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ANALYSIS OF THE PHYSICAL ACTIVITY OF RURAL RESIDENTS IN THE PERSPECTIVE OF CHRONIC DISEASES ON THE EXAMPLE OF PATIENTS OF THE KRUS FARMERS' REHABILITATION CENTER IN JEDLEC.

Analiza aktywności fizycznej mieszkańców terenów wiejskich w perspektywie chorób przewlekłych na przykładzie pacjentów Centrum Rehabilitacji Rolników KRUS w Jedlcu.

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A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

Abstract (in Polish):

Cel pracy: Ocena poziomu aktywności fizycznej pacjentów obszarów wiejskich w okresie ostatnich 7 dni przed przybyciem do Ośrodka Rehabilitacyjnego w Jedlcu.

Materiał i metody: Badanie oparto na 612 osobach. Pacjentów podzielono na trzy grupy wiekowe: <49 lat, 50-59 lat oraz powyżej 60 lat. Ankietowani zostali poproszeni o wypełnienie autorskiego kwestionariusza zawierającego pytania dotyczące chorób przewlekłych i aktywności fizycznej. Oceniano jej intensywność, rodzaj i czas trwania. Uzyskane odpowiedzi zinterpretowano oraz zróżnicowano pod względem płci, wieku i wykształcenia.

Wyniki: Kobiety częściej od mężczyzn wykonywały intensywne, umiarkowane i siedzące czynności fizyczne (p=0,046), (p=0,003), (p=0,049). Wraz ze wzrostem wykształcenia rośnie częstość wykonywania intensywnych i umiarkowanych ćwiczeń fizycznych (p=0,030), (p=0,002). W przypadku wskaźnika BMI nie wykazano związku istotnie statystycznego pomiędzy tą zmienną a intensywnymi, umiarkowanymi i siedzącymi czynnościami fizycznymi (p=0,695), (p=0,439), (p=0,882). Nie wykazano statystycznie istotnego związku między wiekiem a intensywnym, umiarkowanym wysiłkiem fizycznym, 60-minutowym spacerem i siedzącym trybem życia w czasie wolnym odpowiednio (p=0,106), (p=0,198), (p=0,094), (p=0,876). Związek istotny statystycznie wykazano także pomiędzy wykształceniem badanych, a siedzącymi aktywnościami (p=0,001). Nie stwierdzono statystycznie istotnego związku między nadciśnieniem tętniczym a intensywnym, umiarkowanym wysiłkiem fizycznym i 60-minutowym marszem odpowiednio (p=0,276), (p=0,384), (p=0,761).

Wnioski: Systematyczna aktywność fizyczna niesie szereg pozytywnych efektów dla osób starszych. Instytucje promocji zdrowia powinny nieustannie kultywować wzorce zachowań odnoszące się do zdrowego stylu życia wśród Polaków.

Abstract (in English):

Aim: Evaluation of the level of physical activity of rural patients in the last 7 days before arrival at the Rehabilitation Center in Jedlec.

Material and methods: The study was based on 612 individuals. Patients were divided into three age groups: <49 years, 50-59 years and over 60 years. Respondents were asked to complete an original questionnaire containing questions about chronic diseases and physical activity. It was assessed in terms of its intensity, type and duration. The obtained answers were interpreted and differentiated according to sex, age and education.

Results: Women were more likely than men to have performed intense, moderate physical activities and leisure time sedentary behavior (p=0.046), (p=0.003), (p=0.049). As education increases, the frequency of intense and moderate exercise increases (p=0.030), (p=0.002). For BMI, there was no significant statistical association between this variable and intense, moderate physical activity and leisure time sedentary behavior (p=0.695), (p=0.439), (p=0.882). No statistically significant association was shown between age and intense, moderate physical activity, walking 60 minutes at time and leisure time sedentary behavior (p=0.106), (p=0.198), (p=0.094), (p=0.876) respectively. A statistically significant association was also shown between the subjects' education and leisure time sedentary behavior (p=0.001). There was no statistically significant association between hypertension and intense, moderate physical activity and walking 60 minutes at time (p=0.276), (p=0.384), (p=0.761) respectively.

Conclusions: Systematic physical activity has a number of positive effects for the elderly. Health promotion institutions should constantly cultivate behavioral patterns relating to healthy lifestyles among Poles.

Keywords (in Polish): edukacja zdrowotna, aktywność fizyczna, zdrowie publiczne, promocja zdrowia, obszar wiejski.

Keywords (in English): health education, physical activity, health promotion, public health, rural area.

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Short title
Aktywność fizyczna mieszkańców terenów wiejskich

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Authors (short)
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Introduction:

Regular physical activity has a positive impact on physical and mental well-being. According to the 2020 WHO guidelines, it is a factor in reducing the risk of non-communicable diseases (NCDs), such as metabolic diseases, cardiovascular diseases, and cancers, further supporting treatment against them [1]. Performing sports activities prevents cognitive decline, symptoms associated with depression, and lowers anxiety levels [2,3]. In addition, during high-intensity activities like running, endocannabinoids responsible for friendly sensations, known as "runners high", are produced by the body [4].

According to the new recommendations, it is recommended that people aged 18-64 perform moderate-intensity physical activity for 150-300 minutes per week or high-intensity physical activity for 75-150 minutes. After age 65, assuming the presence of chronic diseases and disabilities, exercise is also advisable to slow down bone degenerative processes and prevent falls. However, they should be performed with greater caution, after consultation with the patient's treating physician. In contrast,

the school-age population requires an average of 60 minutes a day for exercise of moderate to high aerobic intensity [1].

Despite the many proven benefits that sports provide for general well-being, there are reasons in society for giving up physical activities. These include lack of time caused by an overload of work duties, lack of money, a deficit in the infrastructure of the location where one lives, or bad weather conditions, among others [5]. Insufficient awareness of the importance of regular physical activity is also noted among the elderly and rural communities. In rural areas, the problem is compounded by poor infrastructure that makes it difficult to make medical appointments and patient education [6]. According to WHO reports, globally, 1/3 of women and 1/4 of men do not engage in sufficient physical activity for health outcomes. In addition, in countries with higher economic status, this problem is revealed twice as often as in countries with lower status [7].

Lack of exercise becomes a risk factor for cardiovascular disease, type 2 diabetes, hypertension, obesity, osteoporosis, or cognitive dysfunction. It also correlates with predisposition to malignancies, particularly breast cancer [8,9,10,11]. In addition, diseases that could have been prevented by regular physical activity are the reason for the high cost of treatment, which is also related to the lower accessibility of doctors to patients with diseases independent of their daily habits [12].

Education on the importance and impact of physical activity on human health is recommended from an early age, as its positive effects on concentration, memory and emotions can be seen in childhood. Therefore, the values represented by the home environment as well as the school environment in this aspect are very important [13]. Thanks to organizations supported by the European Commission and lower authorities, a healthy lifestyle is promoted while taking into account the socioeconomic, or demographic, problem of the population. This occurs by raising awareness in all age groups and increasing accessibility to various sports activities [14]. Despite the many positive movements in society and the culture of body care, it is necessary to constantly monitor the state of patients' knowledge of modifiable risk factors for chronic diseases in order to prevent premature pathologies.

The purpose of this study was to assess the type of physical activity by intensity, type and duration characterizing the patients of the Rehabilitation Center in Jedlec. The results of this work will help determine the health habits pertaining to the rural population and revise the need to implement new methods of health promotion.

Material and methods:

Tabela 1. Podział respondentów ze względu na wiek i płeć.

Table 1: Division of respondents by age and gender.

Parameter analyzed			
Gender	Age group	Number	Percentage
Women	< 49 years	78	23.6%
	50-59 years	232	70.3%
	60+ years	20	6.1%
	Overall	330	100%

Men	< 49 years	50	17.7%
	50-59 years	150	53.2%
	60+ years	82	29.1%
	Overall	282	100%

The study was based on 612 patients located at a rehabilitation center for farmers in Jedlec. The division of respondents by age and gender is shown in Table 1. The study was conducted between August 2021 and September 2022. Respondents were asked to complete a proprietary questionnaire containing questions about the presence of hypertension, history of cancer, presence of musculoskeletal pain and their level of physical activity in the last 7 days before arriving at the center. The level of activity performed was assessed in terms of its intensity, type and duration. The survey questions selected for this paper are part of a more extensive study. The questionnaire consisted of single-choice and multiple-choice questions. The obtained answers were interpreted and differentiated according to sex, age and education. Calculations were performed using IBM SPSS version 29.0. $\alpha=0.05$ was used as the level of significance. A result was considered statistically significant when $p<\alpha$.

Results:

Tabela 2. Występowanie nadciśnienia tętniczego u respondentów.

Table 2. Prevalence of hypertension among respondents.

Parameter analyzed		Number	
		N	%
Hypertension	+	240	39.2%
	-	372	60.8%

Tabela 3. Występowanie dolegliwości bólowych narządu ruchu u respondentów.

Table 3 Prevalence of musculoskeletal pain among respondents.

Parameter analyzed		Number	
		N	%
Musculoskeletal pain	+	566	92.5%
	-	46	7.5%

Tabela 4. Wywiad w kierunku chorób nowotworowych u respondentów..

Table 4. History of cancer in respondents.

Parameter analyzed		Number	
		N	%
Cancer	+	26	4.3%
	-	586	95.7%

Tabela 5. Wykonywanie intensywnych czynności fizycznych w okresie ostatnich 7 dni poprzedzających przyjazd do ośrodka (n=612).

Table 5. Performing intense physical activities in the last 7 days prior to arrival at the center (n=612).

Parameter analyzed		Number	
		N	%
Women	+	126	38.2
	-	204	61.8
Men	+	86	30.5
	-	196	69.5

Tabela 6. Wykonywanie umiarkowanych czynności fizycznych w okresie ostatnich 7 dni poprzedzających przyjazd do ośrodka (n=612).

Table 6. Performing moderate physical activities in the last 7 days prior to arrival at the center (n=612).

Parameter analyzed		Number	
		N	%
Women	+	191	57.9
	-	139	42.1
Men	+	131	46.5
	-	151	53.5

Tabela 7. Jednorazowe chodzenie przez 60 minut dziennie czynności fizycznych w okresie ostatnich 7 dni poprzedzających przyjazd do ośrodka (n=612).

Table 7. Walking once for 60 minutes a day of physical activities in the last 7 days prior to arrival at the center (n=612).

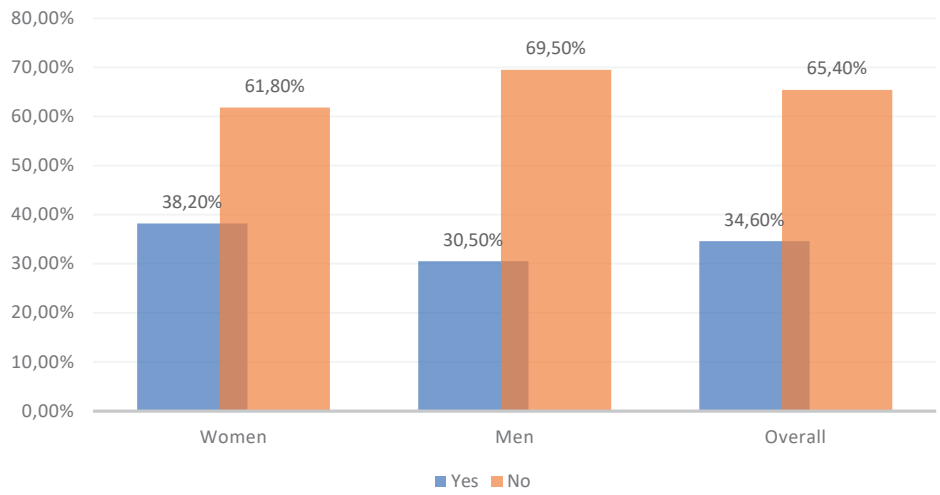
Parameter analyzed		Number	
		N	%
Women	+	185	56.1
	-	145	43.9
Men	+	149	52.8
	-	133	47.2

Tabela 8. Wykonywanie siedzących czynności fizycznych w okresie ostatnich 7 dni poprzedzających przyjazd do ośrodka (n=612).

Table 8. Leisure time sedentary behavior in the last 7 days prior to arrival at the center (n=612).

Parameter analyzed		Number	
		N	%
Women	+	150	45.5
	-	180	54.5
Men	+	106	37.6
	-	176	62.4

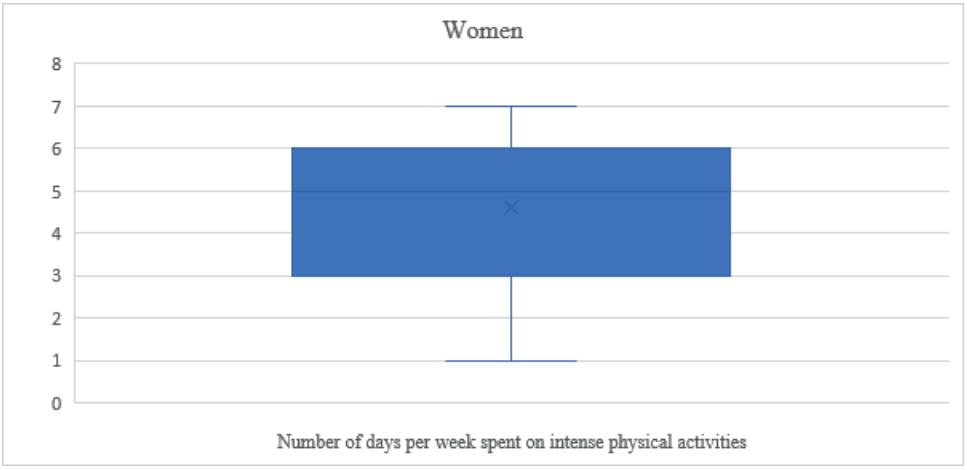
Performing intense activities in the last 7 days before arriving at the center (e.g., lifting heavy weights, heavy physical labor, digging, aerobics, fast cycling, running) was declared by 34.6% (N=212) of the surveyed individuals, while more than half of them (N=400; 65.4%) denied doing so. The percentage of women (N=126; 38.2%) who indicated that they performed intensive exercise during this period was slightly higher than that of male respondents (N=86; 30.5%) (Chart 1). A significant relationship was shown between the variables - women were more likely than men to have performed intensive physical activities in the last 7 days preceding arrival at the rehabilitation center in Jedlec ($\chi2=3.967$, df=1, p=0.046). Cramer's V coefficient is positive with weak strength (r=0.081). Intensive physical activity was performed by 41.4% of those under 49 years old, 32.7% of those between 50-59 years old and 28.4% of those over 60 years old. However, there was no statistically significant relationship between age and the variable under study (p=0.106). In addition, a significantly statistical relationship between education and the performance of intensive physical activities was also shown - as education increases, the frequency of intensive physical activities increases ($\chi2=10.692$, df=4, p=0.030). Cramer's V coefficient is an additive with weak strength (r=0.132). For BMI, there was no statistically significant relationship between this variable and intensive physical activities ($\chi2=0.729$, df=2, p=0.695). For the prevalence of hypertension, musculoskeletal pain and history of cancer there were no statistically significant association between these variables and intense physical activity (p=0.276), (p=0.111), (p=0.972) respectively.



Wykres 1. Wykonywanie intensywnych czynności fizycznych w okresie ostatnich 7 dni poprzedzających przyjazd do ośrodka w zależności od płci (n=612).

Chart 1. Performing intensive physical activities in the last 7 days prior to arrival at the center, by sex (n=612).

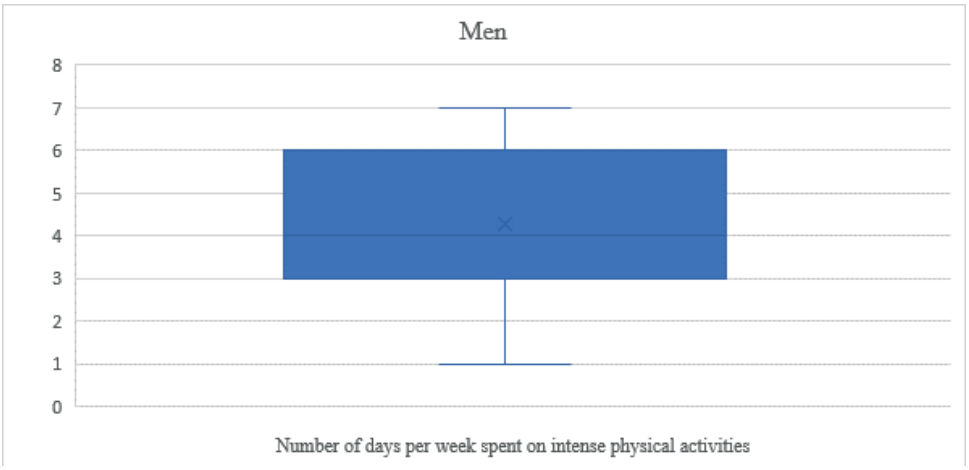
Source: author's own study.



Wykres 2. Liczba dni w tygodniu spędzonych przez kobiety na intensywnych aktywnościach fizycznych.

Chart 2. Number of days per week spent doing intense physical activities by women.

Source: author's own study.



Wykres 3. Liczba dni w tygodniu spędzonych przez mężczyzn na intensywnych aktywnościach fizycznych.

Chart 3. Number of days per week spent doing intense physical activities by men.

Source: author's own study.

On average, women (5.51±3.42) spent fewer hours per day on intensive activities compared to men (6.46 ± 3.36). The time span measured in hours in both groups ranged from 1 hour to 15 hours. The median in women was 5 hours, meaning that 50% of women spent 5 hours or more, and 50% spent 5 hours or less. In contrast, the median in men was 6 hours, meaning that 50% of men spent 6 hours or more on intensive activities during the day, and 50% spent 6 hours or less (Table 5). Women with no response who could not indicate the time they spent on these activities - 39 people, men - 25 people.

Tabela 9. Ilość czasu (dni w tygodniu, godziny i minuty dziennie) poświęconego na intensywne czynności fizyczne ze względu na płeć (n=212).

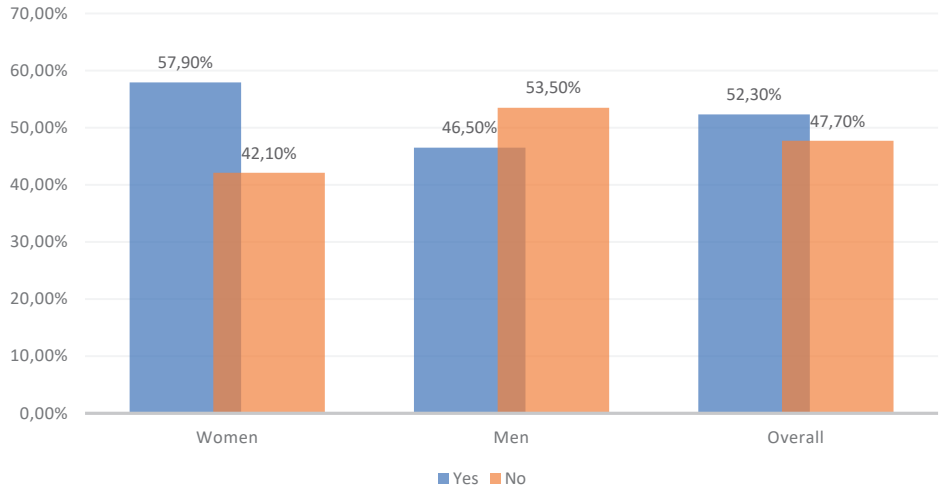
Table 9. Amount of time (days per week, hours and minutes per day) spent on intensive physical activities by sex (n=212).

Variable		N	M	SD	Me	Min	Max
Number of days per week	**Women**	126	**1,62**	**0,48**	5	1	7
	Men	86	**1,70**	**0,46**	5	1	7
Number of hours per day	**Women**	78	**5,51**	**3,42**	5	1	15
	Men	56	**6,46**	**3,36**	6	1	15
Number of minutes per day	**Women**	9	**31,11**	**8,20**	30,0	15,0	45,0
	Men	5	**28,0**	**4,47**	30,0	20,0	30,0

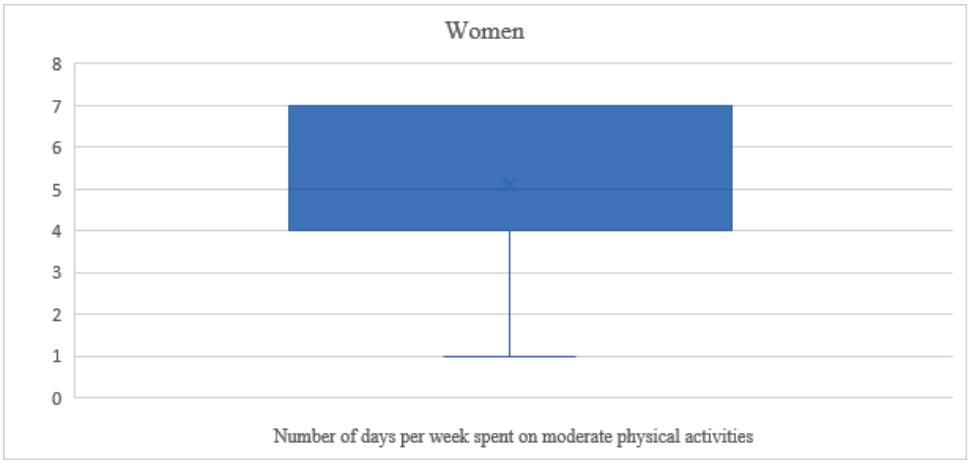
N - number of observations, M - arithmetic mean, SD - standard deviation, Me - median, Min - minimum value, Max - maximum value.

Source: author's own study.

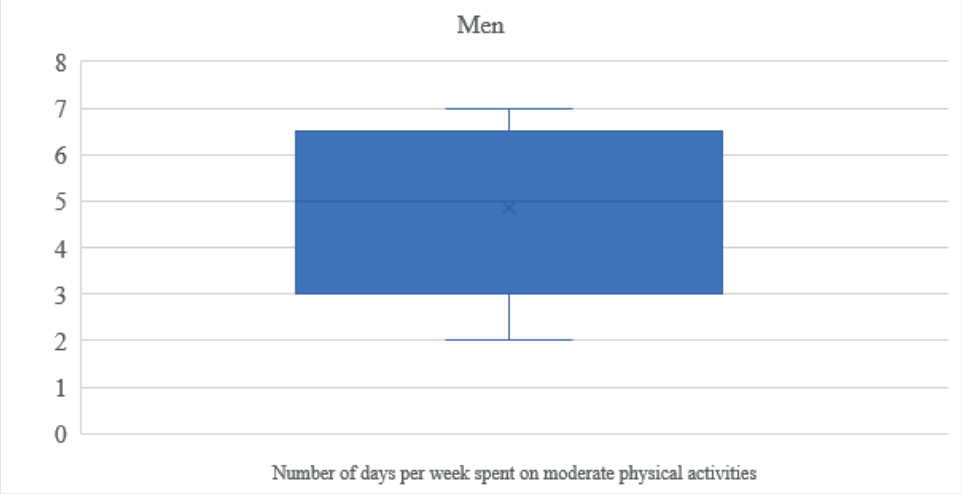
Performing moderate activities in the last 7 days before arriving at the center (e.g., lifting lighter weights, cycling at a normal pace, housework, light household chores) was declared by 52.3% (N=320) of those surveyed, while 47.7% (N=292) did not indicate performing the mentioned activities. The percentage of women (N=191; 57.9%) indicating that they performed these activities was higher than the percentage of men (N=129; 46.5%). A significant relationship was shown between the variables - women were more likely than men to have performed moderate physical activities in the last 7 days preceding arrival at the rehabilitation center in Jedlec ($\chi2=8.974$, df=1, p=0.003). Cramer's V coefficient is positive with weak strength (r=0.121) (Chart 4). Moderate physical activity was performed by 57% of those under 49 years old, 51% of those between 50-59 years old and 44.1% of those over 60 years old. However, there was no statistically significant relationship between age and the variable under study (p=0.198). In addition, a significantly statistical relationship between education and the performance of moderate physical activities was also shown - as education increases, the frequency of moderate physical activities increases ($\chi2=17.002$, df=4, p=0.002). Cramer's V coefficient is additive with weak strength (r=0.167). For BMI, there was no statistically significant association between this variable and moderate physical activities ($\chi2=1.647$, df=2, p=0.439). For the prevalence of hypertension, musculoskeletal pain and history of cancer there were no statistically significant association between these variables and moderate physical activity (p=0.384), (p=0.499), (p=0.366) respectively.



Wykres 4. Wykonywanie umiarkowanych czynności fizycznych w zależności od płci (n=612).
Chart 4. Performing moderate physical activities by sex (n=612).
Source: author's own study.



Wykres 5. Liczba dni w tygodniu poświęcanych przez kobiety na umiarkowaną aktywność fizyczną.
Chart 5. Number of days per week spent on moderate physical activities by women.
Source: author's own study.



Wykres 6. Liczba dni w tygodniu poświęcanych przez mężczyzn na umiarkowaną aktywność fizyczną.

Chart 6. Number of days per week spent on moderate physical activities by men.

Source: author's own study.

On average, women (4.87±3.29) spent more hours per day on moderate activities compared to men (4.55± 3.06). The time span measured in hours in women ranged from 1 hour to 14 hours, while in men it ranged from 1 hour to 12 hours. The median in both men and women was 4 hours, meaning that 50% of women and men spent 4 hours or more on moderate activities during the day, and 50% spent 4 hours or less (Table 6). For the number of hours and minutes, 64 women and 48 men were unable to provide these data.

Tabela 10. Ilość czasu (dni w tygodniu, godziny i minuty dziennie) poświęconego na umiarkowane czynności fizyczne ze względu na płeć (n=320).

Table 10. Amount of time (days per week, hours and minutes per day) spent on moderate physical activities by sex (n=320).

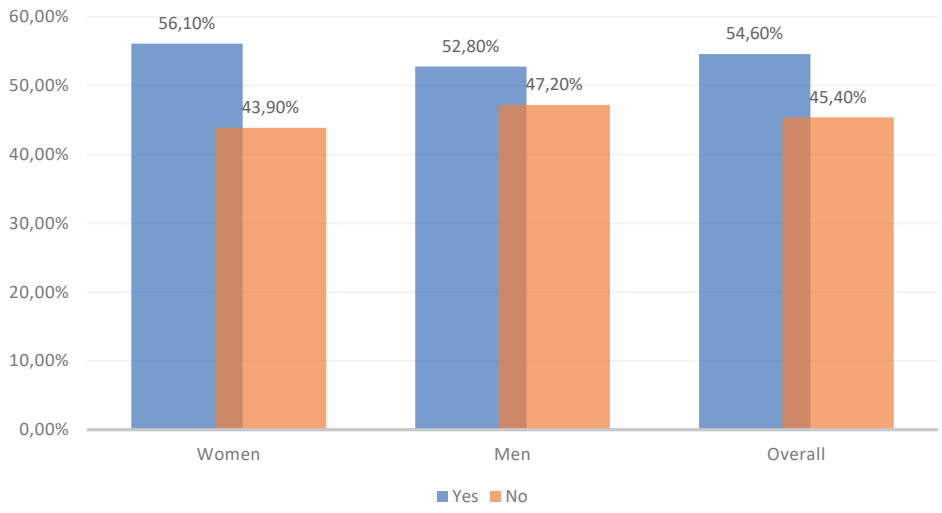
Variable		N	M	SD	Me	Min	Max
Number of days per week	**Women**	191	**5,14**	**1,98**	6,0	1	7
	Men	129	**4,40**	**1,99**	4,5	1	7
Number of hours per day	**Women**	114	**4,87**	**3,29**	4,0	1	14
	Men	73	**4,55**	**3,06**	4,0	1	12
Number of minutes per day	**Women**	13	**27,31**	**16,02**	30,0	10,0	75,0
	Men	8	**26,88**	**10,32**	30,0	5,0	40,0

N - number of observations, M - arithmetic mean, SD - standard deviation, Me - median, Min - minimum value, Max - maximum value.

Source: author's own study.

In the case of walking for at least 60 minutes a day at a time, this is where 54.6% (N=334) declared themselves, while 45.4% (N=278) of people indicated that they had not walked that much time in the last 7 days before coming to the center. The percentage of women indicating this type of activity was 56.1% (N=185), while men were 52.8% (N=149) (Chart 7). There was no statistically significant association between men and women for the activity of walking for 60 minutes at a time

during the day (χ2=0.505, df=1, p=0.477). No such relationship also occurred between BMI and the variable in question (χ2=1.330, df=2, p=0.514). Walking for at least 60 minutes a day at a time was performed by 61.7% of those under 49 years old, 52.4% of those between 50-59 years old and 55.9% of those over 60 years old. However, there was no statistically significant relationship between age and the variable under study (p=0.094). On the other hand, there was a significantly statistical relationship between education and the described variable - as the level of education increased, the frequency of performing a single activity for at least 60 minutes increased (χ2=19.387, df=4, p=0.001). Cramer's V coefficient is additive with weak strength (r=0.178). For the prevalence of hypertension and history of cancer there were no statistically significant association between these variables and walking for 60 minutes at a time during the day (p=0.761), (p=0.92) respectively. However, there was a significantly statistical relationship between the prevalence of musculoskeletal pain and walking for 60 minutes at a time (p=0.028).



Wykres 7. Jednorazowe chodzenie przez 60 minut dziennie w zależności od płci (n=612).
Chart 7. Walking for 60 minutes a day at a time, by sex (n=612).
Source: author's own study.

On average, women (5.31±3.65) spent more hours per day walking more than 60 minutes at least once compared to men (4.71±1.95). In women, the minimum time spent on this activity was 1 hour, while the maximum was 17 hours. In contrast, in men, the minimum time was 1 hour, while the maximum time was 16 hours. The median in both men and women was 4 hours, meaning that 50% of women and men performed these activities for 4 hours or less, and 50% for 4 hours or more (Table 7). 109 people could not indicate the number of hours and minutes per day - 67 women and 42 men.

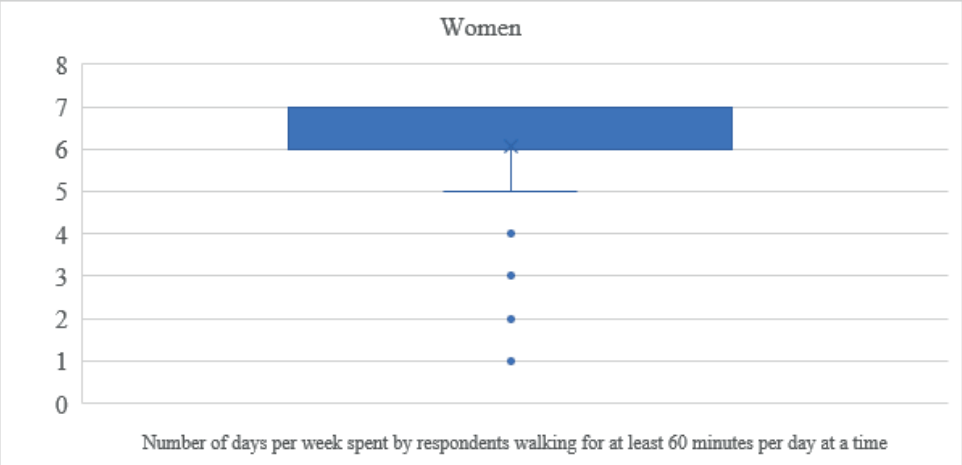
Tabela 11. Ilość dni w tygodniu poświęconych przez respondentów na jednorazowe chodzenie przez co najmniej 60 minut dziennie w zależności od płci (n=334).

Table 11. Number of days per week spent by respondents walking for at least 60 minutes per day at a time, by sex (n=334).

Variable		N	M	SD	Me	Min	Max
Number of days per week	**Women**	185	**6,05**	**1,55**	7,0	1,0	7,0
	Men	149	**5,32**	**1,95**	6,0	1,0	7,0
Number of hours per day	**Women**	114	**5,31**	**3,65**	4,0	1,0	17,0
	Men	103	**4,71**	**3,48**	4,0	1,0	16,0
Number of minutes per day	**Women**	5	**58,0**	**32,71**	30,0	20,0	90,0
	Men	3	**33,33**	**5,77**	30,0	30,0	40,0

N - number of observations, M - arithmetic mean, SD - standard deviation, Me - median, Min - minimum value, Max - maximum value.

Source: author's own study.



Wykres 8. Liczba dni w tygodniu, w których respondenci spacerują przez co najmniej 60 minut dziennie - kobiety.

Chart 8. Number of days per week spent by respondents walking for at least 60 minutes per day at a time, by women.

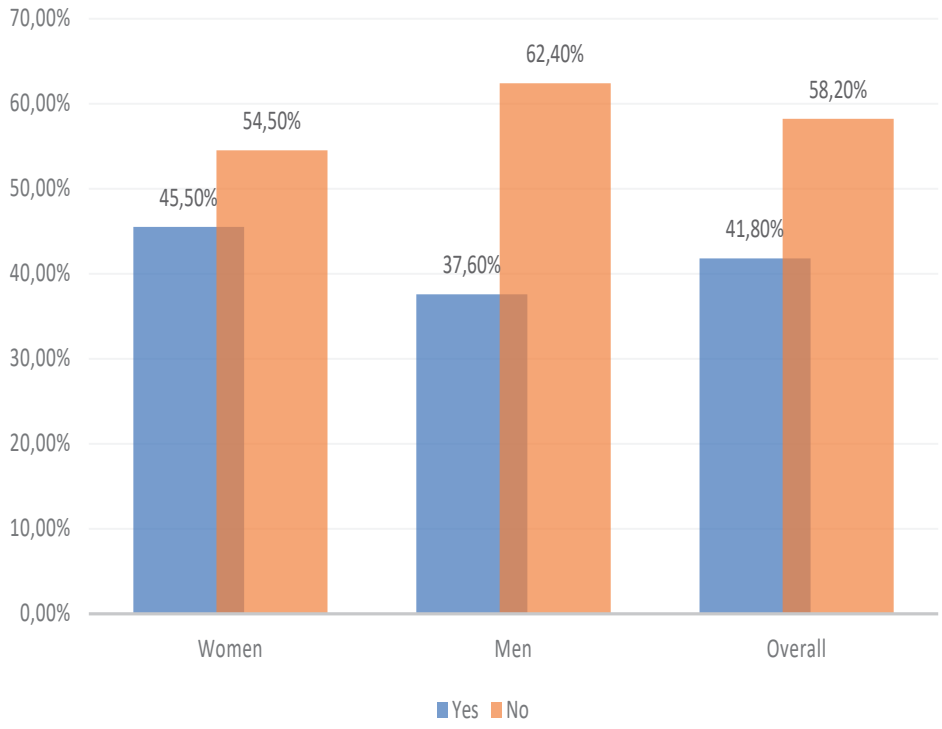
Source: author's own study.

Wykres 9. Liczba dni w tygodniu, w których respondenci spacerują przez co najmniej 60 minut dziennie - mężczyźni.

Chart 9. Number of days per week spent by respondents walking for at least 60 minutes per day at a time, by men.

Source: author's own study.

Those who declared how much time they spent in the last week before coming to the rehabilitation center doing leisure time sedentary behavior such as sitting at a desk, visiting friends, reading or watching TV accounted for 41.8% (N=256) of respondents. More than half of them (N=356; 58.2%) could not indicate how long these activities took them. The percentage of women (N=150; 45.5%) able to specify this time was higher than the percentage of men (N=106; 37.6%) who also did (Chart 10). No statistically significant relationship was shown between BMI level ($\chi2=0.251$, df=2, p=0.882), age ($\chi2=0.265$, df=2, p=0.876) and leisure time sedentary behavior. A statistically significant association was shown between gender and leisure time sedentary behavior ($\chi2=0.386$, df=1, p=0.049). Women (58.6%) were more likely to have performed leisure time sedentary behavior in the last 7 days before coming to the center than male respondents (41.4%). In addition, a statistically significant relationship was also shown between the education of the subjects and this type of activity ($\chi2=31.481$, df=4, p=0.001). Those with vocational education (43.0%) were more likely to spend time on leisure time sedentary behavior than those with primary (7.0%), secondary (37.9%), postsecondary (5.9%) and higher education (6.3%).



Wykres 10. Siedząca aktywność respondentów w zależności od płci (n=612).
Chart 10. Leisure time sedentary behavior of respondents by sex (n=612).
Source: author's own study.

On average, women (2.81±2.09) spent fewer hours per day on leisure time sedentary behavior compared to men (3.05± 2.12) in the last 7 days before coming to the center. The minimum time reported by women and men was 1 hour, the maximum was 12 hours. The median in women and men was 2 hours, meaning that 50% of women spent 2 hours or more on leisure time sedentary behavior during the day, and 50% spent 2 hours or less. In contrast, the median value in men was 3 hours (Table 8).

Tabela 12. Czas poświęcony na siedzące aktywności w zależności od płci (n=256).
Table 12. Time spent on leisure time sedentary behavior by sex (n=256).

Variable		N	M	SD	Me	Min	Max
Number of hours per day	**Women**	145	**2,81**	**2,09**	2,0	1	12
	Men	105	**3,05**	**2,12**	3,0	1	12
Number of minutes per day	**Women**	5	**26,0**	**8,94**	30,0	10,0	30,0
	Men	1	**30,0**	**0,0**	30,0	30,0	30,0

N - number of observations, M - arithmetic mean, SD - standard deviation, Me - median, Min - minimum value, Max - maximum value.

Source: author's own study.

Discussion:

Only 34.6% of the respondents had engaged in intense physical activity (e.g. lifting heavy objects) in the seven days prior to arrival at the centre. For moderate activity such as cycling at normal pace, the percentage was higher at 52.3%. The work of Rowiński R i wsp. [15] describes that a form of moderate activity such as gardening was carried out by 53.4% of men and 34.7% of women, however, the age range of the respondents was 65-85+. Walking for a minimum of 60 minutes at a time was performed by 54.6% of patients. In addition, leisure time sedentary behavior was performed by 41.8% of the subjects. This is particularly significant as some sources report that the percentage of physically inactive people living in rural areas is 31.7% [16]. Nowadays, people are increasingly leading sedentary lifestyles. This is due, among other things, to office work and excessive use of cell phones [17]. According to the studies, about 27.5% of the global adult population does not meet the criteria for the recommended amount of physical activity [18]. Physical exertion is significantly associated with life satisfaction, quality of life and feelings of happiness [19,20,21]. In addition, higher levels of physical activity are associated with delayed cognitive impairment and dementia [22,23]. Our study found that women were more likely than men to perform intense and moderate physical activities (p=0.046), (p=0.003) respectively. Furthermore, we observed that for the above levels of physical exertion, higher education was associated with more frequent activity (p=0.03), (p=0.002) respectively. This is also confirmed by other authors studying the behavior and habits of rural populations [24]. Interestingly, those with vocational education performed statistically more frequently (p=0.001) leisure time sedentary behavior compared to those with other education. In addition, leisure time sedentary behavior were also more frequently performed by women (p=0.049). In the study Azevedo M. et al. [25] found that higher socioeconomic status was positively correlated with exercise nevertheless, it was statistically more often performed by men. Also in the studies Biernat E. et al. [24] and Ignasiak Z. et al. [26] men were more likely to engage in physical activity than women. Different results were obtained by Wang J. et al. [27], in his work, the prevalence of sedentary lifestyles and low levels of physical activity characterized men with a high education. Nevertheless, the type of physical activity studied may influence the results of the work along with statistical relationships [28].

It is worthy observation that in our study, despite the fact that women performed intense, moderate physical activities and leisure time sedentary behavior more often, only in the case of moderate activities did they perform them summed longer. In addition, the summed time of walking for 60 minutes at a time was also performed longer by the female sex and was positively correlated with the level of education (p=0.001). Owino V. et al. [29] stresses that with age, muscle mass decreases, which can lead to an increased risk of falls. This is a particularly important issue because each year there are about 37.3 million falls requiring medical intervention, and the simplest method of prevention is sports [30]. In addition, in the meta-analysis Xu Q. et al. [31] it has been observed that falls are more common among older people with lower levels of education and who use stimulants such as alcohol or tobacco. Another interesting report is the paper of Bielemann R. et al. [32] which revealed that physical activity is inversely correlated with the phenomenon of polypragmasy. This is especially important in an era of increasing multimorbidity in the elderly, which can be counteracted to some extent by lifestyle changes. The problem will become increasingly

acute, as the GUS forecasts predicts that in 2050 Poland's population of people over 60 will increase compared to 2020 by 26.6% [33].

Our data indicates that the presence of hypertension among the subjects does not affect any physical activity. Similar results emerged in the research conducted by Iwai N. et al. [34], which reveals that the level of leisure-time physical activity was not associated with the use of antihypertensive drugs. Additionally, our analysis shows correlation between musculoskeletal pain and walking for 60 minutes at a time. Our study also found that the age of the respondents did not correlate with the frequency of physical activity. Contrary results were reported in several publications that also studied populations living in different regions of Poland in which physical activity decreased with age [15,16,26,35]. Obesity or overweight can be quite a hindrance to starting regular exercise. Confirmation comes from studies showing that people with higher BMIs are less likely to do physical activity [36,37]. In contrast, in our study, we did not observe a statistically significant relationship between BMI and any level of physical activity.

Conclusions:

The study assessed the level of physical activity in the perspective of chronic diseases in a rural Polish population. The frequency of performing intense and moderate physical activity at the level of 34.6% and 52.3% respectively, is objectively insufficient. Nevertheless, the results indicate that women are more likely than men to implement physical activity into their daily lives. We found that the incidence of musculoskeletal pain statistically significantly correlates with walking a minimum of 60 minutes at a time. Moreover, in the study population, hypertension had no impact on engaging in any physical activity. The research also proves an interesting phenomenon, namely that the BMI level is not related to the subjects' exercise intake. Therefore, it is important for health care professionals especially nursing staff to impart medical knowledge and encourage changes in negative habits. This will not only improve nursing procedures, but also build a sense of responsibility for one's health, which is extremely important in the therapeutic process.

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