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Pregnant and active – suitability of the Pregnancy Physical Activity Questionnaire for measuring the physical activity of pregnant women in Poland

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary **Background.** The issue of physical activity of pregnant women, including determining proper recommendations, has been a broadly discussed topic in international circles.
Objectives. The aim of this paper is to present the suitability of the Pregnancy Physical Activity Questionnaire (PPAQ) for measuring the physical activity of pregnant women in Poland.
Material and methods. The study included 162 questionnaires, which were filled in correctly by pregnant women (third trimester) who took part in childbirth classes organized by a childbirth school. As a research method, the PPAQ was chosen. The PPAQ allows pregnant women to self-assess their physical activity in the current trimester. The questions investigated time devoted to various types of activity related to household/caregiving, transportation, sports/exercise in their free time, occupational activity and inactivity. Based on the average weekly energy expenditure, each of these activities is classified by intensity: sedentary activity, light-intensity activity, moderate-intensity activity, vigorous-intensity activity.
Results. While using the PPAQ in Poland, it is recommended to reduce the number of questions from 36 to 35, by removing question 18 (time of mowing lawn while on a riding mower). It is also advisable to convert American units of measurement into metric units, which are used in Poland.
Conclusions. The Pregnancy Physical Activity Questionnaire in Poland may fill the gap in studies devoted to the physical activity of pregnant Polish women. With this questionnaire, it is possible to determine energy expenditure in terms of intensity and type of physical activity. It also serves as a reliable tool that can be used for international comparisons.
Key words: pregnancy, physical activity, health promotion, questionnaire, woman, PPAQ.

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Background

Nowadays, preventive healthcare is one of the most widely discussed issues related to the health of pregnant women [1]. The holistic approach to human health and disease prevention has become an interdisciplinary issue faced by specialists from numerous fields of science. The health of pregnant women and their babies is currently a goal which needs to be attained not only during pregnancy, but even at the stage of planning one's pregnancy.

To ensure the health of pregnant women, a combination of the following factors needs to be observed: folic acid supplementation [2], omega-3 fatty acid supplementation [3], healthy nutrition [4], dental health [5], depression prevention [6], alcohol consumption prevention [7], smoking prevention [8], as well as taking up physical activity [9]. The issue of physical activity of pregnant women, including determining proper recommendations, has been a broadly discussed topic in international circles [10]. Nowadays, medical advances and broader knowledge based on extensive research have resulted in general acceptance and appreciation for physical activity during pregnancy [11]. Currently, doctors around the world present guidelines on the intensity and duration of physical activity, provided there are no medical contraindications and the woman consults the issue with her doctor [10, 12]. One of benefits of physical activity during pregnancy is a reduced risk of gestational diabetes [13]; nevertheless, the level of knowledge in Polish women about gestational diabetes is still insufficient [14]. Physical activity helps control body mass and prevents obesity [15], which increases perinatal mortality [16]. Additionally, physically active women tend to experience fewer side effects of pregnancy, such as insomnia, anxiety and somatic symptoms (e.g. fatigue, heartburn, nausea, leg cramps and edema) [17]. It has also been noted that properly selected and safe physical exercises do not increase the risk of premature birth [18]. Nevertheless, literature points to many obstacles, fears and barriers that discourage women from physical activity during pregnancy [19, 20].

It is especially important to investigate the current level of physical activity of pregnant women in order to popularize promotional activities and organize social campaigns aimed at creating proper prevention programs, changing awareness and encouraging women to be active while pregnant.

Conducting population-based research in terms of the physical activity of pregnant women in Poland is currently a challenging task, because there is no single, commonly used tool targeted solely at pregnant women. Therefore, this paper aims at presenting the Pregnancy Physical Activity Questionnaire as a tool to measure the physical activity of pregnant women in Poland, as well as determining whether it can be used in Poland.

Material and methods

Participants

The study included 162 questionnaires filled in correctly by pregnant women (third trimester) who took part in childbirth classes organized by a childbirth school in Szczecin, Poland. The questionnaire was completed only by pregnant women who voluntarily agreed to participate in this research. 200 questionnaires were distributed to women, only 162 of which were fully and properly completed. 12 questionnaires were incompletely or incorrectly filled in, and 26 questionnaires were not returned. Respondents were 29.3 ± 3.5 years old. 88% of them completed college, 11% high school and 1% elementary school. The vast majority (91%) were from Szczecin, while 9% lived in the surrounding area. 83% of the subjects were married, 15% were single, while 2% were divorced. 90% were childless, and 10% had 1 child. The permission of the Bioethics Committee to conduct the research was obtained.

Research method

As a research method, the Pregnancy Physical Activity Questionnaire (PPAQ) was selected, which was designed by Chasan-Taber et al. [21]. This allows pregnant women to self-assess their physical activity in the current trimester. All subjects completed the questionnaire independently. Originally, the questionnaire contained 36 questions.

The first 3 questions related to personal data, and the remaining 33 questions investigated time devoted to various types of activity related to:

1) household/caregiving – 13 questions,
2) transportation – 3 questions,
3) sports/exercise in their free time – 9 questions,
4) occupational activity – 5 questions,
5) inactivity – 3 questions.

Additionally, at the end of the sports/exercise section of the PPAQ, two open-ended questions allowed the respondent to add any activities not previously listed.

Respondents needed to choose one of the suggested time ranges per day:

- none, less than 1/2 hour per day, 1/2 to almost 1 hour per day, 1 to almost 2 hours per day, 2 to almost 3 hours per day, 3 or more hours per day (questions: 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 19, 20, 21);
- none, less than 1/2 hours per day, 1/2 to almost 2 hours per day, 2 to almost 4 hours per day, 4 to almost 6 hours per day, 6 or more hours per day (questions: 12, 13, 31, 32, 33, 34, 35);

as well as choose one of the suggested categories for activities carried out every week:

- none, less than 1/2 hour per week, 1/2 to almost 1 hour per week, 1 to almost 2 hours per week, 2 to almost 3 hours per week, 3 or more hours per week (questions: 17, 18, 22, 23, 24, 25, 26, 27, 28, 29, 30).

Based on the average weekly energy expenditure, each of these activities was additionally classified by intensity:

a) sedentary activity,
b) light-intensity activity,
c) moderate-intensity activity,
d) vigorous-intensity activity.

The questionnaire helped measure average weekly energy expenditure related to total activity in MET units (MET-h/week). To calculate the energy expenditure for a given activity, the time devoted to the activity is multiplied by the intensity level assigned to it. Calculations were conducted according to the instructions provided by the authors of the questionnaire [22], which included MET values for all activities.

Having obtained the permission of the PPAQ's author [21], the first stage of adapting the questionnaire to Polish realities was to translate it into Polish (forward translation) by two independent native Polish translators proficient in English. Next, one reconciled Polish version of the questionnaire was approved. The next stage was back-translation, which was meticulously provided by two independent native-English translators. The back-translated versions were deemed consistent with the original version. Finally, the most linguistically correct Polish version of the questionnaire was approved.

Results

Table 1 presents the original questions in the PPAQ. Each activity was classified by type and intensity.

There were 13 questions related to household/caregiving activity – 6 of them were considered light-intensity activities and 7 moderate-intensity activities. Having analyzed all questions and responses given by the subjects in this section of the questionnaire, it was decided that in Poland, question 18 should be omitted (*time of mowing lawn while on a riding mower*).

There were 3 questions related to transportation activity, two of which were light-intensity activities, and one was moderate-intensity activity. Having analyzed all questions and responses given by the subjects in this section of the questionnaire, it is proposed that no question should be omitted.

There were 9 questions related to sports/exercise activity, five of which were moderate-intensity activities, and two were vigorous-intensity activities. Additionally, there were two open-ended questions (*), which allowed the respondent to add any activities not previously listed. Their intensity should be verified and calculated according to the guidelines in the Compendium of Physical Activities [22]. Having analyzed all questions and responses given by the subjects in this section of the questionnaire, it is proposed that no question should be omitted in Poland.

Occupational activity section was completed only by respondents in paid employment, those who worked as volunteers or those who studied. If the respondent was a housewife, unemployed or unable to work, she did not fill in that section of the questionnaire. This section included 5 questions, 3 of which were light-intensity activities, and two were moderate-intensity activities. To adjust the questionnaire to Polish realities, in questions 33 and 35, it is recommended to convert American measurement units into metric units, which are used in Poland, and '1 gallon' should be replaced with '4 liters'. Having analyzed all questions and responses given by the subjects in this section of the questionnaire, it is proposed that no question should be omitted in Poland.

Additionally, there were 3 questions in the questionnaire related to inactivity. One of these related to light-intensity activity, and the remaining two to sedentary activities. It is proposed to keep all these questions in the Polish version of the questionnaire as well.

Table 2 presents particular results based on the Pregnancy Physical Activity Questionnaires (PPAQs) by activity intensity and type among 162 pregnant women.

As results from the presented values, the median for total activity of surveyed women was 246.41 MET-h/week. Taking into account the activity as far as the level of intensity is concerned, women obtained the highest median (153.91 MET-h/week) for moderate activity. In turn, taking into consideration the type of activity, the highest energy expenditure was obtained by the surveyed women within the activity of household/caregiving (Mdn = 69.04 MET-h/week).

Table 1. Questions from the original questionnaire with indication whether it was modified and whether it was kept in the Polish version

Activity	Question no.	Intensity	Questionnaire question content	Question modified/ kept in Polish version
Household/care giving activity	4	L	Preparing meals (cook, set table, wash dishes)	no/yes
	5	L	Dressing, bathing, feeding children while you are sitting	no/yes
	7	L	Playing with children while you are sitting or standing	no/yes
	15	L	Light cleaning (make beds, laundry, iron, put things away)	no/yes
	16	L	Shopping (for food, clothes, or other items)	no/yes
	17	L	Heavier cleaning (vacuum, mop, sweep, wash windows)	no/yes
	18	L	Mowing lawn while on a riding mower	-/no
	6	M	Dressing, bathing, feeding children while you are standing	no/yes
	8	M	Playing with children while you are walking or running	no/yes
	9	M	Carrying children	no/yes
	10	M	Taking care of an older adult	no/yes
	14	M	Playing with pets	no/yes
	19	M	Mowing lawn using a walking mower, raking, gardening	no/yes
Inactivity	11	L	Sitting and using a computer or writing, while not at work	no/yes
	12	S	Watching TV or a video	no/yes
	13	S	Sitting and reading, talking, or on the phone, while not at work	no/yes
Transportation activity	20	L	Walking slowly to go places (such as to the bus, work, visiting). Not for fun or exercise	no/yes
	22	L	Driving or riding in a car or bus	no/yes
	21	M	Walking quickly to go places (such as to the bus, work, or school). Not for fun or exercise	no/yes
Sports/exercise activity	23	M	Walking slowly for fun or exercise	no/yes
	24	M	Walking more quickly for fun or exercise	no/yes
	27	M	Prenatal exercise class	no/yes
	28	M	Swimming	no/yes
	29	M	Dancing	no/yes
	25	V	Walking quickly up hills for fun or exercise	no/yes
	26	V	Jogging	no/yes
	30	*	Doing other things for fun or exercise? Please tell us what they are	no/yes
	31	*	Doing other things for fun or exercise? Please tell us what they are	no/yes
Occupational activity	32	L	Sitting at work or in a class	no/yes
	34	L	Standing or slowly walking at work not carrying anything	no/yes
	33	M	Standing or slowly walking at work while carrying things (heavier than a 1 gallon milk jug)	yes/yes
	35	M	Walking quickly at work while carrying things (heavier than a 1 gallon milk jug)	yes/yes
	36	M	Walking quickly at work not carrying anything	no/yes

L – Light-intensity activity, M – moderate-intensity activity, V – vigorous-intensity activity, S – sedentary activity; * – intensity according to the Compendium of Physical Activities [22].

Table 2. Median, 25th and 75th percentile values (MET-h/week) for total activity and subscales of activity for the Pregnancy Physical Activity Questionnaire

PPAQ Measures	PPAQ 1st (MET-h/week)		
	25th	Median	75th
Summary activity stores:			
Total activity	204.48	246.41	318.25
Total activity of light intensity and above	152.35	198.26	259.79
By intensity:			
Sedentary (< 1.5 METs)	30.63	44.63	65.10
Light (1.5 – < 3.0 METs)	122.50	153.91	191.63
Moderate (3.0–6.0 METs)	22.66	44.39	81.48
Vigorous (> 6.0 METs)	0.00	0.00	1.63

Table 2. Median, 25th and 75th percentile values (MET-h/week) for total activity and subscales of activity for the Pregnancy Physical Activity Questionnaire

PPAQ Measures	PPAQ 1st (MET-h/week)		
	25th	Median	75th
By type:			
Household/caregiving	54.60	69.04	98.67
Occupational activity	0.00	0.00	71.05
Sports/exercise	7.20	13.78	25.01
Transportation	28.22	51.63	91.00
Inactivity	42.18	64.31	83.48

Discussion

The aim of this study was to present the suitability of the Pregnancy Physical Activity Questionnaire for measuring the physical activity of pregnant women in Poland. Measuring physical activity is a complex issue; therefore, using a questionnaire as a research tool (despite its limitation) remains the most common method employed in population-based studies.

International authors tend to use various questionnaires to assess pregnant women's physical activity [21, 23–26]. Some of them are targeted solely at pregnant women, e.g. the Pregnancy Physical Activity Questionnaire (PPAQ) [21] or the Third Pregnancy Infection and Nutrition Study (PIN3) Physical Activity Questionnaire [23]. The PPAQ provides data on physical activity and actions taken during the current trimester, while the PIN3 measures the physical activity of pregnant women during the week before the research. Some researchers utilized popular physical activity questionnaires used for measuring activity in the last 7 days before the study amongst the general population, i.e. International Physical Activity Questionnaire (IPAQ) [24, 25], while others modified it [26] to include only questions related to forms of leisure and household chores within the past two weeks. Furthermore, there are publications which analyze the suitability of general questionnaires for assessment of physical activity, e.g. Kaiser Physical Activity Survey [27], among pregnant women. Undoubtedly, the variety of questions and scales of measurement make it harder to interpret and compare the results of different questionnaires.

In recent years, the most commonly used tool has been the Pregnancy Physical Activity Questionnaire (PPAQ), which was adapted and assessed in terms of reliability by researchers who worked on Vietnamese, Japanese and French versions [28–33]. Due to cultural differences in all these countries, minor changes were implemented in the final versions of the questionnaires [28–33]. Similarly to the Polish version, in both the Vietnamese and French versions, question about mowing lawn while on a riding mower was additionally omitted, and measurement units were converted to facilitate the comprehension of questions. In Poland, gallons of milk could be replaced by liters of milk, while in the Japanese version, '3kg of rice' was proposed as a replacement.

Conclusions

Taking into account the need to increase the consciousness and promotion of health-related behaviors of pregnant women in Poland, the present suggestion to use the PPAQ with a slight modification seems to be relevant in this issue. This is indicated that in the assumptions of the modern health care there are important health promotion and disease prevention programs which include a measurement of health-related behaviors and inhibit the progression of chronic disease and the incidence of complications [34].

It is worth noting that in Poland, the International Physical Activity Questionnaire is generally accepted and widely used in the assessment of physical activity [35]. Nevertheless, it should be noted that due to increasing international popularity of the Pregnancy Physical Activity Questionnaire and lack of prevalent tool in Poland to measure the physical activity of pregnant women, the authors feel that the PPAQ may help fill the gap in Polish research on the physical activity of pregnant women. In the Polish version of the questionnaire, it is recommended to reduce the number of questions from 36 to 35 (by omitting question 18) and convert American measurements into the metric system, which is used in Poland. One of the advantages of the PPAQ is its meticulous and conscientious preparation in terms of guidelines for analyzing results, as well as its attractive visual form, which facilitates the task for respondents. Using the questionnaire in Poland may help assess the energy expenditure of pregnant women, based on intensity or type of activity, as well as enable international comparisons.

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