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PECULARITIES OF PHYSICAL ACTIVITY IN YOUNG ADULT WOMEN

Резюме. Мета *– верифікувати фактичний рівень фізичної активності жінок молодого віку в умовах, детермінованих сучасними чинниками.*. ***Матеріали і методи****: аналіз та узагальнення даних наукової літератури; соціологічні методи; методи математичної статистики. У дослідженні взяли участь 27 жінок віком 36–40 років.* ***Результати****. Аналіз «робочого» тижня жінок дозволив виявити, що інтенсивна фізична активність є короткочасною та нерівномірно розподіленою серед учасниць. Медіана інтенсивної активності становила лише 3 години на тиждень, при цьому середнє значення (> 6,5 годин) значно відрізнялося, що підтверджується великим стандартним відхиленням та широким міжквартильним розмахом.* ***Висновки****. Встановлений патерн фізичної активності серед жінок, які поєднують роботу/навчання, характеризується домінуванням коротких інтервалів помірної та високої інтенсивності, доповнених регулярною ходьбою. Виявлена тенденція підтверджує переважання седентарного режиму професійної діяльності, наслідком чого може бути погіршення функціональних характеристик постави та потенційне зниження рівня загальної фізичної працездатності.*

Ключові слова*: жінки, молодий вік, фізична активність*

Summary. The ***aim*** *of the study was to verify the actual level of physical activity (PA) among women in the late thirties-mid forties (36–45 years) in the context determined by contemporary factors.* ***Materials and methods****: The research methodology encompassed the analysis and synthesis of scientific literature data, sociological methods, and methods of mathematical statistics. The study involved 27 women belonging to the young adult age.* ***Results****. The late thirties-mid forties age represents a critical stage in a woman's life cycle, where her level of physical activity in Ukraine is determined by a range of complex socio-economic, physiological, and security-related barriers. Our findings corroborate global scientific data regarding the general decline in physical activity during this age. The tendency towards hypokinesia observed in our study aligns with research indicating an increase in sedentary behavior among office workers. Our observation regarding the priority of passive rest over physical activity under conditions of chronic stress supplements conclusions on the psycho-emotional consequences of war that directly impact motor behavior. The data obtained significantly complements existing literature by providing an analysis of the impact of security and social-role barriers on women's physical activity within the context of the Eastern European armed conflict.* ***Conclusions****. It has been established that the physical activity pattern among women engaged in professional or educational activities is characterized by the predominance of short, high-intensity and moderate episodes combined with regular walking. This phenomenon indirectly indicates the dominance of a sedentary type of professional employment, which potentially correlates with dysfunctional features of posture and the level of general physical work capacity.*

Key words*: women, young adult age, physical activity*

Problem statement and analysis of recent research results. The late thirties-mid forties age is a critical stage in a woman's life cycle, where the level of her physical activity in the current conditions of the country (Ukraine) is determined by a number of complex socio-economic, physiological and security barriers [1,2].

Socio-economic and household barriers. This type is characterized by a conflict of roles, namely a combination of professional employment with an expanded family responsibilities range (including caring for children and older relatives), which leads to a chronic lack of time for structured physical activity [3]. An additional limiting factor is the family budget restriction, exacerbated by war conditions, which reduces the availability of commercial health services (fitness center membership) [4].

Physiological and psychological factors. A complex of physiological changes is observed, including a decrease in metabolism, the menopause upcoming , and hormonal changes that can contribute to body weight increase and the motivational component decrease [5,6]. This is accompanied by an exacerbation of orthopedic problems (joints, posture) [7,8,9]. At the psychological level, a high level of stress and emotional burnout is actualized (especially in state of war conditions), which transforms the need for health-improving physical activity into the need for passive rest [10].

Barriers caused by state of war. Security restrictions (air raids, the threat of shelling) limit the possibilities for outdoor health-improving physical activity (running, walking) and

cause interruption of the indoor training process [11,12]. Women with internally displaced status additionally face fragmentation of social support, lack of access to fitness infrastructure, and financial instability, which collectively reduce their physical activity [13,14].

The aim of the study was to verify the actual level of physical activity of women aged 36–45 in the conditions determined by modern factors.

Research Methods and Organization Studies. *Research Methods*. Physical activity was assessed using the full form of the International Physical Activity Questionnaire (IPAQ) [15] with the "last 7 days" reference period. The questionnaire recorded the number of days per week and the typical duration per day for different intensity activities in four areas (domains) used for analytics such as job-related physical activity, transportation, housework, house maintenance, and caring for family and leisure-time physical activity. Sedentary time on weekdays and weekends was taken into account separately [16]. Primary responses in the categories were converted into numerical indicators according to unified rules, where for "days/week" values were recorded in the range of 0–7. Records of "no activity or no walks" were coded as 0. For "duration per day", all intervals were replaced by the average of intervals. For example, if the interval was 31–60 min, the record was converted to 45 min, if 61–90 min -– to 75 min .... 181 and more – to 195 min. On this basis, for each combination of "domain - intensity" weekly minutes were calculated as the product of days per week and average duration in min/day [17,18]. After that, conversion to energy expenditure in MET×min/week was performed using fixed IPAQ coefficients (vigorous activity = 8.0×MET; moderate = 4.0×MET; walking = 3.3×MET). MET (Metabolic Equivalent of Task) was used as a standard measure of energy expenditure, where 1 MET corresponded to resting oxygen consumption of approximately 3.5 milliliters of oxygen per kilogram of body weight per minute, or equivalent to one kilocalorie expended per kilogram of body weight per hour [19].

The MET value for a specific activity reflected how many times its intensity exceeded the resting level. The MET indicator in the domain (life activity area) was defined as the sum of the products of the weekly minutes of appropriate components and its coefficients, and the total weekly energy expenditure was calculated as the sum of METs per week (MET(job/study) + MET(life and movement) + MET(leisure)) [20]. For interpretation, the overall level of physical activity was classified (only by the total indicator ΣMET-min/week, which combines all domains of physical activity such as work/study, movement, life, leisure) according to the following thresholds: low – less than 600 MET×min/week, medium – 600–2999 MET×min/week, high – 3000 MET×·min/week and more. Data quality was ensured through logical range checks (0–7 days; no negative minutes), textual records were normalized, and duration truncation of more than 180 min/day for each activity type was applied according to IPAQ recommendations to reduce the impact of possible self-report errors.

As a result, a set of derived variables was formed for each participant in the form of physical activity in each domain (min/week), MET domains, Σ MET per week, IPAQ category, and sedentary time on weekdays and weekends. These indicators were used in subsequent intergroup comparisons by posture types.

Statistical processing of the obtained data was carried out using the software "SPSS Statistics 17.0".

Participants. 27 women of young age (36–45 years old) were involved in the study, who subsequently underwent instrumental measurements, testing and participated in the experimental program. The distribution by type of posture was as follows: normal – 8 women (29.6%), round back – 7 women (25.9%), scoliotic posture – 12 women (44.5%). Each participant was assigned an individual research code for further comparison with tests and the experiment results. The personal data of the participants were not published or disclosed. Anonymized codes were used in the reporting materials, and access to identifying information was limited to members of the research group within the protocol. The ethical component of

the study was ensured in accordance with the regulatory framework, which includes the main provisions World Medical Association Declaration of Helsinki (regarding the ethical principles of scientific and medical research), the Universal Declaration on Bioethics and Human Rights, and the Council of Europe Convention on Human Rights and Biomedicine [21].

Research results and discussion. The first part of the questionnaire referred to the physical activity of women in the context of professional or educational activities. It found out how systematically and what intensity the participants were involved in physical activity during the work or educational process, as well as what proportion of their weekly workload was intensive, moderate types of activity and walking (Fig. 1).

P1. Job/Study out of home
- No → 29.6% (Skip to P2: TRANSPORTATION)
- Yes → 70.4%
  - P2. Vigorous physical activities (days per week)
    - 0 days → 14.8% (sedentary)
    - 2-3 days → 29.6% (episodic)
    - 4-7 days → 25.9% (regular)
    - missed → 29.6% (logical, no job)
  - P3. Duration of vigorous physical activities (minutes per day)
    - < 30 → 7.4%
    - 31-60 → 25.9%
    - 61-120 → 14.8%
    - >180 → 7.4%
  - P4. Moderate physical activities (days per week)
    - 0 days → 14.8%
    - 1-3 days → 18.5%
    - 4-7 days → 37.0%
    - missed → 29.6%
  - P5. Duration of moderate physical activities (minutes per day)
    - < 30 → 7.4%
    - 31-60 → 22.2%
    - 61-120 → 18.5%
    - >180 → 7.4%
  - P6. Walking (days per week)
    - 0-2 days → 22.2%
    - 3-4 days → 29.6%
    - 6-7 days → 18.5%
    - missed → 29.6%
  - P7. Duration of walking (minutes per day)
    - < 30 → 14.8%
    - 31-60 → 29.6%
    - 61-120 → 14.8%
    - >180 → 3.7%

Fig. 1. Distribution of respondents' responses (in %) to the IPAQ survey item on Job/Study physical activity (n=27)

The first question concerned whether the participants had paid, unpaid work or education outside the home. A positive answer ("yes") was given by more than two thirds of the respondents (19 women or 70.4% of them). The rest (8 women or 29.6%) indicated that at the time of the survey they were not involved in formal work or education, so they immediately went to the next block "Transportation" according to the instructions. This explains the absence of some answers in the tables of this domain: the logic of the survey provided for skipping questions 2–7 in case of "no" answer.

When analyzing the second question, which concerned the number of days in the last week when participants performed physically hard tasks (lifting weights, working while standing, actively climbing stairs, etc.) lasting at least 10 minutes, it was found that intensive activity was observed only in some of the respondents.

Among the 27 respondents, 4 women (14.8%) reported a complete lack of such activity, 5 women (18.5%) performed it two days, three people (11.1%) – three days, one (3.7%) – four days, two women (7.4%) – five days, one (3.7%) – six days, and only three women (11.1%) – seven days a week. In addition, eight women (29.6%) did not answer this question due to the absence of work or study outside the home (logical skips, according to the first question). The median among those who had at least one day of intensive activity was 2 days a week. Thus, intensive loads in a professional or educational environment were episodic (mainly 2–3 days a week), and in 14.8% they were not observed at all, that fits the predominantly sedentary nature of the activities of the majority of respondents.

The third question corresponds to the typical duration of one episode of intense activity within work or study (only for those who had such days according to question 2). The following answers were recorded in the sample: less than 30 min – in 2 women (7.4%); 31–60 min – in 7 women (25.9%), 61–90 min – in 1 (3.7%), 91–120 min – in 2 (7.4%), 121–150 min – in 1 (3.7%), 181 and more min – in 2 (7.4%). This question was not applied to the remaining 12 participants (44.4%), since 8 women (29.6%) had logical skips due to absence of work and study outside the home, and 4 (14.8%) reported no days with intense activity. The median duration among those who had at least one intense day (n = 15) was about 45 min/day. Thus, even when intense episodes occurred, they were mostly less than an hour long, and very long periods (>180 min) were rare.

Regarding the fourth question, it was to establish the number of days of moderate activity within work or study (moving, carrying lightweight objects, etc.; walking was not included). According to the distribution, 4 women (14.8%) did not do this any day. The answer 1 day was given by 1 woman (3.7%), 2 days – 3 women (11.1%), 3 days – 1 woman (3.7%), 4 days – 2 women (7.4%), 5 days – 4 women (14.8%), 6 days – 1 of them (3.7%), 7 days – 3 people (11.1%). Another 8 participants (29.6%) were logical skips. The median among those who had 1 day or more of moderate activity was 2 days per week. Thus, most respondents experienced moderate activity episodically (mostly 1–3 days a week), while 14.8% did not experience it at all, that indicates on generally limited physical involvement in professional and educational activities.

The fifth question focused on the typical duration of one episode of moderate activity within work or study (only those who had at least 1 day of such activity were assessed according to the previous question). Among them (n = 15), a typical episode (median) lasted about 45 minutes. Most often, women named half an hour to an hour: the interval 31–60 min was chosen by 6 out of 27 (22.2%; i.e. 40% among the 15 people involved). Another 2 participants (7.4%; 13.3%) indicated less than 30 min, 61–90 min, 91–120 min and more than 151 min. A single participant (3.7%; 6.7%) indicated a period of 121–150 min. In other words, long sessions of moderate activity were rather the exception, and short activity sessions up to an hour dominated.

The next question asked how many days in the last week the participants walked for at least 10 minutes within the work or study. The most common answer in the survey (5 women (18.5%)) was "5 days a week". Daily walking (7 days) was indicated by 4 women (14.8%),

and episodic walking (3 days) by 3 women (11.1%). For 1 and 2 days, walking was indicated by 2 women for each category (7.4% each). Only one woman (3.7%) walked 6 days a week. The complete absence of such walking within the work was indicated by 2 women (7.4%). For 8 participants (29.6%) the question was not applied due to logical skips in question 1. Among those who had at least one day of such activity, the median was 5 days a week, i.e. walking within work or study was regular and for a significant part almost daily. At the same time, the presence of answers "0–2 days" in some participants emphasizes the mobility variability in the workplace and the jobs with a predominantly sedentary regime.

The last question specified how long a typical day of walking within work or study lasts. Only those who had at least one day of walking according to question 6 (n=17) were analyzed. The most frequently mentioned duration was 31–60 min per day by 8 women (29.6% of the entire sample or 47.1% among n=17); less than 30 min was indicated by 4 women (14.8%; 23.5%). Longer intervals were less common: 61–90 min in 2 women (7.4%; 11.8%), 91–120 min in 2 women (7.4%; 11.8%), more than 151 min in one woman (3.7%; 5.9%). The median among those who walked was about 45 minutes per day, meaning that most participants walked for half an hour to an hour daily at work. Single values of over 150 minutes indicate individual work conditions with high mobility, while short intervals (less than 30 minutes) indicate a predominantly sedentary lifestyle for some participants.

These data allowed us to calculate further energy expenditure indicators in the part "Work/Study" (Table 1), where we analyzed the responses of only those participants who were formally employed or studied outside the home (answered "yes" to question 1). Respondents who did not work or study outside the home, according to the IPAQ instructions, skipped questions 2–7, and their records were considered logically invalid. Therefore, the indicators value in the summary tables was less than 27 people (n=15 for intensive and moderate activity, n=17 for walking).

Table 1

Descriptive statistics and quartiles of the distribution of energy expenditure indicators (MET) of women aged 36–45 by the kinds of physical **activity "Job/Study"**

Indicators	N	M	SD	Min	Max	Quartile		
						Q1	Me	Q3
Vigorous (min/week)	15	402	460.63	30	1365	90	180	735
Moderate (min/week)	15	383	357.26	30	1155	90	300	675
Walking (min/week)	17	277.06	286.24	15	1155	60	225	315
Vigorous (MET)	15	3216	3685.05	240	10920	720	1440	5880
Moderate (MET)	15	1532	1429.04	120	4620	360	1200	2700
Walking (MET)	17	914.29	944.58	49.5	3811.5	198	742.5	1039.5
ΣMET	17	5103.7	5719.9	49.5	19351.5	1435.5	2871	8550

Note: M is the mean; SD is the standard deviation; Min is the minimum, Max is the maximum; Me is the median; Q1 and Q3 are distribution quartiles

The table shows what a typical "working" week looks like for these women. First of all, intense episodes took place, but they were relatively short and varied in different participants. The median was only 3 hours per week, while the mean was more than 6.5 hours of activity with a very large spread (SD=460.6 min/week; 25th (Q1) and 75th (Q3) percentiles were 90 and 735 min/week, accordingly). That is, for most women, intense activities were short, but there are a few high values (Max=1365 min/week) that raise the average score. Moderate activity had similar but less expressed characteristics, indicating a predominance of short moderate loads several times a week. The most stable values were shown by walking within the work or study, which women did about 4 hours a week. At the same time, in reality the range was also wide, some women walked 15 min/week, and others 1155 min/week. In other words, for some women walking was expressed in several short movements daily, while

for others it was a significant part of work activity, which can partially compensate for a sedentary lifestyle.

The conversion into metabolic equivalents clearly outlines the energy weight of each component. According to the medians, we have 1440 MET×min/week for vigorous activity, 1200 MET×min/week for moderate and 742.5 MET×min/week for walking. In total, this is about 3382.5 MET×min/week, where the main contribution is made by vigorous and moderate episodes (approximately 43% and 35%, accordingly), and walking adds another 22%. If we look at the total indicator by domain, the median was 2871 MET×min/week with an interquartile range of 1435.5–8550 MET×min/week. That is, the work activity of different women was very different, from almost sedentary days to noticeably active work.

Our results are confirmed by the data of the world scientific community on the general decrease in physical activity in the second mature period [22,23].

The tendency towards hypokinesia that we have identified is consistent with studies [24] indicating an increase in sedentary style among office workers.

Our observation of the priority of passive rest over physical activity in conditions of chronic stress complements the conclusions [25] on the psycho-emotional effects of war, which directly affect motor behavior.

The data we obtained significantly complement the existing literature by analyzing the impact of security and socio-role barriers on the physical activity of women in conditions of the Eastern European military conflict.

Conclusions. It was found that the pattern of physical activity among women engaged in professional or educational activities is characterized by the predominance of short, high-intensity and moderate episodes in combination with regular walking. This phenomenon indirectly indicates the dominance of a sedentary type of professional employment, which potentially correlates with dysfunctional posture features and general physical performance level.

Prospects for further research include the detailed analysis of physical activity indicators among the female population by comparing them with the morphobiomechanical type of posture, verified by the IPAQ questionnaire methodology.

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