



Original research

What physical activity contexts do adults with psychological distress prefer?

Asaduzzaman Khan^a, Wendy J. Brown^b, Nicola W. Burton^{b,*}^a The University of Queensland, School of Health and Rehabilitation Sciences, Australia^b The University of Queensland, School of Human Movement Studies, Australia

ARTICLE INFO

Article history:

Received 12 July 2012

Received in revised form 2 October 2012

Accepted 26 October 2012

Keywords:

Exercise

Exercise therapy

Psychiatric

Environment

Stress

Mental disorders

Consumer preference

ABSTRACT

Objectives: Physical activity can promote well-being and assist in the prevention and management of psychological symptoms. The aim of this study was to identify what physical activity contexts are preferred by adults with psychosocial difficulties.

Design: Cross-sectional population based study.

Methods: Data were from a mail survey of 7873 adults aged 42–67 years. Psychosocial difficulties were assessed using the Kessler6, and categorized as no distress (0–7) or distress (8–24). Respondents indicated the extent to which they disagreed or agreed with a preference for each of 14 activity contexts, and were categorized as disagree, no preference, or agree. Data were analyzed using (1) descriptive statistics and (2) multi-level multinomial logistic regression with adjustment for sociodemographic and health variables; adjusted odds ratios and 95% confidence intervals are reported.

Results: Approximately 12% of respondents were categorized as psychologically distressed. Over 60% of distressed respondents disagreed with a preference for competitive activities; and agreed with a preference for activities that can be done close to home, involve little or no cost, can be done alone, are done outdoors, and that are not just about exercise. Distressed respondents had higher odds to prefer supervised activities (1.64; 1.32–2.03), activities done with people of the same sex (1.41; 1.12–1.78), and activities done at a fixed time with scheduled sessions (1.32; 1.08–1.62) than those without distress.

Conclusions: Mid-aged adults with psychological distress have specific physical activity context preferences. These preferences could be incorporated into the planning and promotion of physical activity opportunities for people with psychosocial difficulties.

Crown Copyright © 2012 Published by Elsevier Ltd on behalf of Sports Medicine Australia. All rights reserved.

1. Introduction

While the physical benefits of physical activity participation are well known, the psychosocial benefits are also important. Physical activity is associated with a reduced risk of poor mental health, and can alleviate symptoms of depression and anxiety, and enhance quality of life.¹ Being physically active can also alleviate secondary symptoms such as low self esteem and social withdrawal, as well as redress weight gain, impaired sleep, and poor physical health, which are common concurrent concerns among people with psychosocial difficulties.²

Physical activity has a high level of acceptability as a treatment option among people experiencing psychosocial difficulties.^{2,3} To support the development and promotion of physical activity interventions for this group, more research is needed to understand their needs and interests. Affective responses, such as enjoyment, are important influences on physical activity participation⁴; and

positive responses are more likely to be derived from activities consistent with people's interests than activities that are inconsistent. Although identifying the *type* of physical activities that people prefer is useful, an understanding of physical activity *context* provides more descriptive information. Someone may, for example, prefer walking as a type of activity, but also have specific preferences for how, where and with whom this is done. For people with little intrinsic interest in physical activity, the context in which it is done may be particularly important for engagement and adherence. Identifying the context of physical activity is consistent with various theories (e.g., social cognitive theory, social ecological theory) that highlight the role of the environment, setting, or situation as a determinant of behavior.

In a study of 120 patients receiving treatment for a psychiatric illness, Ussher et al.⁵ found that the majority preferred to exercise at home than at a facility, and that equal numbers preferred individual activities and group activities. The researchers did not however, explore other activity contexts; study participants had severe mental illness (e.g., schizophrenia, bipolar disorder, psychosis); and only descriptive results were presented. Other research has focused on motivating factors, perceived benefits

* Corresponding author.

E-mail address: nburton@hms.uq.edu.au (N.W. Burton).

and barriers to activity participation, and psychiatric patients with severe mental illness.^{6,7} Little research has been done to assess a range of physical activity contexts, with people in the general population who are experiencing psychosocial difficulties, or to compare people with psychosocial difficulties to those without.

The aim of this study was to identify what physical activity contexts are preferred by adults with psychosocial difficulties. To do this we used a population-based sample, examined the activity contexts commonly preferred by adults with psychological distress, and compared the preferences of distressed adults with those of non distressed adults.

2. Methods

Data were from the HABITAT study in Brisbane, Australia, which was awarded ethical clearance by the QUT Human Research Ethics Committee (3967H). Survey return was taken as informed consent. Details on the design, sampling and data collection for HABITAT have been published elsewhere.⁸ A multi-stage probability sampling design was used to select a stratified random sample of 200 Census Collectors' Districts (CCD) in Brisbane, the state capital of Queensland, Australia. From within each CCD, a random sample of 85 people aged 40–65 years was selected using data from the Australian Electoral Commission. A mail survey was administered during May–July 2007, and again in 2009, using a method that included advance mail notice, personalized mail, a thank you/reminder notice, resending to non-respondents, and a final letter to non respondents. From 17,000 eligible participants in 2007, 11,037 surveys were returned (68.5%). Between 2007 and 2009, 117 people were unable to be contacted, 54 withdrew, 11 died, and 11 moved overseas, leaving 10,844 eligible participants in 2009. Data were used from the 2009 survey as this was the first to assess activity context preferences.

Psychosocial distress was assessed using items from the Kessler (K6) scale. Respondents used a five point Likert scale (none of the time, a little of the time, some of the time, most of the time, all of the time) to indicate how often during the last four weeks they felt nervous, hopeless, restless or fidgety, so sad that nothing could cheer them up, that everything was an effort, and worthless. Responses were summed across items and respondents were categorized as no distress (0–7), or distress (8–24) using cut offs identified in other research.⁹ Scores above five have previously been shown to indicate non specific mental distress at a moderate, yet still clinically relevant level in the general population.¹⁰

Respondents also indicated the extent to which they agreed or disagreed with a preference for each of 14 physical activity contexts (see Appendix A) using a five point Likert scale (strongly disagree, disagree, no preference, agree, strongly agree).¹¹ Responses were categorized as *disagree*, *no preference*, or *agree*. Item development was guided by social cognitive theory which purports that behavior is influenced by environmental, behavioral and personal factors. When applied to understanding physical activity,¹² environmental factors include the social context (e.g., supervision, gender and age of companions) and the physical setting (e.g., outdoors, near home), and behavioral factors reflect attributes of the activity (e.g., intensity, skill level, format).

Questionnaire items were used to assess personal factors of sex, age, household composition, highest level of education completed, employment status, annual household income, overall health status, and height and weight (used to derive body mass index). Physical activity was assessed using items from the Active Australia Survey to indicate time spent in the previous week doing walking, vigorous physical activity, and moderate physical activity (excluding household chores and gardening).¹³ Responses were quantified in MET min/week as $([\text{walking minutes} \times 3 \text{ METS}] + [\text{moderate}$

$\text{minutes} \times 3 \text{ METS}] + [\text{vigorous minutes} \times 7.5 \text{ METS}])$, and categorized into one of the five levels.

Descriptive statistics were used to identify the activity contexts preferred by at least 60% of respondents categorized as distressed. To reflect the multistage sample selection, multilevel multinomial logistic regression analyses were conducted using GLLMM (generalized linear latent and mixed models) commands of Stata version 11.0 (StataCorp, College Station, TX, USA) to examine possible relationships between physical activity contexts and psychological distress. Such relationships were adjusted for socio-demographic and health variables which were significantly associated with the outcomes of interests at $p < 0.005$; this conservative p -value was used in order to deal with the potential increase of the likelihood of type I error due to large sample size. The estimation procedure used was numerical integration (10 integration points) with adaptive quadrature in order to obtain more reliable estimates of parameters. Disagreement with the activity preference was considered as the reference category for multinomial modeling and models comparing agreement with disagreement are presented. Adjusted odds ratios (OR) and 95% confidence intervals (CI) are reported, where $OR > 1$ is interpreted as a more likely preferred context and $OR < 1$ is interpreted as a less likely preferred context.

3. Results

Of the 10,844 surveys sent in 2009, 322 participants declined participation, 161 were ineligible (deceased, unable to respond), 2488 did not respond, and 7873 returned surveys with data (74% of eligible cases). The sociodemographic and health profile of respondents are provided in Table 1.

The proportion of people, by level of distress, indicating agreement/disagreement with each of the physical activity contexts is provided in Table 2. Approximately 85% of distressed respondents agreed with a preference for activities that can be done close to home and activities that involve little or no cost; and just over 70% agreed with a preference for activities that can be done alone. Approximately 60% of distressed respondents agreed with a preference for activities done outdoors and activities that are not just about exercise; and disagreed with a preference for activities that involve competition.

Distressed respondents had higher odds prefer supervised activities (1.64; 1.32–2.03), activities done with people of the same sex (1.41; 1.12–1.78), and activities done at a fixed time with scheduled sessions (1.32; 1.08–1.62), each of these associations was highly significant ($p < 0.001$). Distressed respondents also had a lower odds to prefer vigorous activities (0.80; 0.64–0.99) and activities that are “not just about exercise” (0.77; 0.60–0.99); the significance of these associations was marginal ($p = 0.04$). There were no significant associations between distress and preferences for activities that can be done alone (0.79; 0.60–1.03), are done with people the same age (1.03; 0.82–1.28), are done outdoors (0.77; 0.57–1.04), are done close to home (1.07; 0.68–1.66), are low cost (0.18; 0.82–1.70), are with a set routine or format (1.19; 0.95–1.51), are team-based (1.13; 0.88–1.45), involve competition (0.85; 0.66–1.09), or activities that require skill and practice (1.02; 0.82–1.28).

4. Discussion

This study examined the physical activity contexts preferred by mid-aged adults with psychological distress. It is innovative in that it involved a large population-based sample, assessed a range of physical activity contexts, and used multivariable analyses with adjustment for sociodemographic and health related variables such as age, sex, income, living arrangement, physical health, employment status, and physical activity level. A high proportion

Table 1
Sociodemographic and health characteristics of the respondent sample (*n* = 7873).

	<i>n</i>	%
Sex		
Males	3479	44
Females	4394	56
Age group (years)		
42–49	2345	31
50–59	3103	41
60–67	2145	28
Household composition		
Single, no children	1542	21
Single parent	490	7
Couple, no children	2357	32
Couple, with children	3003	41
Employment status		
Full time paid	3691	52
Part time/casual paid	1572	22
Not in paid work (unemployed, home duties)	724	10
Retired	1136	16
Highest educational qualification		
School only (up to 12 years)	3460	44
Certificate/diploma	2379	30
University degree	1994	25
Gross annual household income (AUD)		
<41,600	1681	25
41,600–72,799	1625	24
72,800–129,000	1992	29
130,000+	1462	22
General health status		
Excellent/very good	3212	42
Good	3088	40
Fair/poor	1364	18
Body mass index (kg/m ²)		
<25	3077	39
≥25–<30	2926	38
≥30	1781	23
Physical activity level (MET min/week)		
None (<90)	890	12
Low (≥90–<450)	1652	22
Recommendations+ (≥450–<900)	1313	17
High (≥900–<1800)	1610	21
Very high (≥1800)	2069	27
Psychological distress		
No distress (0–7)	6781	88
Distress (8–24)	909	12

of distressed people preferred activities done close to home, at little or no cost, alone, and outdoors; activities that are not just about exercise; and non competitive activities. Many of these preferences were also endorsed by a high proportion of respondents without distress. Distressed respondents were however, significantly more likely to prefer activities that are supervised, done with people of the same sex, and done at a fixed time with scheduled sessions than those without distress.

Approximately 85% of the distressed respondents preferred activities that can be done close to home and activities that involve little or no cost. Other studies have shown that people are more likely to use facilities located close to home than elsewhere.¹⁴ Geographical convenience reduces time and travel demands, which may be particularly important to those with psychosocial difficulties distress so as to minimize daily hassles. Low cost activities reduce financial demands. Our previous research indicated that the majority of mid-aged adults prefer low cost physical activities, including those with high income.¹¹ Among those with psychosocial difficulties, a preference for low cost activities may be even more salient given the high proportion who also experience socioeconomic disadvantage.¹⁵

In terms of the social setting, 71% of the distressed respondents preferred activities that can be done alone, and 64% indicated a preference *against* activities that involve competition. This is not consistent with Ussher et al.'s finding that equal numbers of

Table 2
Proportion of people who indicated agreement/disagreement^a with a preference for each physical activity context, by level of psychological distress.

	Psychological distress ^b	
	No distress ^c	Distress
Can do on my own		
Agree	71	71
Disagree	10	11
Done with people around my age		
Agree	45	50
Disagree	21	24
Done with people my own sex		
Agree	21	31
Disagree	35	31
Are team-based		
Agree	13	16
Disagree	54	54
Involve supervision (e.g., from a leader)		
Agree	19	30
Disagree	51	43
Can do close to home		
Agree	85	87
Disagree	4	5
Done outdoors		
Agree	63	59
Disagree	8	12
Involve competition		
Agree	18	15
Disagree	60	64
Require skill and practice		
Agree	26	26
Disagree	38	40
Have a set routine or format		
Agree	49	55
Disagree	20	19
Involve little or no cost		
Agree	74	83
Disagree	8	6
Done at fixed time with scheduled sessions		
Agree	40	50
Disagree	34	31
Are not just about exercise		
Agree	60	60
Disagree	14	16
Are vigorous		
Agree	38	32
Disagree	32	41

^a Respondents could indicate "no preference", so proportions do not total 100%.

^b Measured using the Kessler Scale (K6) with cut offs of 0–7 (no distress) and 8–24 (distress).

^c Referent category for multivariable analyses.

psychiatric patients preferred activities done alone or activities done in a group,⁵ and qualitative research highlighting the value of social interactions during activity interventions for adults with mental illness.¹⁶ These other studies, however, involved adults with severe mental illness, while we examined non specific psychological distress. Activities that can be done alone minimize reliance on others and may subsequently provide more flexibility for people to integrate physical activity within their daily routine. Among those with psychosocial difficulties, a preference for activities that can be done alone could reflect a fear of social discrimination, which has previously been identified as a barrier to physical activity among psychiatric patients.^{6,17} Psychologically distressed adults may have elevated social discomfort and low self esteem, and a subsequent desire to avoid social comparisons and reduce achievement demands, which is consistent with the preference against competitive activities. Qualitative research on physical activity interventions for adults with mental illness has also indicated the importance of a non competitive atmosphere.¹⁶

Approximately 60% of the distressed respondents in our study preferred physical activities done outdoors. Outdoor exercise can

have additional benefits for psychological wellbeing when compared with indoor activities,^{18,19} and can result in moderate short-term reductions in anxiety and stress.²⁰ Improvements in self esteem from outdoor activities may be higher in adults with mental illness than those without.²¹ “Being outdoors” or “in nature” can also contribute to feelings of safety in adults with mental illness.²²

A similar proportion (60%) of the distressed respondents preferred activities that “are not just about exercise”. As disinterest or dislike of exercise is a commonly reported barrier to participation among adults in the general population,^{23,24} physical activity options with elements in addition to exercise may enhance enjoyment and promote engagement. Less traditional forms of exercise (e.g., dance) may provide an atmosphere where good health or improved fitness is a byproduct and other attributes are highlighted, such as fun, connecting with nature, or an intellectual challenge. Other research has highlighted the value of social interactions during physical activity interventions for adults with mental illness.¹⁶

Distressed respondents had higher odds than those without distress to prefer supervised activities. This may reflect a need for extrinsic support. Ussher et al. reported that 68% of psychiatric patients surveyed indicated that they would receive little or no help to exercise, and 58% agreed that an instructor's help would increase level of exercise.⁵ Other research has indicated low levels of social support for exercise among women with depression.²⁵ Physical activity supervisors can motivate participation and enhance esteem and perceived competence,¹⁶ as well as provide feedback, and assist with goal setting and problem solving barriers, all of which have been positively associated with participation,²⁶ and may be compromised in times of psychological distress.

A desire for extrinsic support may also explain why distressed respondents were more likely to prefer activities done at a fixed time with scheduled sessions. Psychosocial difficulties are often characterized by feelings of helplessness and a lack of control, and a constant and familiar physical activity schedule may help counter this. Among adults with mental illness, a structured program of physical activity can help to normalize daily life and contribute to a sense of meaning and accomplishment.¹⁶

Distressed respondents were more likely than those without distress to prefer physical activities done with people the same sex. As psychosocial difficulties can be characterized by feelings of social anxiety and low self esteem, activities done with people of the same sex may be associated with less self consciousness and interpersonal demands than activities with people of the opposite sex. Another study found a preference for gender segregated exercise groups among adults with a body mass index (BMI) ≥ 25 ²⁷; and there is a high prevalence of obesity among psychological distressed adults.²⁸ Same sex activity companions may be perceived as more empathic with concurrent concerns, such as difficulties fulfilling gender role stereotypes (e.g., caregiver, income provider).

Although only marginally significant, distressed respondents were less likely to prefer vigorous activities. Disinterest in vigorous activities could reflect a desire to avoid strenuous movements seen as beyond the individual's capacity. Pain is a common complaint among people with mood and anxiety disorders,²⁹ and breathing difficulties are a common characteristic of anxiety disorders. Both of these concerns could contribute to a preference against vigorous activities.

A comparison of the baseline HABITAT respondent sample with national census data indicated under-representation of those with school only education, not in the workforce, and living in disadvantaged areas.³⁰ As these groups are also more vulnerable to psychosocial difficulties, our sample may therefore under represent these people. We used a generic measure of psychological distress (vs. e.g., specific diagnoses), and at this time there is no research to

indicate if physical activity context preferences vary by type of psychological symptoms. Activity context preferences may not reflect actual behavior, which can be influenced by other factors, such as available opportunities and logistics. As this study was conducted with mid-aged adults, results may not be generalizable to younger or older adults.

5. Conclusion

Physical activity participation can provide significant psychological benefits, and has a high level of acceptability as a treatment option among people experiencing psychosocial difficulties. Information on physical activity context preferences, such as with whom and in what format, can be used by health professionals and service providers who advocate for, promote, design, and implement physical activity programs. The results of this study suggest that adults experiencing psychosocial distress prefer activities that can be done close to home, involve little or no cost, can be done alone, are done outdoors, are not just about exercise, and activities that are not competitive. Physical activity opportunities specifically for mid-aged adults experiencing psychological distress should be gender segregated, supervised, and have scheduled sessions. Taking into account these context preferences may lead to more appealing physical activity opportunities for people experiencing psychosocial difficulties, and therefore higher levels of engagement and adherence.

Practical implications

- Mid-aged adults with psychosocial difficulties have specific preferences for how, where and with whom to do physical activity. Some of these are similar to the preferences of people without such difficulties, but some are different.
- Physical activities that are close to home, can be done alone, are outdoors, are not just about exercise, involve little or no cost, and are non competitive are more likely to appeal to mid-aged adults with psychosocial difficulties than other types of activities.
- Physical activities specifically for mid-aged adults experiencing psychosocial difficulties should involve gender segregated activities, supervision, and scheduled sessions.

Acknowledgments

The HABITAT study was supported by project grants from the (Australian) National Health and Medical Research Council (NHMRC) (ID 339718 and 497236). We acknowledge Professor Gavin Turrell for overall project leadership, Ms. Robyn Baguley and Ms. Sophie Miller for project management, and Mr. Martin O'Flaherty for assistance with data coding and cleaning. Nicola Burton was supported by a NHMRC Program Grant (569940).

References

1. U.S. Department of Health and Human Services. Physical Activity Guidelines Advisory Committee Report Part G. Section 8: Mental Health; 2008. http://www.health.gov/paguidelines/Report/G8_mentalhealth.aspx. Accessed 17 May 2012.
2. Richardson C, Faulkner G, McDevitt J, McDevitt J. Integrating physical activity into mental health services for persons with serious illness. *Psychiatr Serv* 2005; 56(3):324–331.
3. Parker G, Crawford J. Judged effectiveness of differing antidepressant strategies by those with clinical depression. *Aust N Z J Psychiatry* 2007; 41(1):32–37.
4. Rhodes RE, Fiala B, Conner M. A review and meta-analysis of affective judgments and physical activity in adult populations. *Ann Behav Med* 2010; 38(3):180–204.
5. Ussher M, Stanbury L, Cheeseman V, Cheeseman V. Physical activity preferences and perceived barriers to activity among persons with severe mental illness in the United Kingdom. *Psychiatr Serv* 2007; 58(3):405–408.

6. McDevitt J, Snyder M, Miller A, Miller A. Perceptions of barriers and benefits to physical activity among outpatients in psychiatric rehabilitation. *J Nurs Scholarsh* 2006; 38(1):50–55.
7. Sorensen M. Motivation for physical activity of psychiatric patients when physical activity was offered as part of treatment. *Scand J Med Sci Sports* 2006; 16(6):391–398.
8. Burton NW, Haynes M, Wilson L, Wilson L. HABITAT: a longitudinal multilevel study of physical activity change in mid-aged adults. *BMC Public Health* 2009; 9(1):76.
9. Kessler RC, Green JG, Gruber MJ, Gruber MJ. Screening for serious mental illness in the general population with the K6 screening scale: results from the WHO World Mental Health (WMH) survey initiative. *Int J Methods Psychiatr Res* 2010; 19(Suppl. 1):4–22.
10. Prochaska JJ, Sung H-Y, Max W, Max W. Validity study of the K6 scale as a measure of moderate mental distress based on mental health treatment need and utilization. *Int J Methods Psychiatr Res* 2012; 21(2):88–97.
11. Burton NW, Khan A, Brown WJ. How, where and with whom? Physical activity context preferences of three adult groups at risk of inactivity. *Br J Sports Med* 2012. Published on January 20, 2012 as doi:10.1136/bjsports-2011-090554.
12. Dziewaltowski DA. Physical activity determinants: a social cognitive approach. *Med Sci Sports Exerc* 1994; 26:1395–1399.
13. Australian Institute of Health Welfare. *The Active Australia Survey: a guide and manual for implementation analysis and reporting*. Canberra, AIHW, 2003.
14. Giles-Corti B, Donovan RJ. The relative influence of individual, social, and physical environment determinants of physical activity. *Soc Sci Med* 2002; 54(12):1793–1812.
15. Australian Bureau of Statistics. *Australian social trends*. Canberra, Australian Publishing Service, 2010.
16. Mason OJ, Holt R. Mental health and physical activity interventions: a review of the qualitative literature. *J Mental Health* 2012; 21(3):274–284.
17. Raine P, Truman C, Southerst A. The development of a community gym for people with mental health problems: influences on psychological accessibility. *J Mental Health* 2002; 11(1):43–53.
18. Thompson Coon J, Boddy K, Stein K, Stein K. Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environ Sci Technol* 2011; 45(5):1761–1772.
19. Bowler DE, Buyung-Ali LM, Knight TM, Knight TM. A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health* 2010; 10:456.
20. Mackay GJ, Neill JT. The effect of “green exercise” on state anxiety and the role of exercise duration, intensity, and greenness: a quasi-experimental study. *Psychol Sport Exerc* 2010; 11(3):238–245.
21. Barton J, Pretty J. What is the best dose of nature and green exercise for improving mental health? A multi-study analysis. *Environ Sci Technol* 2010; 44(10):3947–3955.
22. Priest P. The healing balm effect: using a walking group to feel better. *J Health Psychol* 2007; 12:36–52.
23. Reichert F, Barros A, Domingues M, Domingues M. The role of perceived personal barriers to engagement in leisure-time physical activity. *Am J Public Health* 2007; 97(3):1.
24. Tompkins TH, Belza B, Brown MA. Nurse practitioner practice patterns for exercise counseling. *J Am Acad Nurse Pract* 2009; 21(2):79–86.
25. Craft LL, Perna FA, Freund KM, Freund KM. Psychosocial correlates of exercise in women with self-reported depressive symptoms. *J Phys Act Health* 2008; 5(3):469–480.
26. Biddle S, Mutrie N. *Psychology of physical activity determinants, well-being and interventions*, 2nd ed. New York, Routledge, 2008.
27. Dunlop WL, Beauchamp MR. En-gendering choice: preferences for exercising in gender-segregated and gender-integrated groups and consideration of overweight status. *Int J Behav Med* 2011; 18(3):216–220.
28. Scott KM, McGee MA, Wells JE, Wells JE. Obesity and mental disorders in the adult general population. *J Psychosom Res* 2008; 64(1):97–105.
29. Williams LJ, Pasco JA, Jacka FN, Jacka FN. Pain and the relationship with mood and anxiety disorders and psychological symptoms. *J Psychosom Res* 2012; 72(6):452–456.
30. Turrell G, Haynes M, Burton NW, Burton NW. Neighborhood disadvantage and physical activity: baseline results from the HABITAT multi-level longitudinal study. *Ann Epidemiol* 2010; 20:171–181.