Leisure time physical activity among employed and unemployed women in Poland

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Objective/Background: The aim of the paper was to investigate the leisure time physical activity (LTPA) among Polish employed and unemployed women in light of meeting the World Health Organisation (WHO) recommendations and analysed its relationship with employment status. The concept of personal responsibility for a healthy lifestyle plays in the modern times a crucial role here and is an integral part of the prevention process (including the necessity for LTPA).

Methods: A sample (n=527) of Polish women was surveyed by the long form of International Physical Activity Questionnaire (IPAQ-LF), with statistically significant differences between variables (intensity and duration of the activity vs. employment status), in the model being verified by chi-square testing. Multi-variable logistic regression analysis was performed to find the relationship between socio-demographic criteria and the amount of exercise recommended by WHO. The relationship between LTPA and the amount of exercise recommended by WHO was assessed using the log-linear analysis.

Results: Over one-third of the respondents did not engage in any LTPA (employed = 38.6 and unemployed = 36.6%). Employed women engaged in vigorous exercises more often (18.2%) than those who were unemployed (5.8%). The amount of LTPA undertaken by the majority of respondents (58.7% employed and 65.2% unemployed) was not sufficient to maintain their health owing to lack of walking, moderate and vigorous LTPA.

Conclusion: Polish women nowadays (regardless of whether they are employed or not) still do not engage in a sufficient amount of LTPA to maintain their health. Intervention programme in both groups is needed.

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Introduction

Gender are determinant factors in undertaking physical activity in leisure time (Miller & Brown, 2005; Rutkowska & Bergier, 2015). The gender bias defines typically masculine and feminine activities, which has a detrimental effect on women’s engagement in sports during their leisure time. Apart from work and household management, women, regardless of their age, marital status, education level, income, place of residence, type of work and (subjectively evaluated) physical fitness level, are less likely to devote their time to sports and recreation (Brown, Mishra, Lee, & Bauman, 2000; Henderson & Hickerson, 2007; Lyson, 2013). Furthermore, women are found to prefer different types of physical activities (Taniguchi & Shupe, 2014) and spend much less time in physical training than men (Eoley, 2005).

However, it is noticeable that modern times bring changes into women’s lives. In developing societies, it is the most educated, working and urban women who are moving ahead to achieve a status equal to their male counterparts (Khan, 2011). These women are those who do not perceive gender, familial or social restrictions as constraints (Henderson & Hickerson, 2007). However, working women usually have role conflicts—they have to be a full-time worker and homemaker, which might lead to depression and interpersonal conflicts (Hoshino, Amano, Suzuki, & Suwa, 2016). Moreover, the picture of women with poor education, poverty and living in rural areas still reflects their subjugation (Khan, 2011). Owing to more attractive and better-paid jobs, higher socioeconomic status, better education, living either single or in a relationship in which their partners share family responsibilities, women appear to be more independent. They have fewer restrictions in their choices. The concept of self-management plays a crucial role here and is an integral part of the prevention process (including the needs of exercise).

Due to significant societal changes, it is expected that health promoting behaviours among women will also change. This, in turn, yields the need for further research in the area of women’s physical activity. Their way of spending leisure time is particularly important from the societal point of view. A previous study shows that only about 15% of their energy consumption is spent on leisure activities, while about 85% is spent on non-leisure activities (LaMonte, 2008). According to the European Social Survey, a staggering 57.5% of European females do not undertake any physical activity (this include housework and gardening) (ESS, 2012). In Poland, the percentage of inactive women is even greater. Leisure time physical activity (LTPA) of at least moderate intensity (MVPA) is taken up by 61.2% of the women in a national survey (Biernat, 2013). This questionnaire allows the analysis of physical activity in different areas of everyday life, i.e. at work, communication, housework, sports and recreation.

To fulfill the methodological requirements, several procedures have been implemented. Firstly, the full survey was preceded by a pilot (n = 12), which confirmed the correctness of the sampling procedure and intelligibility of the questionnaire. Secondly, the sampling procedure included not only the first-best respondents, but also the substitute respondents of identical characteristics (sex, age, municipality) that were included in the sample in case of refusal. Refusal rate was negligible (<1%, n = 8). After three attempts to contact respondents with no responses, they were immediately replaced with the substitute respondents.

The interviews were conducted by trained interviewers who delivered the questionnaire in a simple and standardized way. The Polish version of the International Physical Activity Questionnaire (IPAQ) was used as a research tool (Biernat, 2013). This questionnaire allows the analysis of physical activity in different areas of everyday life, i.e. at work, communication, housework, sports and recreation.

In this study, only data from the domain of leisure-time physical activity were used. Respondents above 15 years old (n = 527) were asked to give the following information regarding their physical activity in the leisure time during the last 7 days:

- vigorous physical activity (i.e. aerobic activity, running, fast cycling, fast swimming),
Leisure time physical activity among Polish women

- moderate physical activity (i.e. cycling at a regular pace, swimming at a regular pace, tennis),
- walking continuously for at least 10 min (not counting walking to and from work).

For the collected data, average energy expenditure of each activity (MET-min/week) was calculated by multiplying the MET assigned to it (vigorous — 8 MET, moderate — 4 MET, walking — 3.3 MET) by the number of days of performance during a week, where MET corresponds to oxygen consumption during rest and equals to 3.5 ml O₂/kg of body mass per minute (Ainsworth et al., 2011).

The authors followed the IPAQ Research Committee guidelines on data cleaning and processing. In cases with "don’t know"/"refused" or where time or day were missing in the data, the case was removed from analysis. Outliers were excluded in all cases where cumulative total time of walking and overall moderate activity were greater than 960 min (16 h/day). The group of women who reported 0 days per week in all types of activity was considered as inactive.

The sample consisted of 527 participants. Detailed characteristics of participants can be found in Table 1.

Data analysis procedure

The statistical analyses were run in IBM® SPSS® Statistics, version 21. The descriptive statistical analysis was used for the characteristics of the dependent variables in terms of Mean (X), Standard Deviation (SD±) and Medians (Me). The Kolmogorov—Smirnov test was used to verify if the data were normally distributed (the verified variables included vigorous and moderate physical activity and walking, in MET-min/week). Since the assumption of normality for given dependent variables was violated (alpha level at 0.05), a non-parametric test (U-Mann Whitney) was used for further analysis. In order to investigate the differences between the types and duration of physical activities undertaken by women with different work status, the Chi² test was used (p < 0.05). Multi-variable logistic regression analysis was performed to find out the relationship between socio-demographic variables (age, education, income, place of residence and employment status) and the amount of exercise recommended by the World Health Organization (WHO) (moderate physical activity ≥150 min/week or vigorous physical activity ≥75 min/week, or the equivalent combination of moderate and vigorous activity) (WHO, 2010). The relationship between physical activity undertaken by participants and the amount of exercise recommended by the WHO was assessed using log-linear analysis. The strength of the relationship was expressed by the odds ratio (OR) with 95% confidence interval.

Results

The results show that over one-third (37.8%) of the respondents (n = 527) did not engage in any physical activity in their leisure time. Among those Polish women who were physically active in their free time, 53.5% undertook walking, 20.3% engaged in moderate and 12.9% in vigorous physical activity (Table 2).

A multivariable logistic regression was performed to predict meeting WHO recommendations by taking up adequate dose of LTPA from selected socio-demographic criteria (age, education, income, professional status, place of residence). Although the analysis showed that the model was statistically significant (Wald z = 27.3; p < 0.001), the "pseudo" R estimates indicated that it explained between 14.2% (Cox & Shell R²) and 19.2% (Nagelkerke R²). The only significant predictors were age (Wald z = 12.0; p < 0.05) and professional status (Wald z = 19.7; p < 0.05). However, 15–29-year-old women are the odds of meeting the WHO recommendations 3.2 higher than in the group of those over 60 years old (Wald z = 5.1; p < 0.05). This study has been confirmed by

| Table 1 | Characteristics of the population (n = 527). |
|---------|------------------------------------------|
| Factors | Employed (n = 303) | Unemployed (n = 224) | Total (n = 527) |
| Age     | n  | %  | n  | %  | n  | %  |
| 15–29 years old | 84 | 27.7 | 26 | 11.6 | 110 | 20.9 |
| 30–39 years old | 65 | 21.5 | 31 | 13.8 | 96 | 18.2 |
| 40–49 years old | 63 | 20.8 | 13 | 5.8 | 76 | 14.4 |
| 50–59 years old | 55 | 18.2 | 33 | 14.7 | 88 | 16.7 |
| >60 years old | 36 | 11.9 | 121 | 54.0 | 157 | 29.8 |
| Education | | | | | |
| Primary | 63 | 20.8 | 43 | 19.2 | 106 | 20.1 |
| Vocational secondary | 64 | 21.1 | 60 | 26.8 | 124 | 23.5 |
| Secondary | 117 | 38.6 | 98 | 43.8 | 215 | 40.8 |
| Higher | 59 | 19.5 | 23 | 10.3 | 82 | 15.6 |
| Average monthly gross income (per capita in household) | | | | |
| <490 USD | 55 | 18.2 | 95 | 42.4 | 150 | 28.5 |
| 491–735 USD | 80 | 26.4 | 68 | 30.4 | 148 | 28.1 |
| 736–1100 USD | 103 | 34.0 | 39 | 17.4 | 142 | 26.9 |
| >1101 USD | 65 | 21.5 | 22 | 9.8 | 87 | 16.5 |
numerous authors so far. As far as professional status is concerned, the unemployed women were 3.3 less likely to meeting WHO recommendations (Wald $z = 4.7; p < 0.001$) than the other groups. Therefore, the authors found it crucial to investigate intensity, frequency and duration of their LTPA in comparison with the employed ones.

Employed women engaged in vigorous exercise more often (18.2%) than those who were unemployed (5.8%) ($\chi^2 = 17.5, p < 0.001$).

The analysis of the frequency and duration of undertaken physical activities did not yield significant differences between employed and unemployed Polish women when vigorous activity and walking were considered (Table 3). The majority of employed women declared that they engaged in vigorous activities lasting less than 75 min (78.2%) 1–2 times per week (54.5%), whereas those in the unemployed group exercised vigorously 1–2 and 3–5 times per week (38.5% each) for up to 75 min (53.8%). Employed women declared walking 1–2 times per week (46.1%) for up to 75 min (69.5%), and unemployed women walked 3–5 times per week (37.5%) for less than 75 min (70.3%).

However, there was a significant difference between the groups of respondents when the frequency of moderate physical activity was taken into account ($\chi^2 = 14.1,$ $p < 0.001$).

| Leisure physical activity | Employed (n = 303) | Unemployed (n = 224) | $p^a$ | Total (n = 527) |
|--------------------------|--------------------|---------------------|------|----------------|
| Vigorous PA              |                    |                     |      |                |
| Frequency (times per week) | 1–2                | 30 (54.5)          | 5 (38.5) | 0.12             | 35 (51.5) |
|                          | 3–5                | 22 (40.0)          | 5 (38.5) | 27 (39.7)      |
|                          | $>5$               | 3 (5.5)            | 3 (23.1) | 6 (8.8)         |
| Duration (min/week)      | $<75$              | 43 (78.2)          | 7 (53.8) | 0.197           | 50 (75.3) |
|                          | 75–149             | 9 (16.4)           | 4 (30.8) | 13 (19.1)      |
|                          | 150–299            | 3 (5.5)            | 2 (15.4) | 5 (7.4)         |
|                          | $\geq 300$         | —                  | —       | —              |
| Moderate PA              |                    |                     |      |                |
| Frequency (times per week) | 1–2                | 37 (53.6)          | 10 (26.3) | 0.001***       | 47 (43.9) |
|                          | 3–5                | 29 (42.0)          | 18 (47.4) | 47 (43.9)     |
|                          | $>5$               | 3 (4.3)            | 10 (26.3) | 13 (12.1)     |
| Duration (min/week)      | $<75$              | 49 (71.0)          | 30 (78.9) | 0.579           | 79 (73.8) |
|                          | 75–149             | 17 (24.6)          | 6 (15.8) | 23 (21.5)     |
|                          | 150–299            | 3 (4.3)            | 2 (5.3) | 5 (4.7)         |
|                          | $\geq 300$         | —                  | —       | —              |
| Walking                  |                    |                     |      |                |
| Frequency (times per week) | 1–2                | 71 (46.1)          | 44 (34.4) | 0.092           | 115 (40.8) |
|                          | 3–5                | 53 (34.4)          | 48 (37.5) | 101 (35.8)    |
|                          | $>5$               | 30 (19.5)          | 36 (28.1) | 66 (23.4)     |
| Duration (min/week)      | $<75$              | 107 (69.5)         | 90 (70.3) | 0.354           | 197 (69.9) |
|                          | 75–149             | 41 (26.6)          | 29 (22.7) | 70 (24.8)     |
|                          | 150–299            | 6 (3.9)            | 7 (5.5) | 13 (4.6)        |
|                          | $\geq 300$         | —                  | 2 (1.6) | 2 (0.7)         |

PA — Physical activity.

**Significant differences ($p < 0.05$) employed vs. unemployed.

$***p < 0.001$.

$^a$ Scores were computed between the two groups using Chi$^2$ test.
scores were computed between the two groups using U-Mann Whitney test.

Table 4  Mean (X) standard deviation (±SD) and medians (Me) of physical activity (MET-min/week) undertaken by Polish women in their leisure time (n = 527).

| MET-min/week  | Employed       | Unemployed    | p*      | Total         |
|---------------|----------------|---------------|---------|---------------|
|               | X ± SD (Me)    | X ± SD (Me)   |         | X ± SD (Me)   |
| Vigorous PA   | 305.2 ± 1506.0 (0)* | 168.9 ± 991.0 (0) | 0.001*** | 247.3 ± 1312.7 (0) |
| Moderate PA   | 153.2 ± 403.4 (0) | 185.3 ± 556.1 (0) | 0.21    | 166.8 ± 474.1 (0) |
| Walking       | 431.4 ± 916.4* (99.0) | 589.6 ± 997.1 (198.0) | 0.032*  | 498.7 ± 953.8 (148.0) |
| Total         | 889.9 ± 1835.3 (396.0) | 943.8 ± 1783.8 (396.0) | 0.951   | 912.8 ± 1812.1 (396.0) |

PA = Physical activity.

*p < 0.05.

**p < 0.001.

a Scores were computed between the two groups using U-Mann Whitney test.

p < 0.001). It appears that more employed women engaged in activity of this intensity 1–2 times per week (53.6%) than those who were unemployed (26.3%). However, the former group rarely undertook moderate exercise >5 times per week (4.3%) unlike the latter group (26.3%).

The analysis of the average energy expenditure of the leisure time physical activity for Polish women (MET-min/week) yielded significant differences between the investigated groups of respondents for vigorous activity and walking (Table 4). As previously shown, the frequency and duration of these two types of physical activities did not differ significantly between the two groups of respondents (Table 3). The average energy expenditure for vigorous exercise was higher for the employed than unemployed women (305.2 ± 1506.0 MET-min/week and 168.9 ± 991.0 MET-min/week, respectively; U = 29849.0, p < 0.001). The opposite pattern was observed for walking (employed: 431.4 ± 916.4; unemployed: 589.6 ± 997.1 MET-min/week).

Based on the frequency, duration and MET-min/week for all three levels of physical activity intensities, it was possible to predict if the women taking part in the study are able to achieve the WHO (2010) recommended amount of physical activity by engaging in sports in their leisure time alone. The results show that 65.2% unemployed and 58.7% employed women fail to meet these recommendations (>150 min/week of moderate PA or ≥75 min/week of vigorous PA, or the equivalent combination of both). As shown in Table 5, this depends on the dependent factors: if a woman does not take walking as her activity, the risk of not being active at all for this woman increases 8-fold (OR = 0.119) (85.3% of women who do not declare walking as their activity do not meet WHO recommendations). Lack of engagement in moderate physical activity decreases the chance of meeting WHO norms 13-fold (OR = 0.075) (72.9 and 27.1%, respectively). However, women who engage in vigorous physical activities increase this chance 37-fold (OR = 0.027) (94.1%).

Discussion

When modern Polish women are put in the spotlight, it appears that they are in control of their lives; competent and professional in their careers and family lives (Kamińska-Wcisło, 2015). They are keen on professional development, which is the result of their internal need for growth, self-development and acquisition of new skills, rather than solely due to the requirements of their jobs. This shows that they are ambitious, determined and independent (Kamińska-Wcisło, 2015). Although it is harder for them to be employed on the same salary conditions as men (European Commission, 2014), they create a picture of a woman who is open to new opportunities and free in her choices.

Physical activity for women, just like for men, is an important part of health and recreation (Henderson & Hickerson, 2007). However, women seem to engage less systematically in regular physical activity and their main motivation is the improvement of physical appearance (57%), rather than health benefits (10%) (Alejziak, 2011). It should be mentioned that physical activity is more frequent as far as young people are concerned (Zanesco & Antunes, 2007). Scientists point out that awareness of the role of physical activity in the prevention and treatment of various conditions is on the increase among middle-aged women (Nowak, 2011). It is shown that participation in any form of physical activity is characteristic of highly educated women who live in big cities and have a high social and economic status (Guimaraes & Baptista, 2013; Kwaśniewska, Kaleta, Dziankowska-Zaborszczyk, Drygas, & Makowiec-Dąbrowska, 2007).

The results of this study show that employed women engage in vigorous physical activities more often (18.2%) than those who are unemployed (5.8%) (p < 0.001), which is in line with the findings of Eyler et al. (2002). For general leisure, longer sitting times were reported by women, smokers and those without full-time employment. This phenomenon may be due to the fact that women who have sedentary jobs trying to compensate for a lack of physical activity at work with increased activity during their leisure time, although, as pointed out by Jans, Proper, and Hildebrandt (2007), this is not always the case. Another explanation might be that working women have more responsibilities and less free time. This would lead to an increase in exercise intensity so that the recommended amount of physical activity is met. Alternatively, the obtained pattern of findings may be associated with the rather dynamic lifestyle led by women who are working. Research shows that vigorous physical activity is declared mostly by the women who are extremely healthy (24–27%), compared to those of poor health (4–6%) and women whose
BMI is normal (16–26%) rather than high (22–11%) (Evenson et al., 2002). It should be highlighted that engaging in such activities in adolescence is of great importance: it has a significant impact on undertaking moderate physical activity or walking in the adulthood (Adams-Campbell et al., 2000).

Engagement in vigorous exercise increased the possibility of meeting the recommended physical activity amount 37-fold (OR = 0.027), whereas the lack of moderate activity increased the risk of inactivity 13-fold (OR = 0.075) (8-fold for lack of walking (OR = 0.119)). The researchers would like to highlight that sufficient LTPA is crucial in preventing the metabolic syndrome (MetSyn). Non-physically active women are at high risk of MetSyn across all OCPA groups (Jans et al., 2007), particularly if they have a sedentary job (Mozumdar & Liguori, 2011).

Therefore, not only is the type of activity important, but the duration, frequency and intensity of the physical activity should be analysed. Previous work by Nowak drew attention to the differences in leisure time activities between working and permanently passive Polish women (Nowak, 2011). Among the employed, 50.0% had exercised for 7 years or longer, 55.0%: 4–7 years, 55.7%: 1–4 years and 59.4% one year. Among permanently passive ones, these numbers are as follows: 29.8; 23.1; 17.7; 18.1%, respectively.

The results of the frequency of undertaken physical activity (both vigorous activity and walking) did not show significant differences between employed and unemployed women. Vigorous exercise was undertaken 1–2 times per week (51.5%), 3–5 times per week (39.7%) and 5 times per week (8.8%). For comparison, 21.2% of women are vigorously active (>20 min/day >3 days/week) according to 2003 BRFSS (Delfine, 2007). Similarly, the NHIS reported that 23% of women engage in vigorous LTPA 3 days/week for ≥10 min (Delfine, 2007).

Although according to previous studies, walking is the most popular form of activity among women (particularly those with lower fitness level) (Guimarães & Baptista, 2013), only 40% of Polish women declared undertaking walking as their leisure physical activity 1–2 times per week, nearly 36% 3–5 times per week and just over 23% walked more than 5 times per week. It is very likely that Polish women included in the declared amount of walking walks with their children, which may have an impact on future activity. When the child grows up, the LTPA and overall level of PA may automatically decrease (Brune & Chad, 2013), however, it have to be proved by in-depth analyses. In northern European countries (such as Finland, Sweden and Ireland) engaging in walking nearly fulfils the overall amount of physical activity recommended by WHO (30 min of daily exercise) (Sjöström, Oja, Hagströmer, Smith, & Bauman, 2006). The situation is similar in Canada, where the majority of women walk rather than attending a gym or sports centre (Lachapelle & Lawrence, 2009).

In the case of moderate physical activity, fewer unemployed Polish women (26.3%) undertook exercise of this intensity level 1–2 times per week than their employed counterparts (53.6% (p < 0.001), but they engaged in moderate activities more than 5 times per week more often than the employed women (26.3 vs. 4.3%, respectively). Bruner
and Chad (2013) argue that women tend to engage in lower intensity activities, however, it appears that Polish housewives classify their daily duties as vigorous activities, even though activities of daily living such as floor sweeping, window cleaning, vacuuming, walking or looking after children are typically defined as moderate (>3.0 MET). Because of the above, they prefer to fill their leisure time with less intense activities.

The duration of vigorous and moderate physical activity, and walking did not differ between employed and unemployed Polish women. As many as 73.5% of women declared vigorous exercise lasting less than 75 min per week, 19.1% 75–149 min per week and 7.4% 150–299 min per week. These fractions were 73.8%; 21.5% and 4.7% for the moderate activities, and 69.9%; 24.8% and 4.6% for walking.

The average energy expenditure of the overall physical activity for Polish women was 912.8 ± 1812.1 (Me = 396.0) MET-min/week (vigorous average energy expenditure: 247.3 ± 1312.7 (Me = 0) MET-min/week, moderate average energy expenditure: 166.8 ± 474.1 (Me = 0) MET-min/week, and walking: 498.7 ± 953.8 (Me = 148.0) MET-min/week). This expenditure was much lower than that of Norwegian women (>12 years of education: 1389; <12 years of education: 1024 MET-min/week) (Graff-Iversen, Anderssen, Holme, Jenum, & Raastad, 2007).

The MET-min/week of Polish women was significantly higher for the vigorous physical activity (p < 0.001) among employed (305.2 ± 1506.0; Me = 0) than unemployed women (168.9 ± 991.0; Me = 0). The opposite pattern was observed for walking (employed: 431.4 ± 916.4; Me = 99.0; unemployed: 589.6 ± 997.1; Me = 198.0 MET-min/week).

The potential limitation of the current study is a self-reported PA, which causes substantial overestimations of declared activities (Biernat, Stupnicki, & Gajewski, 2008). This is evident particularly when respondents are declaring activities undertaken in their leisure time.

Conclusion

Polish women nowadays (regardless of whether they are employed or not) still do not engage in a sufficient amount of physical activity in their leisure time to maintain their health, therefore, intervention programmes in both groups are suggested. Programmes promoting physical activity should be developed by taking into account the level of intensity, frequency and duration of exercises. The fact that employed women engaged more often and more enthusiastically in vigorous activities than unemployed women may be an indication of further studies. The duration of the activities, regardless of their type, does not differentiate the investigated groups.

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