Health Prob Civil. 2025, Volume 19, Issue 2
ORIGINAL PAPER ISSN 2353-6942, eISSN 2354-0265

PHYSICAL ACTIVITY AND THE QUALITY OF LIFE IN THE PHYSICAL DIMENSION OF RESPONDENTS FROM INDEPENDENT CULTURE CENTERS IN POLAND

Michał Bergier[1(A,B,C,D,E,F)]

[1]Department of Tourism and Recreation, John Paul II University in Biała Podlaska, Poland

Authors' contribution:
A. Study design/planning
B. Data collection/entry
C. Data analysis/statistics
D. Data interpretation
E. Preparation of manuscript
F. Literature analysis/search
G. Funds collection

Summary

Background. The aim of the study was to investigate the potential relationship between physical activity and quality of life of people representing Independent Culture Centers (ICC). It is probably the first scientific article addressing the issue of people from such a niche group as ICC members and examining their physical activity and quality of life.
Material and methods. The study group consisted of 104 people (38 women and 66 men), aged 19 to 46, members of ICC located in Poland. The level of physical activity of the respondents was examined using the International Physical Activity Questionnaire (IPAQ). The quality of life in the physical dimension was assessed using the 36-Short Form Health Survey questionnaire (SF36v2).
Results. Even though in each of the analyzed levels of physical activity intensity differences were demonstrated between respondents from the compared groups of people with different levels of quality of life, in none of the analyzed cases was a statistically significant differentiation demonstrated.
Conclusions. The results obtained by the research ICC respondents are unusual in light of previous research related to the issue under consideration. Therefore, further research is needed among ICC members, which would help indicate what a relationship is there between physical activity and quality of life.

Keywords: Independent Culture Centers, SF36v2, IPAQ, physical activity, quality of life

Introduction

Physical activity is one of the most important aspects of health prevention for entire populations. The fact has been confirmed by the latest research results [1-5]. Inappropriate diet, lack of recommended physical activity, or simple convenience make lifestyle diseases one of the main threats to human health and life [6-8]. According to research, the above-mentioned neglect may result in a phenomenon called hypokinesia (lack of movement), which may then result in premature death [9,10]. Thus, regular physical activity can be an excellent health prevention method [11-16]. Physical activity is being increasingly referred to as an interdisciplinary issue concerning the quality of life [17-21]. The authors of the publications consider the concept based on various fields of science, as well as in relation to various socio-professional groups [22-29].

Tables: 5
Figures: 0
References: 45
Submitted: 2024 Nov 22
Accepted: 2025 Feb 11
Published Online: 2025 Feb 25

Bergier M. Physical activity and the quality of life in the physical dimension of respondents from Independent Culture Centers in Poland. Health Prob Civil. 2025; 19(2): 226-236. https://doi.org/10.5114/hpc.2025.147768

Address for correspondence: Michał Bergier, Department of Tourism and Recreation, John Paul II University in Biała Podlaska, Sidorska 95/97, 21-500 Biała Podlaska, Poland, e-mail: m.bergier@dyd.akademiabialska.pl, phone: +48 83 344 99 00, https://orcid.org/0000-0003-3407-1504

Aim of the work

The aim of the conducted research and analyses was to demonstrate the alleged relationships between the level of physical activity and the quality of life in the physical dimension occurring in people from Independent Culture Centers (ICC) located in Poland.

In connection with the formulated research objective, the following research questions were asked:

1. Are people with a higher level of quality of life in the physical dimension more physically active, as compared to those with a lower level of quality of life in the physical dimension?
2. At what levels of physical activity intensity is there a difference between respondents with higher and lower levels of quality of life in the physical dimension?

Research hypotheses were formulated for the presented research questions:

1. People with a higher level of quality of life in the physical dimension are more active, as compared to those with a lower level of quality of life in the physical dimension.
2. All levels of physical activity intensity show a difference between respondents with higher and lower levels of quality of life in the physical dimension in favor of the former group.

Material and methods

Characteristics of the study group

The research was conducted among people from niche groups operating as associations forming the ICC in Poland, at the headquarters of individual organizations located in: Warsaw, Lublin, Wrocław and Gliwice.

Individual centers have been operating for 2 to 11 years. Their common feature is that they are non-governmental organizations operating in a grassroots manner on the Do It Yourself (DIY) principle.

Participation in the study was declared by 112 people. Correctly completed questionnaires were received from 104 people and the number of respondents was included in the statistical analyses.

The relatively small number of people studied results from the niche nature of the group. It should be emphasized that the author made every effort to ensure that the research process concerned as many people from ICC as possible. This is confirmed by the fact that the research was conducted directly, on dates previously established and suggested by the respondents themselves. The research was conducted during weekly organizational meetings of ICC, where important issues from the respondents' perspective regarding the initiatives they implement are raised and discussed. As reported by the research participants, the meetings bring together the vast majority of their members, which is related to the importance of the topics discussed at the aforementioned meetings.

The criterion for inclusion in the study was being an active member of one of the above-mentioned centers. Due to the small number of ICC members, resulting from their specificity, it can be assumed with great probability that almost all people actively involved in such places in Poland were examined. It is confirmed by the fact that each group was examined directly, during visits to ICC. The people taking part in the study were previously informed about the study, and the researchers adjusted to the research date proposed by the respondents.

The study group consisted of 38 women and 66 men aged 19 to 46 (29.0±5.3 years). Women were younger (26.5±4.7 years) than men (30.5±5.2 years) (Table 1). The above-mentioned diversity of the group is typical for non-profit organizations. It results from the so-called voluntary nature of membership and the criterion

of selecting individuals not based on age or gender, but on creativity, inventiveness and willingness to engage in initiatives undertaken in individual centers.

During the research, biometric data of respondents were obtained, which were based on the respondents' declarations. The mean body height (BH) of the study participants was 177.3±9.8 cm, including 167±5.3 cm in women and 183.2±6.2 cm in men. The mean body mass (BM) was 69.9±12.6 kg; 54.6±5.1 kg in women, and 78.7±4.6 kg in men, respectively. The mean BMI value was within the WHO norm (12) in most of the study participants and was 22.0±2.4 kg/m^2, including 19.6±1.9 kg/m^2 in women and 23.5±1.2 kg/m^2 in men (Table 1).

Table 1. Average level and variability of selected biometric indicators of the respondents

Variable	Group	n	$\bar{x}$	SD	Min	Max
AG [years]	Total	104	29.0	5.3	19.0	46.0
	Women	38	26.5	4.7	21.0	45.0
	Men	66	30.5	5.2	19.0	46.0
BH [cm]	Total	104	177.3	9.8	160.0	196.0
	Women	38	167.0	5.3	160.0	190.0
	Men	66	183.2	6.2	170.0	196.0
BM [kg]	Total	104	69.9	12.6	45.0	87.0
	Women	38	54.6	5.1	45.0	65.0
	Men	66	78.7	4.6	70.0	87.0
BMI [kg/m^2]	Total	104	22.0	2.4	16.5	26.5
	Women	38	19.6	1.9	16.5	24.2
	Men	66	23.5	1.2	20.8	26.5

Notes: n – number of cases, $\bar{x}$ – arithmetic mean, SD – standard deviation, Min – minimum score, Max – maximum score, AG – age, BH – body height, BM – body mass, BMI – body mass index.

Research methods

Physical activity

The physical activity of the respondents was assessed using the International Physical Activity Questionnaire (IPAQ) in its short version [30-31]. The selection of the aforementioned questionnaire was preceded by an analysis of the scientific literature describing its validity and reliability [32]. According to reports, the IPAQ questionnaire is considered to be the best validated and most frequently used in recent years. It has also been used in representative population studies covering 20 countries [33].

The tool allowed for the collection of information on professional and communicative physical activity undertaken at home and around the home, as well as recreational physical activity of respondents in the seven days preceding the survey. The questions included in the questionnaire concerned activities that required intense physical effort, moderate effort, walking, and sedentary behaviors. Only aerobic efforts lasting continuously for at least 10 minutes were taken into account. The final result of self-assessment of weekly physical activity volume was expressed in METmin/week.

Quality of life

The Polish version of the Short Form Health Survey, version 2 (SF36v2) was used to assess the quality of life in the physical dimension. It is a revised and improved version of the SF36 questionnaire [34].

The surveyed ICC members performed a self-assessment of indicators (subscales) of their quality of life in the Physical Component Scores (PCS), which include: physical functioning (PF), role limitations due to physical reasons (RP), pain complaints (BP), and general health (GH). The answers provided by the respondents were transformed and normalized to a scale of 0-100 points in accordance with the recommendations of the Polish version of the questionnaire [34].

The results were then interpreted as based on the population norm set at 50 points. The final result was presented as a quality of life index concerning physical health, which is the sum of points from the assessed subscales. The study was conducted in accordance with the instructions included in the guide to studies conducted using SF36v2 [34].

The obtained results allowed the division of respondents into two groups, distinguished on the basis of the results obtained on a scale of 0-100. The first group consisted of people with a lower level of PCS (≤Me PCS – 60.3 points), the second group consisted of respondents with a higher level of quality of life in the physical dimension (>Me PCS – 60.3 points).

It should be emphasized that the popularity of the questionnaire is confirmed by the number of citations, it amounted to as many as 2060 items in 1988-2000 [35], and the breakthrough was 1996, when after 10 years of using the SF36, a new, improved and improved version of the questionnaire (SF36v2) was created [34]. Studies aimed at verifying the new version showed that it is characterized by a higher degree of reliability [36].

The use of the SF36v2 questionnaire in combination with physical activity questionnaires allowed for the illustration of the alleged relationship between physical activity and the quality of life in the physical dimension of the respondents.

Statistical analysis

During the analyses of physical activity, the most useful nonparametric statistical methods were used. The significance of differences between the studied variables for independent samples was determined by the Mann–Whitney U test, which is an equivalent of the classic Student's t-test for unrelated samples. The studies were made on the basis of analyses in Statistica 12.0.

Results

In order to demonstrate the relationship between physical activity and quality of life in the physical dimension, the study participants were divided into dichotomous groups, the first of which (I) showed a lower level of PCS and the second (II) a higher one (Table 2).

Based on the statistical analyses performed, no significant differences were found between vigorous physical activity (VPA) undertaken by people with lower and higher levels of quality of life in the physical dimension.

It is worth noting, however, that despite the lack of significant differences, more favorable results were observed in the indicators of the frequency of undertaking physical activity at a high-intensity level in the group of respondents with a higher level of quality of life in the physical dimension, as compared to those with a low level (3.9±1.8 days/week vs. 3.4±1.7 days/week). However, the difference was statistically insignificant (p=0.310) (Table 2).

Similar results were shown in the analysis of daily VPA participation (46.9±18.5 min/day vs. 41.8±23.4 min/day). The difference was also statistically insignificant (p=0.057) (Table 2).

More favorable results of group II were also demonstrated by analyses of weekly energy expenditure associated with high-intensity exercises (1325.1±691.7 METmin/week vs. 1084.3±671.4 METmin/week). However, the difference was not statistically significant (p=0.074) (Table 2).

Table 2. Variation in the level of high-intensity physical activity in groups of people distinguished by the level of PCS

Variable	Group	n	$\bar{x}$	SD	∑R	U	p
VPA [days/week]	**I**	46	3.4	1.7	2029.5	948.5	0.310
	II	47	3.9	1.8	2341.5		
VPA [min/day]	**I**	46	41.8	23.4	1913.5	832.5	0.057
	II	47	46.9	18.5	2457.5		
VPA [min/week]	**I**	46	135.5	83.9	1929.0	848.0	0.074
	II	47	165.6	86.5	2442.0		
VPA [METmin/week]	**I**	46	1084.3	671.4	1929.0	848.0	0.074
	II	47	1325.1	691.7	2442.0		

Notes: n – number of cases, x̄ – arithmetic mean, SD – standard deviation, ∑R – sum of ranks, U – value of the Mann-Whitney test, p – test probability level for U, VPA – vigorous physical activity (8.0 METs), I – lower level of quality of life in the physical dimension (≤Me PCS – 60.3 points), II – higher level of quality of life in the physical dimension (>Me PCS – 60.3 points).

The statistical analyses performed did not show any significant differences in the case of moderate physical activity (MPA) undertaken by both groups. It should be noted, however, that the respondents from the first group achieved more favorable results in the daily (56.7±24.5 min/day vs. 51.4±28.5 min/day) and weekly (211.7±137.2 min/week vs. 200.8±132.1 min/week) volume of the type of effort. However, the differences were statistically insignificant, p=0.101 and p=0.642, respectively (Table 3).

Group II slightly (p=0.631) outperformed only in the frequency of MPA (4.2±2.2 days/week vs. 4.0±1.9 days/week) (Table 3). Group I also achieved slightly (p=0.642) more favorable results in the analysis of weekly energy expenditure associated with MPA (846.8±548.7 METmin/week vs. 803.3±528.3 METmin/week) (Table 3).

Table 3. Variation in the level of MPA in groups of people distinguished by the level of PCS

Variable	Group	n	$\bar{x}$	SD	∑R	U	p
MPA [days/week]	**I**	47	4.0	1.9	2078.5	950.5	0.631
	II	43	4.2	2.2	2016.5		
MPA [min/day]	**I**	47	56.7	24.5	2342.0	807.0	0.101
	II	43	51.4	28.5	1753.0		
MPA [min/week]	**I**	47	211.7	137.2	2196.5	952.5	0.642
	II	43	200.8	132.1	1898.5		
MPA [METmin/week]	**I**	47	846.8	548.7	2196.5	952.5	0.642
	II	43	803.3	528.3	1898.5		

Notes: n – number of cases, x̄ – arithmetic mean, SD – standard deviation, ∑R – sum of ranks, U – value of the Mann-Whitney test, p – test probability level for U, MPA – moderate physical activity (4.0 METs), I – lower level of quality of life in the physical dimension (≤Me PCS – 60.3 points), II – higher level of quality of life in the physical dimension (>Me PCS – 60.3 points).

Analyses of light intensity physical activity (LPA) also did not reveal any statistically significant differences between LPA groups I and II.

It is worth noting, however, that the first group achieved more favorable results in the daily and weekly volume of the type of effort (67.6±38.8 min/day vs. 63±32.9 min/day and 412.2±279.6 min/week vs. 400.9±216.1 min/week, respectively). However, the differences were statistically insignificant (p=0.778 and p=0.762, respectively) (Table 4).

The second group had a slight (p=0.674) advantage in the analysis of the frequency of taking antipsychotics (6.2±1.5 days/week vs. 6.1±1.7 days/week) (Table 4).

More favorable results of group I were also obtained from the analysis of weekly energy expenditure associated with LPA (1360.1±922.6 METmin/week vs. 1323.0±713.3 METmin/week). The differences shown (p=0.762) were, however, statistically insignificant (Table 4).

Table 4. Differences in the level of LPA in groups of people distinguished according to the level of PCS

Variable	Group	n	$\bar{x}$	SD	∑R	U	*p*
LPA [days/week]	**I**	51	6.1	1.7	2538.5	1212.5	0.674
	II	50	6.2	1.5	2612.5		
LPA [min/day]	**I**	51	67.6	38.8	2643.0	1233.0	0.778
	II	50	63.0	32.9	2508.0		
LPA [min/week]	**I**	51	412.2	279.6	2556.0	1230.0	0.762
	II	50	400.9	216.1	2595.0		
LPA [METmin/ week]	**I**	51	1360.1	922.6	2556.0	1230.0	0.762
	II	50	1323.0	713.3	2595.0		

Notes: n – number of cases, $\bar{x}$ – arithmetic mean, SD – standard deviation, ∑R – sum of ranks, U – value of the Mann-Whitney test, p –test probability level for U, LPA – light intensity physical activity (3.3 METs), I – lower level of quality of life in the physical dimension (≤Me PCS – 60.3 points), II – higher level of quality of life in the physical dimension (>Me PCS – 60.3 points).

Analyses of total physical activity (TPA) of both groups did not show statistically significant differences. However, it should be noted that slightly (p=0.648) more favorable results were shown in people with a lower level of quality of life in the physical dimension, both in the average frequency of TPA during the day (157.6±61.3 min/day vs. 148.3±60.8 min/day) and during the week (729.5±371.1 min/week vs. 715.0±321.1 min/week) (Table 5).

The respondents from the group representing a higher PCS level achieved a slightly (p=0.609) more favorable result in the average energy cost per total PA (3195.5±1367.3 METmin/week vs 3118.5±1548.7 METmin/week) (Table 5).

Table 5. Differences in the level of physical activity and sitting in groups of people distinguished according to the level of PCS

Variable	Group	n	$\bar{x}$	SD	∑R	U	*p*
TPA [min/day]	**I**	51	157.6	61.3	2735.5	1191.5	0.468
	II	51	148.3	60.8	2517.5		
TPA [min/week]	**I**	51	729.5	371.1	2594.5	1268.5	0.833
	II	51	715.0	321.1	2658.5		

Variable	Group	n	$\bar{x}$	SD	∑R	U	*p*
TPA [METmin/ week]	I	51	3118.5	1548.7	2549.5	1223.5	0.609
	II	51	3195.5	1367.3	2703.5		
SIT [min/day]	I	47	390.6	160.0	2491.5	1080.5	0.323
	II	52	357.0	156.1	2458.5		

Notes: n – number of cases, $\bar{x}$ – arithmetic mean, SD – standard deviation, ∑R – sum of ranks, U – value of the Mann-Whitney test, *p* – test probability level for U, TPA – total physical activity, SIT – sitting, I – lower level of quality of life in the physical dimension (≤Me PCS – 60.3 points), II – higher level of quality of life in the physical dimension (>Me PCS – 60.3 points).

Discussion

The aim of the study was to demonstrate the alleged relationships between the level of physical activity and the quality of life in the physical dimension among people from ICC located in Poland.

Based on the statistical analyses conducted, no significant differences were found between physical activity undertaken by people with lower and higher levels of quality of life in the physical dimension.

The difficulty in comparing the results of this research with the results of other researchers is the unusual, or even niche, nature of the respondents forming ICC. The result obtained by the respondents from ICC is unusual in the light of previous studies related to the issue under consideration. The vast majority demonstrate a positive correlation between physical activity and quality of life [17-21].

The obtained results may indicate that it is difficult to clearly determine what the relationship between quality of life and physical activity is, because it probably depends on the specificity of the studied group. They may also be an inspiration to conduct further research among such groups using other research tools and methods, with particular emphasis on objective methods. It may be confirmed by the results of studies by various authors conducted in groups of similar age (to the respondents from ICC) described below.

According to the analyses by Çiçek [37], comparing a group of students from sports fields with students from other fields, physical activity may have a positive impact on the quality of life. The author proved that the self-assessment of the quality of life of the respondents increases with the intensity of the undertaken physical activity. Nowak [38] reached similar conclusions. In the studies by Balboa-Castillo [39], it was shown that the quality of life increases with the increase in the low-intensity physical activity undertaken by the respondents. Studies on women during menopause conducted by Naworska [40] showed a correlation between high levels of physical activity and quality of life. Similar results were shown by Bădicu [41].

The most frequently published studies related to the analysis of the impact of physical activity on quality of life are certainly studies conducted among respondents with various types of health problems [42-45]. However, it seems that it would be a mistake to compare the results shown in studies of such groups with healthy respondents. Therefore, further studies are needed among various socio-demographic groups, which would help to indicate the actual relationship between physical activity and quality of life.

Conclusions

Based on the conducted research and analyses, it was found that the answers to the formulated research questions were negative in each case.

The research hypotheses were not confirmed either, the first of which assumed that respondents with a higher level of quality of life in the physical dimension are more physically active, as compared to those with a lower level of quality of life in the physical dimension, and the second, that all levels of physical activity show differences between respondents with a higher and lower level of quality of life in the physical dimension in favor of the first group. It should be emphasized at the same time that the results of the conducted research illustrate a certain tendency indicating that individuals with a higher PCS are more physically active. The fact is an inspiration to conduct further, in-depth studies among people from ICC.

The data analyses performed allow us to draw the following conclusions:

- In none of the analyzed cases was there any significant difference between the physical activity of respondents from groups characterized by a higher and lower level of quality of life in the physical dimension.
- The demonstrated, statistically insignificant differences may be an inspiration to conduct further, in-depth research using objective methods and tools for examining physical activity levels, such as accelerometers.
- The conducted research should be expanded in the future to include analyses of the relationship between physical activity and the quality of life in the mental dimension.

Disclosures and acknowledgements

The work uses material from an author's doctoral dissertation entitled "Physical activity of women and men from ICC in the context of pro-health recommendations and self-assessment of quality of life".

The author declares no conflicts of interest with respect to the research, authorship, and/or publication of this article.

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

The beginning of the research process was preceded by obtaining the consent of the University Bioethics Committee for Scientific Research at the Jerzy Kukuczka Academy of Physical Education in Katowice on 13th December 2012 (resolution no. 2/2012).

Artificial intelligence (AI) was not used in the creation of the manuscript.

References:

1. Donnelly S, Penny K, Kynn M. The effectiveness of physical activity interventions in improving higher education students' mental health: a systematic review. Health Promot Int. 2024; 39(2): daae027. https://doi.org/10.1093/heapro/daae027
2. Zhu S, Sinha D, Kirk M, Michalopoulou M, Hajizadeh A, Wren G, et al. Effectiveness of behavioural interventions with motivational interviewing on physical activity outcomes in adults: systematic review and meta-analysis. BMJ. 2024; 386: e078713. https://doi.org/10.1136/bmj-2023-078713
3. Andersen LL. Health promotion and chronic disease prevention at the workplace. Annu Rev Public Health. 2024; 45(1):337-357. https://doi.org/10.1146/annurev-publhealth-060222-035619
4. Seydoux C, Regina J, de La Harpe R, Dévaud M, Oestreicher S, Grand C, et al. [Promoting physical activity in everyday life: the role of health care professionals]. Rev Med Suisse. 2024; 20(896): 2181-2185 (in French). https://doi.org/10.1016/j.jamda.2023.12.006

5. Makino K, Raina P, Griffith LE, Lee S, Harada K, Katayama O, et al. Lifetime physical activity and late-life mild cognitive impairment in community-dwelling older adults. J Am Med Dir Assoc. 2024; 25(3): 488-493.e3.
6. Rizzoli R, Chevalley T. Nutrition and osteoporosis prevention. Curr Osteoporos Rep. 2024; 22(6): 515-522. https://doi.org/10.1007/s11914-024-00892-0
7. Lin L, Hu Y, Lei F, Huang X, Zhang X, Sun T, et al. Cardiovascular health and cancer mortality: evidence from US NHANES and UK Biobank cohort studies. BMC Med. 2024; 22(1): 368. https://doi.org/10.1186/s12916-024-03553-2
8. Tsoi A, Gomez A, Boström C, Pezzella D, Chow JW, Girard-Guyonvarc'h C, et al. Efficacy of lifestyle interventions in the management of systemic lupus erythematosus: a systematic review of the literature. Rheumatol Int. 2024; 44(5): 765-778. https://doi.org/10.1007/s00296-024-05548-x
9. Jodkowska M, Tabak I, Oblacińska A, Stelmach M. Sedentary behaviour 13-years olds and its association with selected health behaviours, parenting practices and body mass. Medycyna Wieku Rozwojowego. 2013; 17(2): 165-173.
10. Kruk J. Health and economic costs of physical inactivity. Asian Pacific Journal of Cancer Prevention. 2014; 15: 7499-7503. https://doi.org/10.7314/APJCP.2014.15.18.7499
11. Szigethy M, Nagyváradi K, Heszteráné Ekler J, Ihász F. Relationship between spinal column health and physical activity among schoolchildren aged 12-13. Health Prob Civil. 2024; 18(3): 310-319. https://doi.org/10.5114/hpc.2024.134276
12. Marszałek A, Walaszek R, Kasperczyk T. Physical activity as a form of support for emotional intelligence in the treatment of depressive disorders: a review of current studies. Health Prob Civil. 2024; 18(1): 62-71. https://doi.org/10.5114/hpc.2023.132014
13. Hasson R, Sallis JF, Coleman N, Kaushal N, Nocera VG, Keith N. COVID-19: implications for physical activity, health disparities, and health equity. Am J Lifestyle Med. 2021; 16(4): 420-433. https://doi.org/10.1177/15598276211029222
14. Jakubowska L, Grabowska B, Seń M. Physical activity, health condition and lifestyle of academic youth. Journal of Education Culture and Society. 2019; 10(2): 201-215, https://doi.org/10.15503/jecs20192.201.215
15. Urzeala C, Popescu V, Courteix D, Teodorescu S. Barriers and facilitators for the romanian older adults in enjoying physical activity health-related benefits. Sustainability. 2021; 13(22): 12511. https://doi.org/10.3390/su132212511
16. Liu Z, Kemperman A, Timmermans H. Influence of neighborhood characteristics on physical activity, health, and quality of life of older adults: a path analysis. Front Public Health. 2021; 9: 783510. https://doi.org/10.3389/fpubh.2021.783510
17. Sun M, Liu C, Lu Y, Zhu F, Li H, Lu Q. Effects of physical activity on quality of life, anxiety and depression in breast cancer survivors: a systematic review and meta-analysis. Asian Nurs Res (Korean Soc Nurs Sci). 2023; 17(5): 276-285. https://doi.org/10.1016/j.anr.2023.11.001
18. Agussalim NQ, Ahmad M, Prihantono P, Usman AN, Rafiah S, Agustin DI. Physical activity and quality of life in breast cancer survivors. Breast Dis. 2024; 43(1): 161-171. https://doi.org/10.3233/BD-249005
19. de Oliveira LDS, Souza EC, Rodrigues RAS, Fett CA, Piva AB. The effects of physical activity on anxiety, depression, and quality of life in elderly people living in the community. Trends Psychiatry Psychother. 2019; 41(1): 36-42. https://doi.org/10.1590/2237-6089-2017-0129

20. Saridi M, Filippopoulou T, Tzitzikos G, Sarafis P, Souliotis K, Karakatsani D. Correlating physical activity and quality of life of healthcare workers. BMC Res Notes. 2019; 12(1): 208. https://doi.org/10.1186/s13104-019-4240-1
21. Liao YH, Kao TW, Peng TC, Chang YW. Gender differences in the association between physical activity and health-related quality of life among community-dwelling elders. Aging Clin Exp Res. 2021; 33(4): 901-908. https://doi.org/10.1007/s40520-020-01597-x
22. Esteban C, Ortiz-Rodz DI, Muñiz-Pérez YI, Ramírez-Vega L, Jiménez-Ricaurte C, Mattei-Torres E, et al. Quality of life and psychosocial well-being among intersex-identifying individuals in Puerto Rico: an exploratory study. Int J Environ Res Public Health. 2023; 20(4): 2899. https://doi.org/10.3390/ijerph20042899
23. Wdowiak A, Anusiewicz A, Bakalczuk G, Raczkiewicz D, Janczyk P, Makara-Studzińska M. Assessment of quality of life in infertility treated women in Poland. Int J Environ Res Public Health. 2021; 18(8): 4275. https://doi.org/10.3390/ijerph18084275
24. Sze HLH, Fung CLB, Cheung PPP, Chim TYA, Lee MH, Law CCC, et al. Cross-cultural validation of health and quality of life measures for children in Hong Kong. Occup Ther Int. 2022; 2022: 5672679. https://doi.org/10.1155/2022/5672679
25. Caron V, Jeanneret N, Giroux M, Guerrero L, Ouimet M, Forgeot d'Arc B, et al. Sociocultural context and autistics' quality of life: a comparison between Québec and France. Autism. 2022; 26(4): 900-913. https://doi.org/10.1177/13623613211035229
26. Ghazy RM, Abubakar Fiidow O, Abdullah FSA, Elbarazi I, Ismail II, Alqutub ST, et al. Quality of life among health care workers in Arab countries 2 years after COVID-19 pandemic. Front Public Health. 2022; 10: 917128. https://doi.org/10.3389/fpubh.2022.917128
27. Băjenaru L, Balog A, Dobre C, Drăghici R, Prada GI. Latent profile analysis for quality of life in older patients. BMC Geriatr. 2022; 22(1): 848. https://doi.org/10.1186/s12877-022-03518-1
28. Lu J, Zhang N, Wang Y. Quality of life among different types of Chinese lonely elderly: a social isolation based analysis. Psychol Health Med. 2022; 27(6): 1357-1365. https://doi.org/10.1080/13548506.2021.1883072
29. Su Y, Liu MS, De Silva PV, Østbye T, Jin KZ. Health-related quality of life in Chinese workers: a systematic review and meta-analysis. Glob Health Res Policy. 2021; 6(1): 29. https://doi.org/10.1186/s41256-021-00209-z
30. Biernat E, Stupnicki R, Gajewski AK. [International Physical Activity Questionnaire (IPAQ) – Polish version]. Wychowanie Fizyczne i Sport. 2007; 51(1): 47-54 (in Polish).
31. Biernat E. [Physical activity of Warsaw residents on the example of selected professional groups]. Warszawa: SGH; 2011 (in Polish).
32. van Poppel MNM, Chinapaw MJM, Mokkink LB, van Mechelen WV, Terwee CB. Physical activity questionnaires for adults: a systematic review of measurement properties. Sports Medicine (Auckland, N.Z.). 2010; 40(7): 565-600. https://doi.org/10.2165/11531930-000000000-00000
33. Bauman AE, Craig CL, Ainsworth BE, Sallis JF, Hagströmer M, Bull FC, et al. The descriptive epidemiology of sitting. A 20-country comparison using the International Physical Activity Questionnaire (IPAQ). American Journal of Preventive Medicine. 2011; 41(2): 228-235. https://doi.org/10.1016/j.amepre.2011.05.003

34. Żołnierczyk-Zreda D, Wrześniewski K, Bugajska J, Jędryka-Góral A. [Polish version of the questionnaire for the study of health-related quality of life. Questionnaire manual]. Warszawa: CIOP-PIB; 2009 (in Polish).
35. Turner-Bowker DM, Bartley PJ, Ware JE Jr. SF-36 Health Survey & "SF" bibliography: third edition (1988-2000). Lincoln: Quality Metric Incorporated; 2002.
36. Ware JE, Kosinski M, Dewey JE. Introduction. In: Ware JE, Kosinski M, Dewey JE, editors. How to score version 2 of the SF-36 Health Survey (Standard and Acute forms). Lincoln: Quality Metric Incorporation; 2002.
37. Çiçek G. Quality of life and physical activity among university students. Universal Journal of Educational Research. 2018; 6(6): 1141-1148. https://doi.org/10.13189/ujer.2018.060602
38. Nowak PF, Bożek A, Blukacz M. Physical activity, sedentary behavior, and quality of life among university students. Biomed Res Int. 2019; 2019: 9791281. https://doi.org/10.1155/2019/9791281
39. Balboa-Castillo T, León-Muñoz LM, Graciani A, Rodríguez-Artalejo F, Guallar-Castillón P. Longitudinal association of physical activity and sedentary behavior during leisure time with health-related quality of life in community-dwelling older adults. Health Qual Life Outcomes. 2011; 9: 47. https://doi.org/10.1186/1477-7525-9-47
40. Naworska B, Brzęk A, Dąbrowska-Galas M, Drosdzol-Cop A, Skrzypulec-Plinta V, Marcisz C, et al. Physical activity level and quality of life in menopausal women. Annales Academiae Medicae Silesiensis. 2018; 72: 27-30. https://doi.org/10.18794/aams/75133
41. Bădicu G. Physical activity and health-related quality of life in adults from Braşov, Romania. Education Sciences. 2018; 8(2): 52. https://doi.org/10.3390/educsci8020052
42. Fontes KP, Veiga DF, Naldoni AC, Sabino-Neto M, Ferreira LM. Physical activity, functional ability, and quality of life after breast cancer surgery. J Plast Reconstr Aesthet Surg. 2019; 72(3): 394-400. https://doi.org/10.1016/j.bjps.2018.10.029
43. Abrantes LCS, de Souza de Morais N, Gonçalves VSS, Ribeiro SAV, de Oliveira Sediyama CMN, do Carmo Castro Franceschini S, et al. Physical activity and quality of life among college students without comorbidities for cardiometabolic diseases: systematic review and meta-analysis. Qual Life Res. 2022; 31(7): 1933-1962. https://doi.org/10.1007/s11136-021-03035-5
44. Sivas F, Moran M, Yurdakul F, Ulucaköy Koçak R, Başkan B, Bodur H. Physical activity, musculoskeletal disorders, sleep, depression, and quality of life before and after bariatric surgery. Turkish Journal of Physical Medicine and Rehabilitation. 2020; 66(3): 281-290. https://doi.org/10.5606/tftrd.2020.3694
45. Kucukvardar D, Karadibak D, Ozsoy I, Atag Akyurek E, Yavuzsen T. Factors influencing physical activity in patients with colorectal cancer. Ir J Med Sci. 2021; 190: 539-546. https://doi.org/10.1007/s11845-020-02338-9