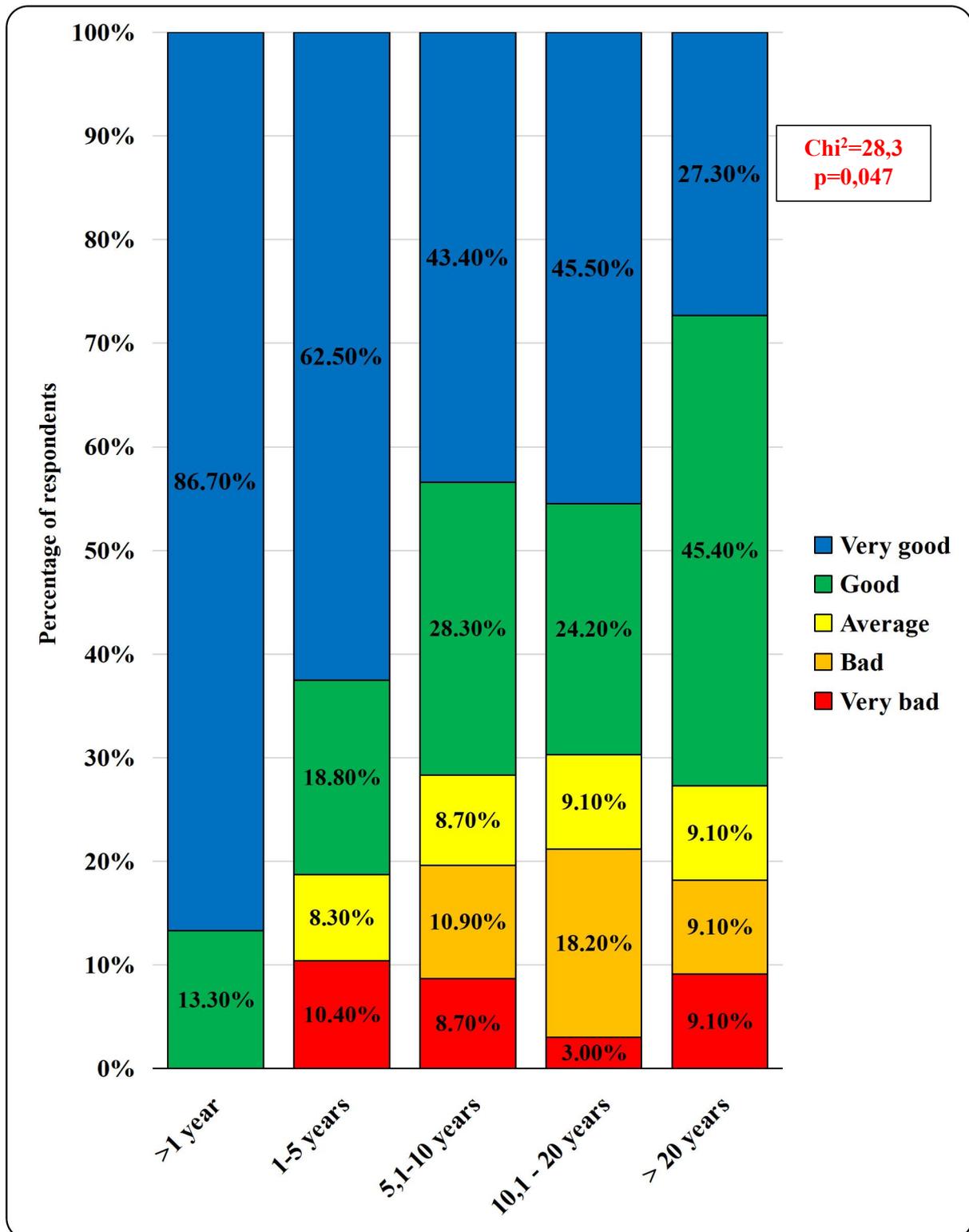
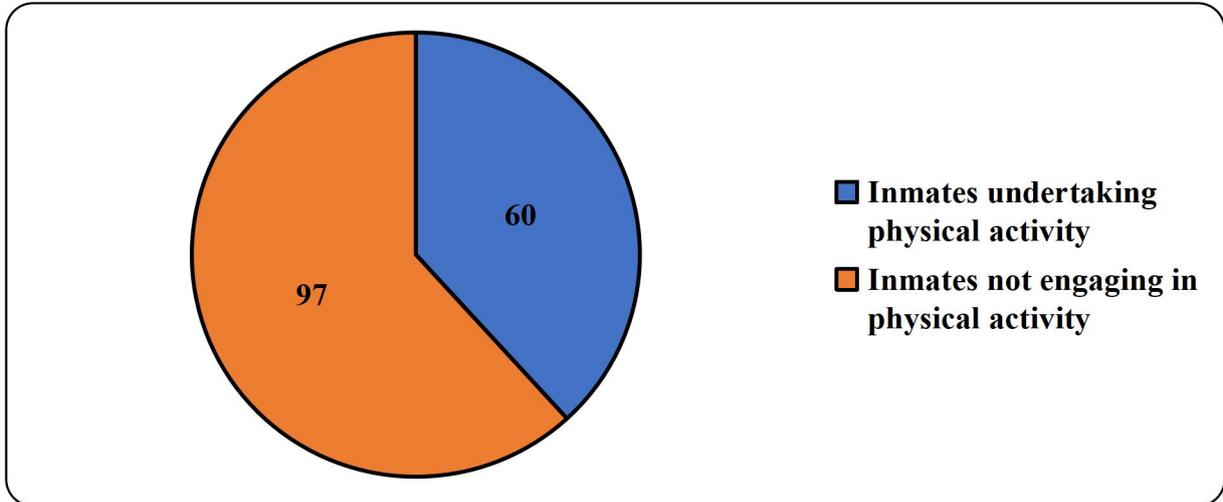


Fig. 9. Characteristics of the studied group of inmates, taking into account the relationship between the assessment of mental health and the duration of imprisonment.

The conducted analysis showed a statistically significant ($\chi^2=28.3$; $p=0.047$) deterioration of mental health along with the length of stay in a prison.

IV. Assessment of inmates' lifestyle.

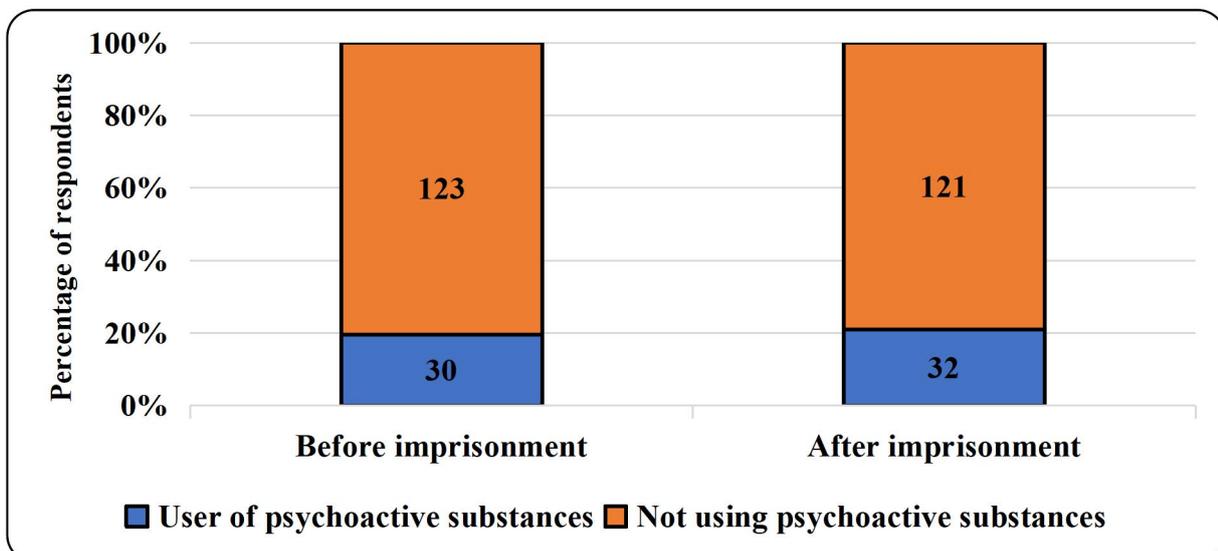
The characteristics of the studied group of inmates, taking into account their physical activity, are shown in **figure 10**. **Figure 11** presents the characteristics of the studied group of inmates, including the use of psychoactive substances before and after their incarceration. **Figure 12** presents the characteristics of the studied group of inmates, including alcohol consumption before and after imprisonment. **Table 2** presents the characteristics of the studied group of people declaring alcohol consumption before imprisonment, taking into account the manner of its consumption, and **table 3** presents the characteristics of the studied group, including



smoking in a prison.

Fig. 10. Characteristics of the studied group of inmates, taking into account their physical activity.

Fig. 11. Characteristics of the studied group, including the consumption of psychoactive substances before and during imprisonment.



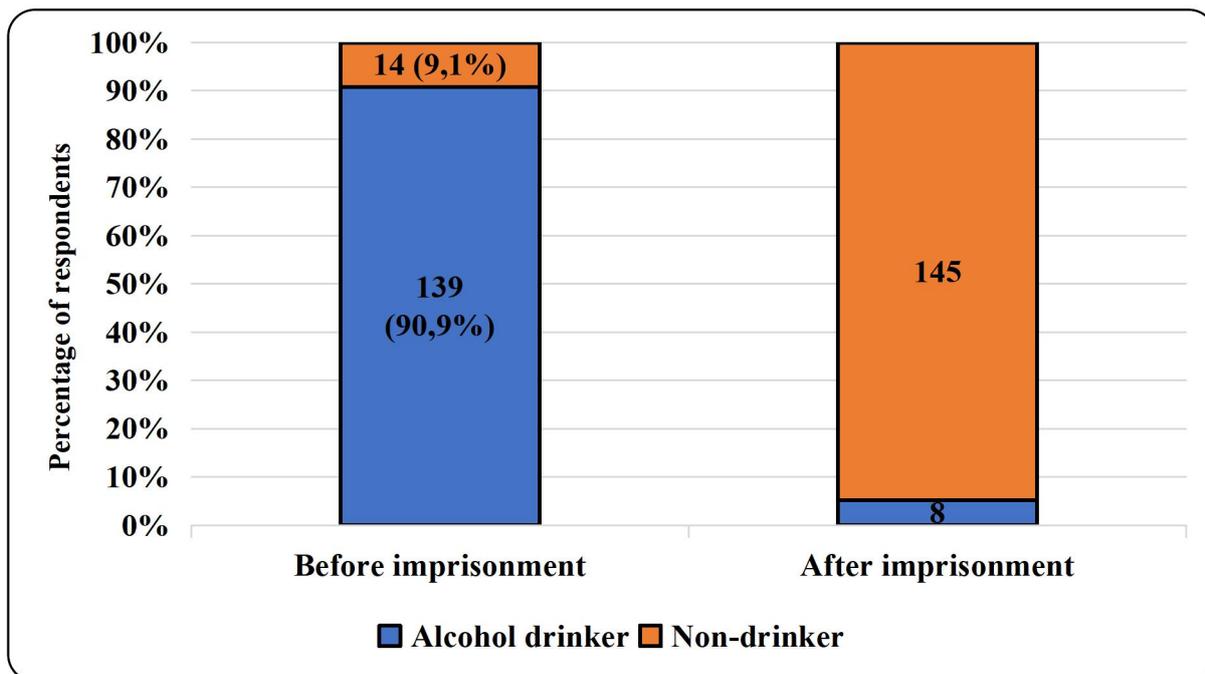


Fig. 12. Characteristics of the studied group, including alcohol consumption before and during imprisonment.

Tab. 2. Characteristics of the surveyed group of respondents declaring alcohol consumption before imprisonment, including the manner of its consumption.

Group of inmates consuming alcohol before imprisonment (n = 139; 100%)		
Alcohol consumption	n	%
Occasional	81	58,2
Overuse	43	30,9
Addiction + treatment	12	8,6
Addiction + no treatment	3	2,3

Explanation of abbreviations: n- number of respondents.

Tab. 3. Characteristics of the studied group of prisoners, including smoking in a prison.

Studied group (n = 153; 100%)					
Smoking in a prison		Min. cigarettes / day	Max. cigarettes / day	M	SD
No	Yes				
60 (36,3%)	93 (63,7%)	4	40	16	8

Explanation of abbreviations: n – number of respondents, Min. – the minimum number of cigarettes smoked per day, Max. – a maximum number of cigarettes smoked per day, M – mean, SD – standard deviation.

Only about 36% of the respondents undertook regular physical activity. Almost 21% of respondents declared the use of psychoactive substances, and about 5% consumed alcohol while serving a prison sentence. The highest percentage of inmates who consumed alcohol before imprisonment consumed it occasionally. Almost 65% of the respondents smoked cigarettes. On average, each of the inmates smoked 16 cigarettes a day.

Figure 13 presents the characteristics of the studied group of prisoners including an assessment of their lifestyle.

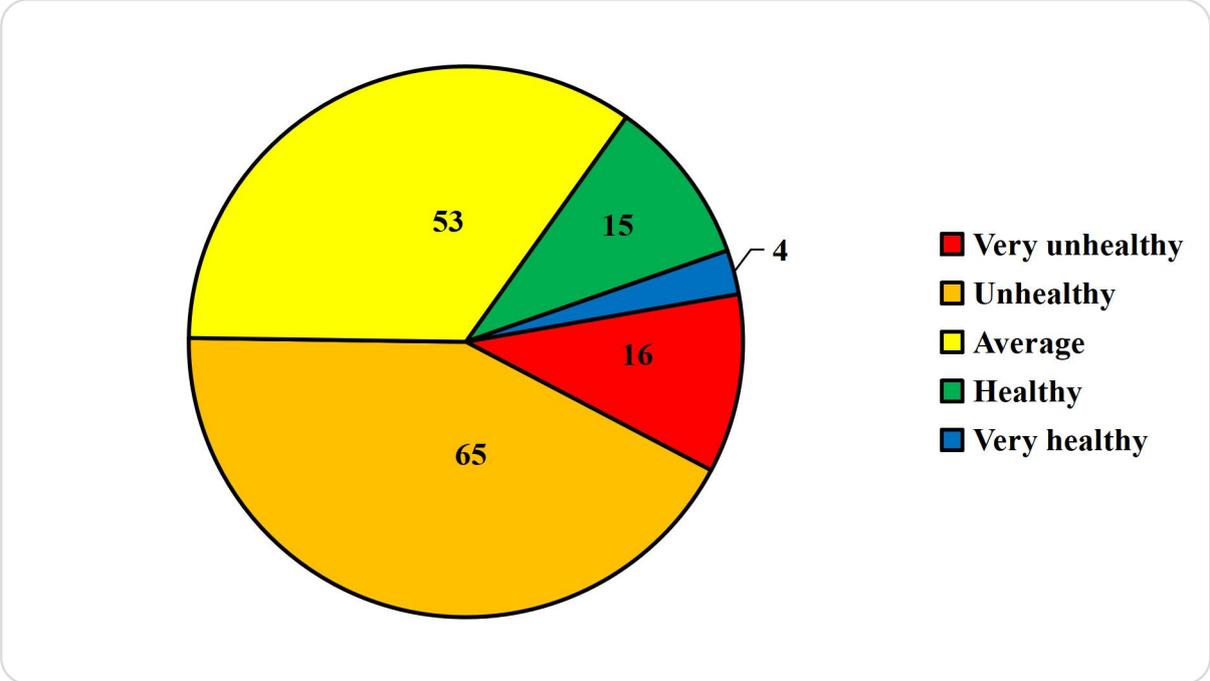


Fig. 13. Characteristics of the studied group of inmates, including the assessment of their lifestyle.

Almost 80% of the surveyed prisoners had an unhealthy or very unhealthy lifestyle.

Figure 14 shows the characteristics of the studied group of prisoners, taking into account the relationship between the lifestyle and the length of stay in a prison.

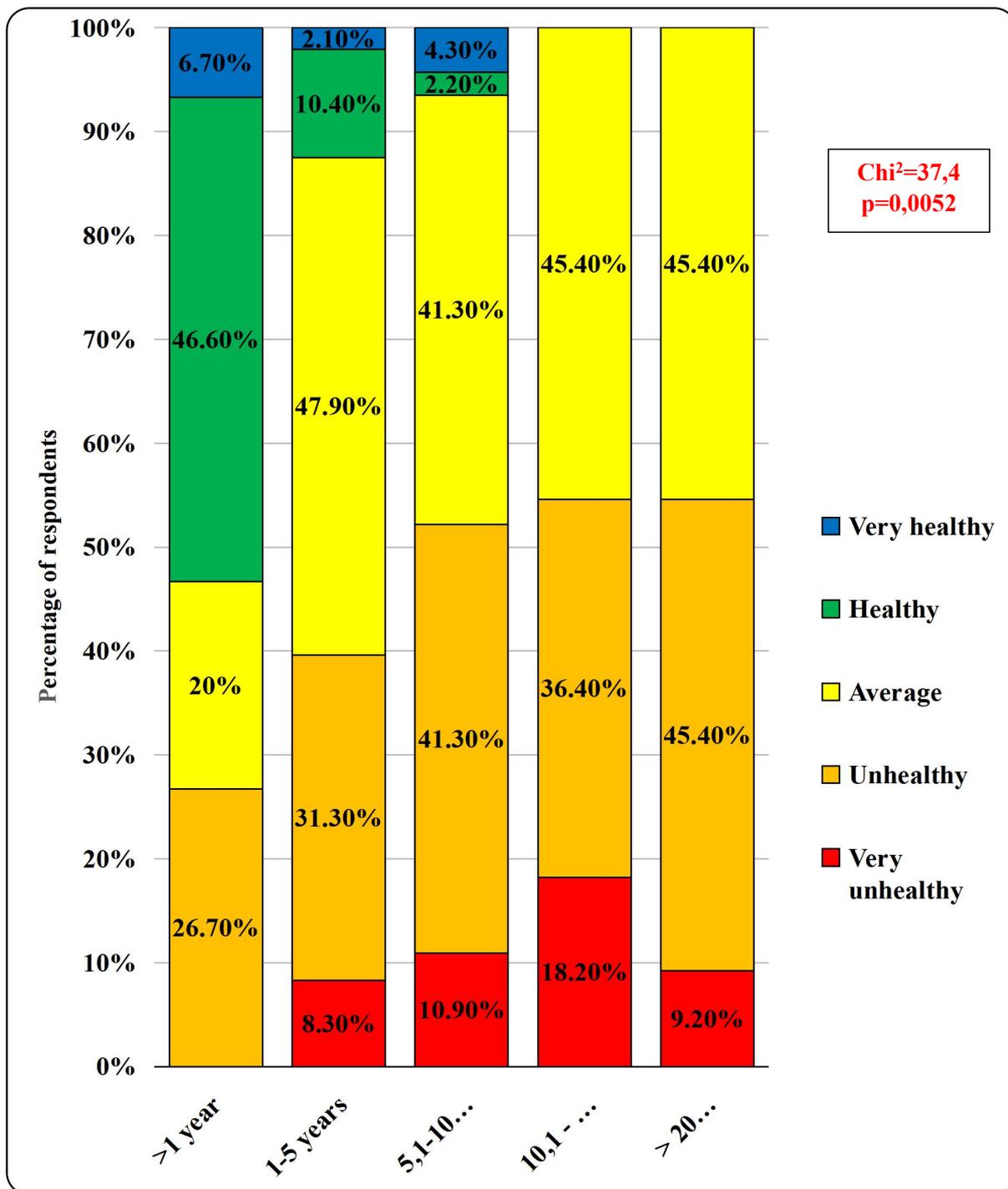
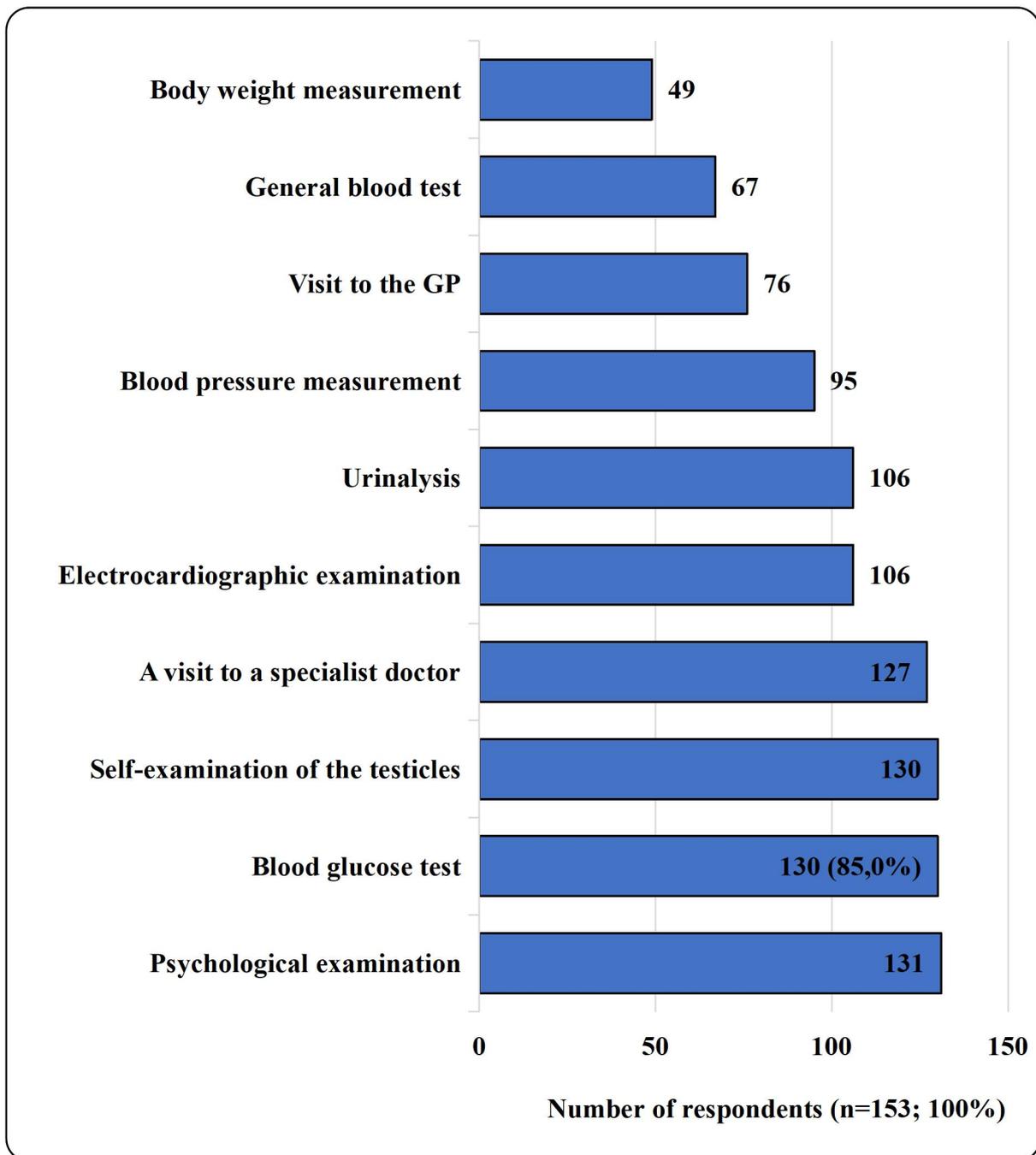


Fig. 14. Characteristics of the studied group of inmates, taking into account the relationship between the lifestyle and the length of imprisonment.

The analysis showed a statistically significant ($\text{Chi}^2=37.4$; $p=0.0052$) worsening of the lifestyle along with the extension of the time spent in prison.

V. Assessment of inmates' health-promoting behaviors.

The characteristics of the surveyed group of inmates, taking into account the number of respondents



who **did not regularly** perform selected pro-health activities, are presented in **figure 15**.

Fig. 15. Characteristics of the studied group of prisoners, including the selected ones, pro-health activities are undertaken by the respondents.

Self-examination of the testicles was not performed by 85% of the respondents, and blood pressure was measured regularly in only about 62% of the inmates.

More than half of the inmates (84; 54.9%) showed very bad or bad, 49 (32%) - average, and only 20 (13.1%) good or very good pro-health behaviour.

The characteristics of the studied group, taking into account the relationship between pro-health behaviour and the length of stay in a prison, are presented in figure 16.

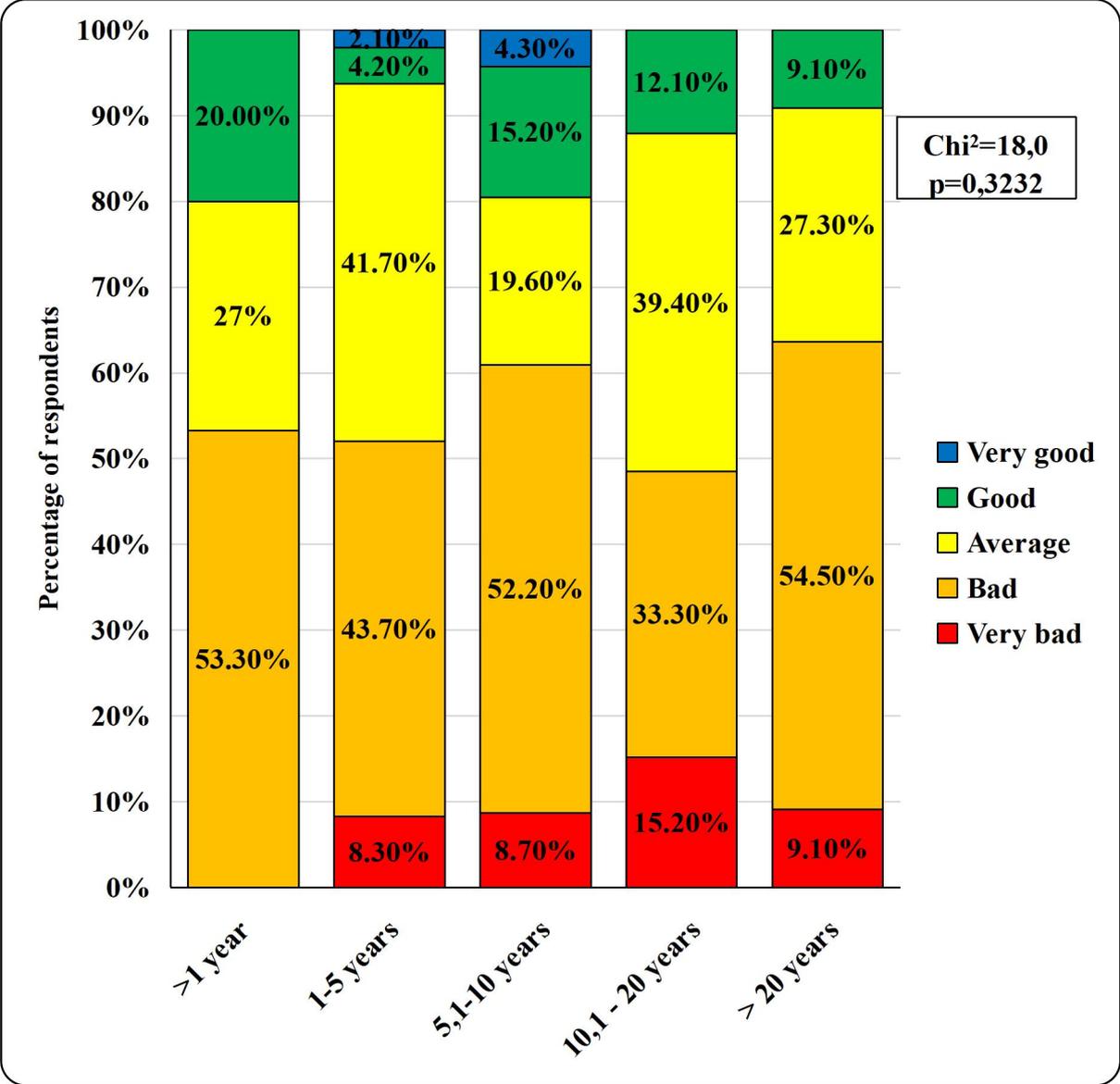
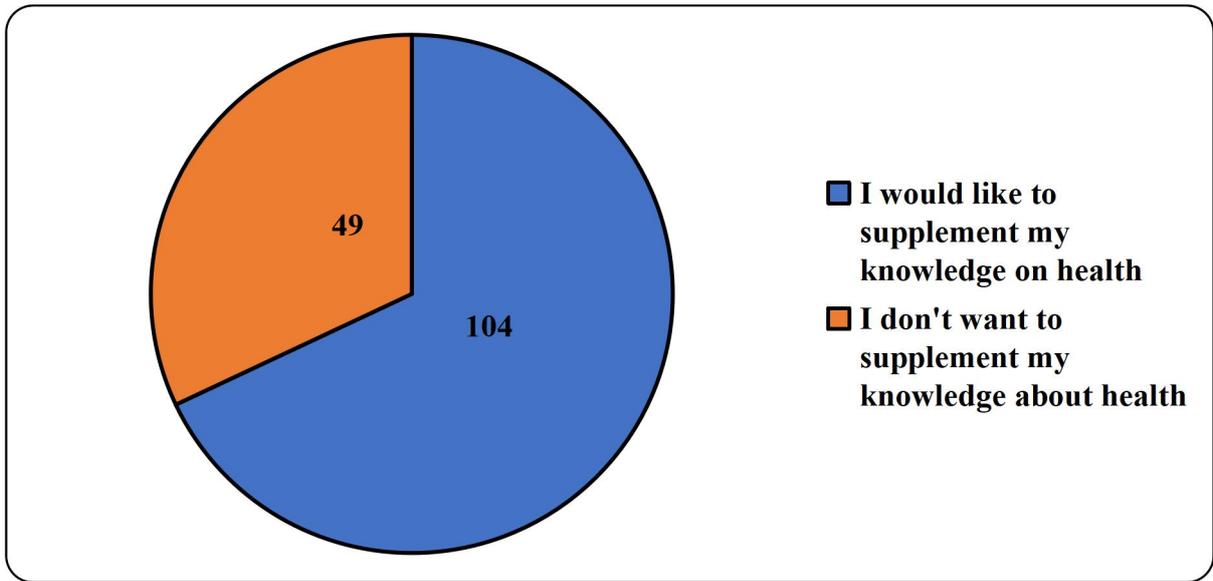


Fig. 16. Characteristics of the studied group of inmates, taking into account the relationship between pro-health behaviours and the length of stay in a prison.

There was no statistically significant correlation between the time of serving the sentence and the pro-health behaviour of inmates.

VI. Willingness to improve knowledge about health and ways of maintaining it.

The characteristics of the group of inmates, including their willingness to improve their knowledge in the field of health, are presented in **figure 17**. **Figure 18** shows the characteristics of the studied group of inmates declaring a willingness to deepen their knowledge of health, taking into account the areas in which



they would like to deepen their knowledge.

Fig. 17. Characteristics of the studied group of inmates, including the willingness to improve their health knowledge.

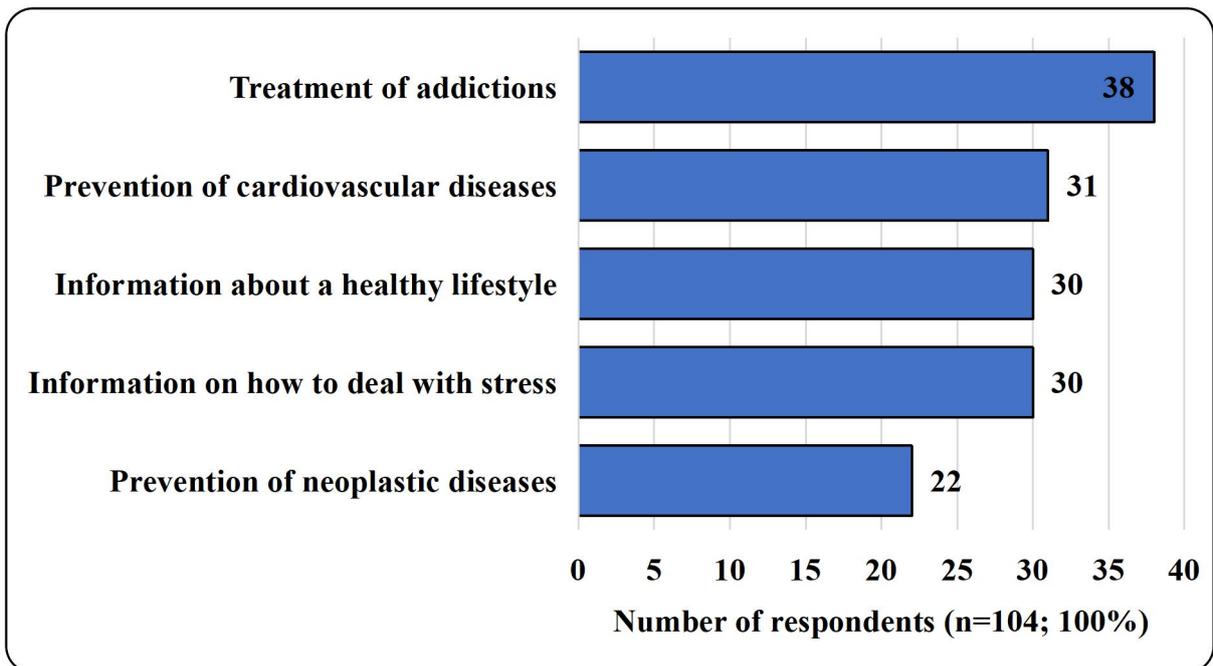


Fig. 18. Characteristics of the surveyed group of respondents declaring a willingness to improve knowledge in the field of health, taking into account the areas in which the respondents would like to deepen their knowledge.

Almost 70% of inmates wanted to extend their knowledge of health and ways of maintaining it. The most frequently indicated area of health knowledge was the treatment of addictions and the prevention of cardiovascular diseases.

Discussion

The results presented in the article show the problem of changes in the health condition of inmates with the time spent in prison. In the studied group, over 60% of prisoners assessed their physical health as positive.

There was no statistically significant correlation between the time spent in prison and the physical health of the inmates. Different results were obtained in the research by P. Stępnia, who showed a clear relationship between the age of prisoners and their subjective state of health. In his study, the younger the prisoner was, the more positive his self-assessment of his health was, and the relationship was statistically significant ($p > 0.001$, $\chi^2 = 23, 245$) [6]. It is worth mentioning that the health condition of inmates is the result of two factors: the lifestyle of the inmates before being sent to prison and the impact of prison conditions. In his work, M. Kopciuch noticed that a large percentage of inmates presented deplorable health conditions at the time of their admission to the penitentiary institution. In addition, inmates are often people who have problems with alcohol abuse or suffer from parasitic diseases, e. g. head lice. It was not uncommon for prisoners to be diagnosed with somatic or mental diseases in a prison [7].

Undoubtedly, a stressful factor in serving a sentence is long-term isolation. As is well known, stress is a factor that negatively affects mental and physical health. The analysis carried out by the authors showed a statistically significant relationship between the time spent in prison and the deteriorating mental health of inmates ($\chi^2 = 28.3$, $p = 0.047$). The prison environment is detrimental to mental health, for example through the temporary or permanent exclusion of the inmate from society and the elimination of the purpose and meaning of his life. Moreover, factors such as cell overcrowding, isolation and routine exposure to violence have further negative effects beyond the mere prospect of incarceration. Long-term imprisonment may lead to "post-incarceration syndrome", which with symptoms resembles post-traumatic stress disorder (PTSD). The characteristic symptoms of both include: reliving a traumatic situation in intrusive memories (so-called flashbacks) and nightmares, a sense of numbness and the inability to experience pleasure, avoiding activities and situations that may resemble a past trauma, over-agitation state of vegetative with excessive vigilance and increased reactivity to stimuli and insomnia [8].

Not infrequently, under the influence of severe stress related to serving a prison sentence, prisoners attempt suicide and/or self-harm. According to Orzechowska A.'s research, people who perform self-injuries most often incise blood vessels (84%) [9]. A meta-analysis conducted by Zhong S. et al. showed that the strongest clinical factors associated with a prisoner's committing suicide were the occurrence of suicidal thoughts (OR 15.2, 95% CI 8.5-27.5) and a history of suicide attempts (OR 8.2, 4.4-15.3). Institutional factors related to committing suicide included occupying a single cell (OR 6.8, 2.3-19.8) and no visits from family or friends (OR 1.9, CI 1.5-2.4). Criminological factors included prior arrest (OR 3.6, CI 3.1-4.1), serving a life sentence (OR 2.4, CI 1.3-4.6) and conviction for a violent crime, especially homicide (OR 3.1, CI 2.2-4.2) [10]. Similar results were presented by Favril L. et al. based on a meta-analysis of risk factors most strongly associated with self-harm. According to the above-mentioned authors, the described factors contributing to self-harm include: history of suicidal thoughts (OR 8.9, 6.1-13.0; I² = 56%), as well as previous self-harm (OR 6.6, 5.3 -8.3; I² = 55%) and a history of psychiatric diagnosis (OR 8.1, 7.0-9.4; I² = 0%). The factors different from Zhong S.'s analysis included severe depression (OR 9.3, 2.9-29.5; I² = 91%) and borderline personality disorder (OR 9.2, 3.7-22.5; I² = 81%). Institution-specific environmental risk factors for self-harm included: solitude (OR 5.6, 2.7-11.6; I² = 98%) and violation of discipline (OR 3.5, 1.2-9.7; I² = 99 %) and experiencing sexual or physical victimization in prison (OR 3.2, 2.1-4.8; I² = 44%) [11]. Preventive interventions by prison staff should address these risk factors and include better access to evidence-based psychiatric care for inmates, as these and other studies have shown that time spent in prison has a detrimental effect on the mental health of, especially in those with a previous history of existing mental illness [12,13].

The study showed that more than half of the respondents led an unhealthy or very unhealthy lifestyle and its significant deterioration along with the extension of the duration of their stay in prison. On the other hand, no statistically significant correlation was found between the time of serving a sentence and the pro-health behaviour of the inmates. One of the complications of an incorrect lifestyle is the development of obesity. Rocca D.'s research showed an increased prevalence of overweight and obesity among prisoners (66.9%) compared to the prevalence of obesity in Italians from the general population (54.8%). According to the above-mentioned author, the decreasing physical activity typical of serving a sentence of imprisonment, as well as psychophysical discomfort (trauma of imprisonment) and prison meals could have had a significant impact on the increase in body weight of inmates [14]. A meta-analysis by Gebremariam M. et al. Showed a mean weight gain of 0.2 (95% CI 0.14, 0.72) kg/week. In all studies analysed by Gebremariam M. et al., including those on the perceived weight change, a high percentage (43% to 73%) of participants reported weight gain [15]. Different results from those quoted were obtained by Choudhry K et al. The results of the meta-analysis conducted by these scientists showed that obesity prevalence rates among prisoners range from 8.1% to 55.6%, with the prison population often having a lower obesity level than the general population [16].

Almost 70% of inmates wanted to extend their knowledge of health and ways of maintaining it. The most frequently indicated area of knowledge that the respondents wanted to deepen was the treatment of addictions and their prevention. There was also a group of inmates who wanted to learn stress-coping techniques. According to WHO guidelines, in addition to providing prisoners with adequate health care, they should also be provided with health education and other interventions in the field of health promotion and a healthy lifestyle.

All prisoners need this education, although not necessarily to the same extent, as not all will be exposed to what is known as the "high risk" lifestyle (drug use, unsafe behaviour, etc.) after serving their sentence. Nevertheless, each inmate should be provided with information on communicable disease prevention, 'high-risk' lifestyle, including advice on how to avoid the use of drugs and drug overdose after release from prison, support in undertaking healthy behaviours and habits (adequate level of physical activity, balanced diet, smoking cessation, etc.), and mental health-promoting behaviours (adequate time spent in interacting with others, maintaining family ties, etc.). Many inmates will also need training in psychological skills, such as anger management, job search skills, parental education, and social and life skills. Other prisoners, on the other hand, will need such mundane information as the current state of their health, or information on access to cancer prevention [17]. The limitations of the study include a small group of respondents. Unfortunately, researches conducted in prisons are not the simplest one to conduct. The inmates' distrust towards people from outside and their requests are very high. Another problem is the failure to provide fully consistent information about one's health, especially in the field of mental health. A large group of inmates did not provide correct information probably because of their beliefs or a lack of knowledge about the symptoms of mental illnesses such as depression. The foundations of prison health promotion programs should be respected for the rights of the individual, which are the basis of all aspects of prison life. It should also be noted that keeping prisons clean, with the appropriate equipment, paying attention to problems reported by prisoners, as well as protecting inmates from harm and fair and consistent treatment by staff may contribute to reducing the negative effects on human health during imprisonment.

Conclusions

The conducted evaluation showed that most of the inmates were characterized by good physical health, very good mental health and an unhealthy lifestyle, as well as very bad or bad pro-health behaviour. Negative changes in the mental health and lifestyle of inmates were observed along with the extension of the time spent in prison. Most of the interviewed prisoners declared their willingness to supplement their knowledge about health and ways of maintaining it. Actions should be implemented to alleviate the adverse health effects of both short- and long-term imprisonment and to help inmates improve their health after serving a prison sentence. Further research should focus on increasing medical professionals' knowledge about the causes of inmates' health deterioration, as well as how they would like to receive information about health and its maintenance. An attempt should also be made to conduct long-lasting research that accurately illustrates the changes in various areas of health occurring during imprisonment.

References

1. Powalko O. The prison system in Poland and internal security [in Polish]. *OBRONNOŚĆ Zeszyty Naukowe*. 2017; 2(22): 169-194.
2. Powalko O. The prison system in Poland and internal security [in Polish]. *OBRONNOŚĆ Zeszyty Naukowe*. 2017; 4(24): 138-159.
3. Basic Documents – 49th edition, World Health Organization, 2020. https://apps.who.int/gb/bd/pdf_files/BD_49th-en.pdf (Accessed: 17.03.2023).
4. World Health Organization. Regional Office for Europe. Healthy living: what is a healthy lifestyle? <https://apps.who.int/iris/handle/10665/108180> (Accessed: 17.03.2023)
5. Wardle J, Steptoe A. The European Health and Behaviour Survey: rationale, methods and initial results from the United Kingdom. *Social Science and Medicine*. 1991;33(8):925–936.
6. Stepniak P. Health situation and health protection of inmates in prisons [in Polish]. *Archiwum Kryminologii*. 2013; 35: 333-375.
7. Kopciuch M, Polewka A. Mental and somatic disorders of people who committed suicide in penitentiary institutions in Poland in 1995-1997 [in Polish]. *Archiwum Medycyny Sądowej i Kryminologii*. 2006; 56: 86-90.
8. Liem M, Kunst M. Is there a recognizable post-incarceration syndrome among released "lifers"? *Int J Law Psychiatry*. 2013; 36(3-4): 333-337. DOI: 10.1016/j.ijlp.2013.04.012.
9. Orzechowska A, Wysokiński A, Bałeczka A, Drozda R, Florkowski A, Gałęcki P, Zboralski K. Self-mutilation among prisoners and psychosocial factors [in Polish]. *Suicydologia*. 2008; 4(1): 42 – 48.
10. Zhong S, Senior M, Yu R, Perry A, Hawton K, Shaw J, Fazel S. Risk factors for suicide in prisons: a systematic review and meta-analysis. *Lancet Public Health*. 2021; 6(3):e164-e174. DOI: 10.1016/S2468-2667(20)30233-4.
11. Favril L, Yu R, Hawton K, Fazel S. Risk factors for self-harm in prison: a systematic review and meta-analysis. *Lancet Psychiatry*. 2020;7(8):682-691. DOI: 10.1016/S2215-0366(20)30190-5.
12. Hassan L, Birmingham L, Harty MA, Jarrett M, Jones P, King C, Lathlean J, Lowthian C, Mills A, Senior J, Thornicroft G, Webb R, Shaw J. Prospective cohort study of mental health during imprisonment. *Br J Psychiatry*. 2011; 198(1): 37-42. DOI: 10.1192/bjp.bp.110.080333.

13. Armour C. Mental health in prison: a trauma perspective on importation and deprivation. *International Journal of Criminology and Sociological Theory*, 2012; 5(2): 886-894.
14. Rocca D. Prevalence of overweight and obesity in an Italian Prison and relation with average term of detention: a pilot study. *Ann Ig.* 2018; 30(1): 51-56. DOI: 10.7416/ai.2018.2195.
15. Gebremariam M., Nianogo R., Arah O. Weight gain during incarceration: systematic review and meta-analysis. *Obes Rev.* 2018;19(1):98-110. DOI: 10.1111/obr.12622.
16. Choudhry K, Armstrong D, Dregan A. Systematic review into obesity and weight gain within male prisons. *Obes Res Clin Pract.* 2018;12(4):327-335. DOI: 10.1016/j.orcp.2018.02.003.
17. Møller L, Stöver H, Jürgens R, Gatherer A, Nikogosian H. Health in prisons - A WHO guide to the essentials in prison health. Copenhagen 2007.

Declarations

Ethics approval and consent to participate

The research was conducted within the framework of the student scientific society. The presented topic “The penalty of imprisonment and its impact on the health of inmates - preliminary results” was part of a large project entitled “Medical knowledge of non-professionals as a predictor of health behaviour”, which was submitted to the Bioethics Committee at the Medical University of Silesia in Katowice. In the justification of the opinion, by the decision from 17.10.2017 (KNW/0022/KB/223/17), the Bioethics Committee stated that the research based on

a survey is not a medical experiment and that neither the evaluation nor the ethical approval of the committee is required to conduct it. All respondents gave their informed consent to participate in this study.

Consent for publication

Not applicable.

Availability of Data and Material (ADM)

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare no competing interests in this review.

Funding

None to declare.

Authors' contributions

J.D., H. K., M.Z., K.S., and O.S. contributed to the design and implementation of the research, analysis of the results and the writing of the manuscript. The author(s) read and approved the final manuscript.

Acknowledgement

Not applicable.