

קביעת נורמות לפעילות גופנית באמצעות השאלון Beacke Physical Activity Questionnaire

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תוצאות - הנורמות לפ"ג שנמצאו במחקר זה הבחינו בין אנשים מקבוצות גיל שונות, בין מגדרים ובין אנשים עם ובלי כאבי גב תחתון. הבדלים אלה הומחשו בכל אחד מהאינדקסים של BPAQ בנפרד אך לא בהתייחס לציון הכולל שלו.

מסקנות - קביעת נורמות של BPAQ יכולה להתאים לשימוש בקרב אוכלוסייה רחבה עם מאפיינים דומים לאלה של האוכלוסייה עליה נמדדו הנורמות. קלינאים וחוקרים יכולים להשתמש בנורמות הללו לצורך השוואה של רמת פ"ג של פרטים ושל קבוצות תוך התייחסות לכל אינדקס של המדד בנפרד. הנחיות לביצוע פ"ג של הפרט צריכות להתבסס לא רק על המלצות ארגון הבריאות העולמי, אלא גם על השוואה בין רמת הפעילות של אותו אדם בחיי היום יום לבין נורמות לפ"ג לפי קבוצת הגיל שלו, מגדר, מצב רפואי ורקע סוציודמוגרפי.

מילות מפתח - גיל, מגדר, כאבי גב תחתון, BPAQ, פעילות גופנית

הקדמה - הערכת רמת הפעילות הגופנית (פ"ג) של הפרט או של קבוצה צריכה להיות מרכיב בלתי נפרד של איסוף נתוני מטופל בפיזיותרפיה לצורך תכנון תוכנית התערבות.

מטרות - 1. לקבוע נורמות לפעילות גופנית לפי Baecke Physical Activity Questionnaire (BPAQ) בקרב מדגם של מבוגרים המתגוררים בקהילה. 2. לזהות נורמות ייחודיות לקבוצות גיל, למגדר ולאנשים עם כאבי גב תחתון.

שיטות - המחקר מבוסס על נתונים מסקר חתכי שנערך במחקר קודם וכלל 3350 תושבי יישוב אחד בישראל בני 22-65. המשתתפים חולקו לחמש קבוצות גיל ($30 \leq 40$; $31-40$; $41-50$; $51-60$; $61 \leq$). ממוצעים, סטיות תקן ו-95% רווח בר סמך של הציון הכולל של הפ"ג ושל שלושת האינדקסים שלו בנפרד (אינדקס פ"ג בעבודה, אינדקס פ"ג ספורט, אינדקס פ"ג בשעות הפנאי) נותחו לפי קבוצות גיל, מגדר וקבוצות כאבי גב תחתון.

Using the Beacke Physical Activity Questionnaire to Establish Physical Activity norms

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Abstract

Introduction: Evaluation of individuals' or groups' physical activity (PA) levels should be an integral component of physical therapy intake for further intervention.

Purpose: 1. To establish norms of PA levels measured using the Baecke Physical Activity Questionnaire (BPAQ) in a community-based sample of adults; 2. to identify norms for age, gender; and low back pain subgroups.

Methods: The study is based on data obtained from a previous cross-sectional survey of all 3350 adult inhabitants (ages 22 and 65) in one town in Israel. Five age groups were examined: ≤ 30 ; 31-40; 41-50; 51-60; ≥ 61 . The BPAQ was used to evaluate PA levels.

Data Analysis: Means, standard deviations and 95% confidence intervals of BPAQ total and per-index scores (Occupation Activity Index - OAI, Sport Activity Index - SAI, and Leisure Activity Index - LAI) were analyzed according to age group, gender, and LBP group.

Results: The PA norms that emerged differed by age group, gender, and by the existence of LBP. These differences were manifested in each of the BPAQ

indices separately, but not for the total BPAQ score.

Conclusions: Pre-established norms of BPAQ may be suitable for use in a large population with similar characteristics. Clinicians, as well as researchers, can use the norms as a point of comparison with individuals' and groups' current PA levels, taking care to evaluate the levels of OAI, SAI and LAI separately. The discussion about a patient's PA potential should be based not only on the WHO's (World Health Organization) recommendations, but also on a comparison between the patient's current habitual activity and the norms of the patient's age group, gender, medical condition, and socioeconomic background.

Key words: age, gender, low back pain, BPAQ

Introduction

Evaluation of individuals' or groups' physical activity (PA) levels should be an integral component of physical therapy intake for further intervention.¹ The use of norms provides a point of comparison between the individual's score(s) and those of a large group of statistically selected individuals. This information may serve as a crucial clinical tool for planning and evaluating treatment programs and for recommending follow-up steps.

Numerous studies have demonstrated the benefits of PA in different populations, as well as the negative effects of sedentary behavior on physical and mental wellbeing.²⁻⁵ The deleterious effects of physical inactivity are associated with many of the most common chronic diseases and conditions, including heart disease, type-2 diabetes mellitus, hypertension, obesity, osteoporosis, depression, and breast and colorectal cancers.^{6,7} In 2010, the World Health Organization (WHO) published the "Global Recommendations on PA for Health," which advocate for a minimum of 150 minutes of moderate PA per week.⁸ However, despite the well-established individual benefit of leading a physically active lifestyle, too many people engaged in PA fail to follow the WHO-recommended level of PA.⁹

Thus, as PA has become an increasingly prominent intervention tool, it is necessary to establish a routine and consistent assessment of PA, both in clinical settings and in research, in order to encourage people to reach more healthful PA levels. Physical therapists who are expected to promote, guide, prescribe, and manage exercise activities and efforts should evaluate individual and group levels of PA prior to devising any intervention.¹⁰

The two types of subjective methods that are widely used to assess PA are self-report questionnaires and

self-report activity diaries/logs.¹¹⁻¹³ Although not new, an additional questionnaire that deserves attention is the Baecke Physical Activity Questionnaire (BPAQ).¹⁴ This questionnaire is especially suitable for use in physical therapy, as it provides a subjective evaluation of habitual PA measured in reference to three indices: Occupation Activity Index (OAI), Sport Activity Index (SAI), and Leisure Activity Index (LAI). A comparison of the BPAQ and Tecumseh questionnaires concluded that the former yielded superior results, probably because it was simpler.¹⁵

The BPAQ's validity and reliability were established both in healthy populations,¹⁶⁻¹⁹ as well as in groups with various medical and musculoskeletal conditions, such as coronary diseases (Intraclass Correlation (ICC) > 0.85) (7), HIV/AIDS,²⁰ low back pain (LBP),^{21,22} and hip Osteoarthritis (ICC values were 0.84, 0.83, 0.78 and 0.87 for OAI, SAI, LAI, and for the total score respectively).²³ The reliability of the Hebrew version of the BPAQ, evaluated among patients with LBP, was very good for OAI (ICC = .90), and moderate for SAI and LAI (ICC = .71 .70 respectively).²¹ Verbunt et al. (2005) evaluated habitual PA among a sample of patients with non-specific LBP.²² They concluded that a proper evaluation of the impact of activity-related changes on disability in LBP should be based on a measured change, rather than on the current PA level.

Evidence of an indirect association between OAI, and education, as well as between LAI and education formed the basis of recommendations to separately analyze data pertaining to each of the three indices.^{24,25} The recommendation was further supported by similar results regarding the association between OAI and SAI and LBP.²⁶ The BPAQ has some limitations as well, mainly that responses are dependent on the participant's ability to recall activities of the previous year, and that it is less robust in terms of measuring PA intensity levels and in distinguishing among various types of PA.

As mentioned earlier, there is a major discrepancy between the WHO-recommended PA levels and the actual levels of PA that people practice, worldwide⁹ and in Israel.²⁷ Despite the abundance of studies that provide information on the use of the BPAQ,¹⁶⁻¹⁹ these studies do not provide clear data regarding the use of PA norms. Establishing such norms could serve to reflect the current level of PA of individuals and groups, by providing a point of comparison. With this knowledge, physical therapists could provide more accurate recommendations and follow-up.

Norms, or standards, are widely used as a reference point for the functional assessment of healthy individuals, as well as in various pathological situations. Normative standards have been defined for various measurement tools. For example, the six minute walk test in healthy adults,²⁸ COPD^{29,30} and Alzheimer's disease patients;³¹ and the Functional Independence Measure (FIM) instrument for various medical conditions (e.g.: spinal cord injury;³² stroke patients;³³ hip or knee arthroplasty³⁴ and community-dwelling elderly people).³⁵ These findings are highly important for assessing the functional ability of individuals or patients and for defining realistic treatment goals. To our knowledge, there are no published, community-based norms for any of the self-report PA questionnaires. Data gathered from our previous community-based study provided an opportunity to address this issue with regard to the BPAQ.³⁶

Taken together, the aims of the current study were: 1) to establish norms for the total BPAQ score and for its three indices, among a community-based sample of adults; 2) to identify norms by age and gender; and 3) to examine whether these norms differ between participants with and without LBP. This study is expected to provide practical clinical information about norm variations and typical rates across age and gender groups in the adult population. The results obtained may prove useful also

for the subsequent evaluation of individual and group performance, as well as for future research.

Methods

Setting and Participants - This study is based on data collected during a cross-sectional survey previously conducted in a single town in Israel.³⁶ The survey included all of the town's adult inhabitants between the ages of 22 and 65 (N=3350). The majority of this population may be characterized as white-collar workers, of middle and high socioeconomic classes. Inclusion criteria were residing in the town at the time of the survey and fluency in Hebrew. Data regarding non-respondents and the list of reasons for exclusion were described in a previous study.³⁶ The Institutional Review Board of the Hadassah Medical Center, Jerusalem approved the study.

The study population consisted of 2012 inhabitants (60% response rate) who completed the questionnaires. Nearly half took part in regular sporting activities, nearly half were men and about one third reported having LBP during the previous month. Age and educational distribution of the population revealed a slightly higher rate of young and educated people than that of the general Jewish population in Israel (Israel Central Bureau of Statistics 1998).

Data collection - The survey encompassed a 12-month period, from April 1999 to March 2000. All inhabitants were randomly assigned to one of twelve clusters by street. Those who met the inclusion criteria received (by messenger delivery) self-administered questionnaires accompanied by a cover letter and an informed consent form. To the best of our knowledge, as there is no evidence indicating any major changes in people's habitual PA levels over the past years, it is assumed that the data collected in 2000 is relevant also today.

Variables - The questionnaire included items regarding demographics (e.g.: age, gender), habitual PA and LBP. Subjects were grouped into five age groups: ≤ 30 ; 31-40; 41-50; 51-60; ≥ 61 . The BPAQ evaluated PA.¹⁴ The OAI is composed of sum scores of eight items regarding frequency of specific activities during work (e.g. walking, sitting, lifting heavy objects). The SAI is composed of the multiplication of three scores: level of intensity (depends on type of sports activity), time (number of activity hours per week), and proportion (number of activity months during the year). The intensity is determined by expected level of energy expenditure during a specific activity. Thus, activities with higher-energy demands (e.g. soccer, bicycle riding, jogging) were assigned a higher score, activities of moderate energy demands (e.g., swimming, walking) were assigned a moderate score, and activities of low energy demands (e.g., calisthenics, yoga) were assigned the lowest intensity score. The LAI is composed of the sum scores of five items regarding frequency of activities during leisure time (e.g., cycling, going shopping on foot).

Low back pain was defined as “a pain between the 12th rib and the lower glutei folds, which lasted at least one day and interfered with regular daily activity”. Inhabitants reporting LBP during the previous month were categorized in the “with LBP” group.

Data analysis - Scores of the total BPAQ and of its indices (OAI, SAI, LAI) were described by means, standard deviations and 95% confidence intervals within the five age groups. Sport Activity Index was calculated for those who participated in at least one sports activity. Analysis of variance (ANOVA) evaluated norm differences between age groups, gender groups, and LBP subgroups. A p-value of ≤ 0.05 was considered statistically significant.

Results

Total population - Mean scores of total BPAQ and of each index within age groups are presented in Table 1. The upper and lower bounds of the 95% confidence intervals of each of the means does not exceed 10%. The distribution of OAI and LAI scores were close to normal (Skewness .33, -.15 respectively), but not that of SAI (Skewness 1.21). The SAI scores correlated significantly ($r = .33$) with the LAI, but not with the OAI scores. Age groups differences were observed for SAI, OAI, and LAI scores, but not for the total BPAQ score.

Gender and age groups - Mean scores of the total BPAQ and of each index within the gender and age subgroups are presented in Table 2. Men scored higher than women did in the OAI and SAI, but not in the total BPAQ or the LAI. Age group differences were observed for the total BPAQ, for the OAI and the SAI. The total BPAQ and SAI were highest among the youngest male subgroup (age ≤ 30). Women’s OAI scores were higher than the men’s OAI scores in most age groups. No difference was found in the LAI scores by either age group or gender.

LBP and age groups - Mean scores of the total BPAQ and of each index within LBP and age groups are presented in Table 3. Mean scores differed significantly between subgroups with and without LBP at all PA indices, but not in the same direction and not for the total BPAQ. The OAI mean scores were higher among those with LBP compared to those without LBP. On the contrary, the SAI and LAI mean scores were lower among those with LBP compared to those without LBP. Mean scores within age groups did not differ significantly at any category.

Table 1. Mean Scores on Beacke Physical Activity Questionnaire (BPAQ) by age groups

Indices		Age groups						*.Sig
		30 ≥	31-40	41-50	51-60	61 ≤	Total	
Total BPAQ (2.04-17.29)	N	220	424	789	360	99	1892	0.09
	Mean	6.15	5.88	6.14	5.93	6.24	6.06	
	SD	2.10	1.73	2.02	1.71	1.90	1.91	
	95% CI	5.94-6.48	5.69-6.09	6.01- 6.31	5.69-6.13	5.77-6.56	5.95-6.18	
Occupation Activity Index (1-5)	N	220	424	789	360	99	1892	.062
	Mean	2.62	2.61	2.57	2.59	2.79	2.60	
	SD	0.75	0.69	0.70	0.76	0.73	0.72	
	95% CI	2.52-2.72	2.55-2.68	2.52-2.62	2.51-2.67	2.65-2.94	2.67-2.63	
Sport Activity Index, Participated in at list one sport activity. (0.04-7.29)	N	97	176	366	164	48	871	.009
	Mean	2.21	1.65	1.96	1.72	1.73	1.87	
	SD	1.53	1.34	1.41	1.36	1.38	1.41	
	95% CI	1.90-2.52	1.46-1.85	1.81-2.10	1.32-2.13	1.77-1.96	2.52-2.72	
Leisure Activity Index (1-5)	N	220	424	789	360	99	1892	.695
	Mean	2.55	2.57	2.61	2.55	2.60	2.58	
	SD	0.71	0.74	0.76	0.70	0.85	0.74	
	95% CI	2.45-2.65	2.50-2.65	2.55-2.66	2.47-2.62	2.43-2.77	2.55-2.61	

*Evaluated by analysis of variance (ANOVA)

Table 2. Mean Scores on Beacke Physical Activity Questionnaire (BPAQ) by gender and age groups

Indices		Age groups						Sig.*
		≤ 30	31-40	41-50	51-60	≥ 61	Total	
Total BPAQ (2.04-17.29) Male	N	100	172	354	186	50	862	.008
	Mean	6.68	5.87	6.09	5.92	6.27	7.16	
	SD	2.36	1.67	2.13	1.84	2.18	2/02	
	95% CI	6.30-7.05	5.58-6.15	5.89-6.28	5.64-6.19	5.74-6.80	6.00-6.32	
Total BPAQ (2.04-17.29) Female	N	120	252	435	174	49	1030	
	Mean	5.72	5.62	6.19	5.95	6.22	6.91	
	SD	1.77	1.80	1.94	1.58	1.59	1.81	
	95% CI	5.37-6.06	5.66-6.13	6.01-6.36	5.67-6.24	5.68-6.75	5.84-6.14	
Occupation Activity Index (1-5) Male	N	100	172	354	186	50	862	.009
	Mean	2.73	2.58	2.51	2.47	2.65	2.58	
	SD	0.79	0.74	0.68	0.77	0.80	0.73	
	95% CI	2.58-2.86	2.47-2.69	2.43-2.58	2.36-2.57	2.45-2.85	2.52-2.64	
Occupation Activity Index (1-5) Female	N	120	252	435	174	49	1030	
	Mean	2.54	2.64	2.62	2.74	2.95	2.69	
	SD	0.72	0.65	0.72	0.74	0.63	0.70	
	95% CI	2.40-2.66	2.55-2.73	2.55-2.69	2.63-2.84	2.74-3.14	2.64-2.75	
Sport Activity Index** (0.04-7.29) Male	N	57	71	158	83	21	390	.000
	Mean	2.36	1.73	2.19	1.92	2.23	2.03	
	SD	1.67	1.37	1.55	1.58	1.78	1.54	
	95% CI	2/00-2.72	1.40-2.05	1.96-2.40	1.61-2.21	1.63-2.83	1.91-2.25	
Sport Activity Index*** (0.04-7.29) Female	N	40	105	228	81	27	481	
	Mean	2.01	1.61	1.81	1.53	1.34	1.69	
	SD	1.33	1.33	1.30	1.09	0.82	1.25	
	95% CI	1.57-2.44	1.34-1.87	1.02-1.98	1.23-1.83	0.81-1.86	1.49-1.82	
Leisure Activity Index (1-5) Male	N	100	172	354	186	50	862	.784
	Mean	2.61	2.57	2.60	2.60	2.68	2.61	
	SD	0.75	0.67	0.78	0.68	0.87	0.73	
	95% CI	2.45-2.75	2.46-2.68	2.52-2.68	2.48-2.70	2.47-2.88	2.55-2.67	
Leisure Activity Index (1-5) Female	N	120	252	435	174	49	1030	
	Mean	2.51	2.58	2.62	2.50	2.58	2.55	
	SD	0.69	0.80	0.75	0.73	0.85	0.75	
	95% CI	2.37-2.64	2.49-2.67	2.58-2.68	2.39-2.61	2.32-2.74	2.49-2.61	

*Evaluated by analysis of variance (ANOVA);

** Evaluated for those participated in at list one sport activity.

Table 3. Mean Scores on Beacke Physical Activity Questionnaire (BPAQ) in low back pain (LBP) and age groups

Indices		Age groups						Sig. *
		≤ 30	31-40	41-50	51-60	≥ 61	Total	
Total BPAQ (2.04-17.29) without LBP	N	152	297	566	255	64	1334	.243
	Mean	6.06	5.88	6.12	5.96	6.43	6.04	
	SD	2.07	1.73	2.08	1.70	2.06	1.94	
	95% CI	5.75-6.34	5.66-6.10	5.96-6.27	5.73-6.20	5.96-6.90	5.96-6.22	
Total BPAQ (2.04-17.29) with LBP	N	68	127	223	105	35	558	
	Mean	6.36	5.89	6.20	5.85	5.90	6.07	
	SD	2.17	1.74	1.88	1.75	1.52	1.85	
	95% CI	5.91-6.82	5.56-6.23	5.95-6.45	5.49-6.22	5.26-6.53	5.85-6.23	
Occupation Activity Index (1-5) without LBP	N	152	297	566	266	64	1334	.001
	Mean	2.52	2.53	2.50	2.50	2.75	2.62	
	SD	0.71	0.68	0.68	0.74	0.71	0.70	
	95% CI	2.41-2.63	2.45-2.61	2.45-2.56	2.41-2.59	2.58-2.92	2.51-2.61	
Occupation Activity Index (1-5) with LBP	N	66	127	223	106	99	568	
	Mean	2.84	2.82	2.73	2.82	2.79	2.79	
	SD	0.80	0.66	0.73	0.77	0.78	0.73	
	95% CI	2.67-3.01	2.69-2.94	2.64-2.83	2.68-2.95	2.54-3.11	2.75-2.89	
Sport Activity Index*** (0.04-7.29) without LBP	N	67	132	280	126	31	636	.009
	Mean	2.21	1.63	1.99	1.75	2.17	1.95	
	SD	1.49	1.30	1.43	1.35	1.42	1.40	
	95% CI	1.87-2.54	1.39-1.87	1.82-2.15	1.50-1.99	1.67-2.66	1.81-2.09	
Sport Activity Index** (0.04-7.29) with LBP	N	30	44	108	88	17	287	
	Mean	2.22	1.72	1.88	1.64	0.96	1.68	
	SD	1.66	1.44	1.37	1.43	0.89	1.43	
	95% CI	1.72-2.73	1.31-2.14	1.61-2.15	1.20-2.09	0.26-1.59	1.47-1.89	
Leisure Activity Index (1-5) without LBP	N	152	297	566	256	61	1416	.005
	Mean	2.56	2.62	2.62	2.59	2.62	2.61	
	SD	0.70	0.72	0.76	0.69	0.83	0.73	
	95% CI	2.44-2.67	2.53-2.70	2.56-2.68	2.50-2.66	2.44-2.81	2.55-2.65	
Leisure Activity Index (1-5) with LBP	N	68	127	228	105	95	596	
	Mean	2.54	2.47	2.57	2.48	2.50	2.52	
	SD	0.76	0.79	0.75	0.72	0.90	0.76	
	95% CI	2.36-2.71	2.34-2.60	2.47-2.67	2.29-2.58	2.44-2.59	2.44-2.59	

*Evaluated by analysis of variance (ANOVA);

** Evaluated for those participated in at list one sport activity.

Discussion

This study provides unique information about norms of habitual PA, using community-based data.³⁶ Findings demonstrate the actual levels of PA in a population, rather than the proportion of people who reach the WHO-recommended PA levels. Data distribution and the narrow width of 95% confidence intervals (none exceeded 10% of the means) support the assumption that the findings pertaining to this study population may provide a viable representation of other populations with similar characteristics.³⁷ To the best of our knowledge, as there is no evidence indicating any major changes in people's habitual PA levels over the past 15 years, it is assumed that the data collected in 2000 is relevant also today.

The norms found in this study were for the total BPAQ and for each of its three indices separately. This is important because previous studies have found relationship in opposite directions between medical conditions, such as heart disorders and LBP, and OAI and SAI scores.^{24,26} In those studies, heart disorders and LBP were directly related to high OAI and indirect related to high SAI.

Indeed, in the present study, there was no significant difference between any of the subgroups when mean scores of the total BPAQ were evaluated, except age group differences on the SAI. However, not unlike those of previous studies, also the current findings demonstrated differences between subgroups when each of the indices was evaluated separately. The norms presented here show differences between age groups, between gender groups and between patients with and without LBP. Therefore, PA levels of individuals or groups should be compared with the norms of a relevant subgroup.

The results of the present study support the use of the BPAQ, including a separate evaluation of each of the three indices (OAI, SAI and LAI), as a suitable tool for the evaluation of habitual PA in physical therapy settings. The norms presented here are of enormous relevance to physical therapy intake, treatment and recommendations. Clinicians, as well as researchers, can compare PA levels of individuals and groups to these norms. We strongly believe that a discussion of the patient's potential PA and the setting of program goals should be based not only on the WHO's recommendations, but also on the patient's habitual activity levels. Our experience indicates that whenever there is a large gap between intervention goals defined according to the WHO's recommendations and the individual's pre-intervention PA level, there is an increased risk that the intervention will fail. This situation is probably very common and it might be one of the reasons for the poor response to the WHO's recommendations.⁹ However, this risk can be averted, by taking into account and assessing the individual's actual PA level before embarking on an interventional program and by setting goals in relation to normative PA levels relevant to the patient's age, gender, socioeconomic background and medical conditions. In other words, we suggest that an individually graded program intended to increase PA should be designed based on the individual patient's habitual activity level prior to the intervention. It is assumed that determining the extent of the gap between current and normative PA levels may lead to better intervention outcomes. Consequently, awareness and assessment of the individual's current activity level as compared to relevant norms should be the first step in planning a program that aims to increase PA in daily life. Future studies should focus on populations with other specific medical conditions, such as post-polio survivors, adults with developmental disabilities, post-stroke patients and patients with physical disability due to orthopedic conditions.

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Limitations

The study has also some limitations. The proportion of white-collar, highly educated people is higher in the survey than in the general Israeli population.³⁶ Therefore, generalization of the results should be done with cautious. Another limitation derives from the difficulty to adjust the BPAQ scale to the level of PA recommended by the WHO. For that reason, it is not possible evaluate the gap between the current and the recommended levels of PA precisely. Finally, the BPAQ examines PA during the past year. Therefore, reports may be biased due to limited or inaccurate recall. Indeed, recent recommendations are to use the questionnaire to assess PA levels over a period of no more than the last six months.³⁵ In contrast, the authors of the current study accept the reliability of the BPAQ and claim that the existing evidence supports the assumption that if there is a recall limitation, its effect is negligible.^{14,16,17,18, 21, 24}

Conclusions

The BPAQ indices are a suitable tool for evaluating habitual PA in physical therapy settings. The norms of this tool should be used carefully taking into account the patient's age, gender, medical conditions and socioeconomic background. Comparing an individual's PA level to the relevant norms should be the first step towards planning a program to increase PA in daily life.

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