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Self-Reported Physical Activity and its Correlates among Adult Women in the Expanded Part of Thiruvananthapuram City, India

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Summary

Data on correlates of physical activity (PA) are limited in India. This study estimated the prevalence and correlates of PA among women. A cross-sectional survey was conducted among 1303 women (mean age 45 years) selected by multistage cluster sampling. Information was collected using a pretested interview schedule. Multivariate logistic regression analysis was used to determine the correlates of PA. Self-reported moderate or high level PA prevalence was 73.4% [95% confidence interval (CI); 71.1–75.9]. Women who perceived themselves as being underweight [odds ratio (OR) 3.68: 1.97–6.74]; had an exercising member in the household (OR 3.41: 2.52–4.66); had access to exercise facilities (OR 2.17: 1.63–2.95); were married (OR 2.14: 1.40–3.25), were in the age group of 35–54 years (OR 1.91: 1.32–2.63); reported having knowledge about the benefits of PA (OR 1.62: 1.13–2.25); and who reported having the support of friends and neighbors (OR 1.42: 1.05–2.01) were more likely to report PA than their counterparts.

Keywords

Community-based research; correlates; Kerala; physical activity (PA) prevalence; women

Physical inactivity, a leading cause of death globally, was responsible for 9% of premature mortality resulting in more than 5.3 million out of the 57 million deaths.¹ Several studies estimated the prevalence of physical activity (PA) among the general population at multiple sites in India^{2,3} that ranged 7.3–93.2%. Earlier studies from developed nations reported individual-level factors for PA, such as self-confidence; male sex; social factors such as

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family support, support from friends, and neighbors;⁴ and environmental factors such as urban planning, public transportation systems, parks, and trails⁵ as major positive correlates of PA. A recent systematic review of the correlates of PA identified 68 studies from low- and middle-income countries in which no study was from India.⁵ Data on correlates of PA are limited in India, while the problems of inactivity-related chronic diseases are substantial. Therefore, we conducted this community-based survey to understand the prevalence of self-reported PA and its correlates among women in the expanded part of Thiruvananthapuram city in Kerala.

We conducted a cross-sectional survey among women aged 18–64 years in the expanded part of Thiruvananthapuram City Corporation, during the period September 2011–January 2012 to identify sedentary women for an ongoing community-based PA promotion intervention trial. Anticipating that 20% more individuals in the intervention group (at least 150 minutes of moderate-intensity aerobic PA throughout the week or at least 75 minutes of vigorous-intensity aerobic PA throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity)⁶ than the control group at the end of intervention, sample size was estimated to be 94 with a confidence level of 95% and power of 80%. Taking loss to follow up and design effect of 2 individuals into account, the sample size had been increased to 400. In order to identify 400 sedentary women, based on the anticipated physical inactivity prevalence of 31.8% [Unpublished Master of Public Health (MPH) dissertation: Thirunavukarasu *et al.* Change in Cardiovascular Risk Factor Profile of a Rural Cohort in Thiruvananthapuram District in Kerala. 2008. Achutha Menon Centre for Health Science Studies (AMCHSS), Trivandrum], we had to survey 1258 women [(100/31.8)*400 = 1258].

Participants in this study were selected by multistage cluster sampling. Thiruvananthapuram City Corporation was expanded in the year 2010 by adding five panchayats (the lowest administrative unit in rural areas) located in the periphery of the city. In the first stage, two out of these five panchayats were selected. The five erstwhile panchayats in the expanded part of the city were distributed in three locations. In two locations, two erstwhile panchayats were contiguous. Among the contiguous ones, we selected one each randomly to carry out the survey. A residents' association is a formal community organization of the residents in a locality and their main role is supporting each other within the association on issues that are of public concern, including health. Residents' associations in both these erstwhile panchayats covered more than 95% of the households with an average of 93 households. In the second stage, 14 out of the 71 residents' associations were selected randomly to obtain the sample size of 1258. Those women who consented were included in the survey. Women with physical deformities, those who were bedridden, those who were pregnant and lactating, those who were less likely to reside in the area for the next 6 months, and those with disease conditions where PA was contraindicated were excluded from the survey.

Out of 1735 households in the residents' associations, we could identify participants from only 1323 households. Locked households were visited another time, and excluded if they remained locked at the time of the second visit. If there was more than one woman, one was

selected randomly. Data for 20 women were discarded because of incomplete information in the questionnaire, and the remaining 1303 were considered for analysis.

Ethical approval for the study was obtained from a national institute. Informed written consent was obtained from the participants before the commencement of the study.

PA was assessed using the Global Physical Activity Questionnaire (GPAQ), validated in India.⁷ Although this was not specifically validated in South India, the World Health Organization (WHO) have used GPAQ for their WHO-Indian Council of Medical Research (ICMR) noncommunicable disease (NCD) risk factor surveillance in six sites in India⁸ including South India. Low, moderate, and high PA levels were defined as <600, 600–2999, and ≥3000 metabolic equivalent task (MET) min per week respectively. The GPAQ captures activities of moderate and vigorous intensities at work, on transportation, and in the leisure and domestic spheres. Moderate-intensity and vigorous-intensity activities were assigned MET values of 4 and 6 respectively as per the GPAQ protocol. The product of the intensity (MET), frequency (per week), and duration (min) of each activity gives the total PA as denoted by MET minutes per week. Participants who had moderate and high levels of PA were considered “physically active” and those with low PA levels were considered “inactive.” Correlates of PA were assessed at intrapersonal, interpersonal, and community levels.

Data analysis was done using SPSS Version 17.0 (SPSS Inc: Chicago, Illinois, USA). Multivariate logistic regression analysis was performed for finding the correlates of self-reported PA, the dependent variable being PA as a binary variable (active/inactive).

The mean age of the study participants was 45 years. The mean level of PA among women was 1875 MET min/week. Out of the total of 1303 women, 957 [73.4%, 95% confidence interval (CI) 71.1–75.9%] reported moderate- or high-level PA. The association between self-reported PA and intrapersonal factors is given in Table 1, and factors at the interpersonal and community level are given in Table 2. Women who perceived themselves as being underweight, those who had an exercising member in the household, those who had access to exercise facilities, those who were married, those in the age group of 35–54 years, those who reported having knowledge about the benefits of PA, and those who reported having support from friends and neighbors were more likely to be physically active than their counterparts.

The physical inactivity prevalence of 26.6% among women in our study was higher than the inactivity of 8.7% reported in a study among urban woman in the age group of 15–64 years in the same city in 2006.⁸ A higher level of physical inactivity in the same population could be due to changing trends in the environment making it not conducive for PA due to heavy traffic, poor road safety, and increased television and motor vehicle use⁹ over the intervening period of 6 years.

The positive association of PA with middle age in our study was similar to one of urban Chinese women,¹⁰ where PA increased with age, in contrast to Australian women.⁴ Middle age is when women enter a new phase of family life and have increased levels of child care

and household responsibilities. In our study, nearly 74.7% of PA among middle-aged women was attributed to domestic chores compared to younger (64.8%) and older (68.6%) women.

Married women reported more PA in our study, which may be because those who were married may have more household responsibilities that are PA enablers compared to their single, separated, or widowed counterparts.

Women who perceived themselves to be overweight were less likely to be engaged in PA, similar to a study among older US women.⁵

Knowledge about the benefits of PA was found to be a strong correlate for PA. More than half (61.7%) of the participants were not aware of the recommendations for PA for health benefits. Studies elsewhere have shown that participants perceived diet to play a more important role in diabetes prevention than PA, and the low awareness of the role of PA in the prevention of diabetes and breast cancer.

Support from friends and neighbors was a strong correlate for PA in our study, similar to another study.⁴ Peer support and having friends may enable women to overcome individual-level barriers and increase the opportunity for leisure-time walking and other activities outside their normal routines. This finding throws light on the importance of group-based activities involving peers as an opportunity to promote PA among women in South India.

Women with an exercising member in the household were more likely to be active. A household member who exercises regularly may be aware of the benefits of PA and would help to overcome culture and gender norms that discourage women from undertaking walking at leisure or engaging in any outdoor activity that promotes PA. Constant reinforcement and accompaniment by a household member may be a facilitator for PA.

Access to facilities emerged as a significant correlate for PA at the community level, similar to another study,⁴ perhaps because more facilities for exercise influence the activity level positively. Facilities for PA could be in the form of exercise facilities, sports or recreation centers, parks and public spaces, and pedestrian walking zones. There is strong evidence from developed nations and developing nations such as Brazil of improvement in population-level PA by investing in public spaces, transportation policies, and land zoning.

The findings of the study may not be generalizable to the entire city, as the sample frame was the expanded part of the city. Self-reports of PA were not validated by an objective measure such as an accelerometer.

Conclusion

In conclusion, women who perceived themselves to be underweight, those who reported having an exercising member in the household, those who had access to exercise facilities, married women, those in the age group of 35–54 years, those who reported knowledge about the benefits of PA, and those who reported support from friends and neighbors were more likely to report PA than their counterparts. Assessments of correlates of PA may have to be done in different populations as there are cultural variations.

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Table 1

Association between self-reported PA[‡] and intrapersonal factors

Variables	Subcategories	N*	n** (%)	Unadjusted odds ratio (95%CI)	P value	Adjusted odds ratio (95% CI)	P value
Intrapersonal factors							
Age group (years)	<35	327	226 (69.1)	Reference	<0.001	Reference	0.01
	35–54	649	511 (78.7)	1.73 (1.22–2.23)		1.91 (1.32–2.63)	
Educational status	55+	327	220 (67.3)	0.91 (0.66–1.27)	0.551	1.13 (0.81–1.75)	0.33
	Up to high school	657	494 (75.2)	Reference	0.149	—	—
Occupational status	Higher secondary and above	646	463 (71.4)	1.17 (0.93–1.53)	0.308	—	—
	Unemployed	277	747 (72.8)	Reference			
Marital status	Employed	1026	210 (75.8)	1.20 (0.86–1.59)	<0.001	Reference	0.012
	Others	1155	83 (56.1)	Reference			
Perceived body weight	Married	148	874 (75.7)	2.43 (1.71–3.46)		2.14 (1.40–3.25)	
	Normal	816	624 (76.2)	Reference	0.142	Reference	0.351
Knowledge about the benefits of physical activity	Overweight	179	126 (71.6)	0.80 (0.54–1.13)	<0.001	0.82 (0.54–1.24)	<0.001
	Obese	144	056 (38.9)	0.19 (0.13–0.28)	<0.001	0.18 (0.10–0.24)	<0.001
Advice from the health professional	Underweight	164	151 (92.1)	3.63 (2.01–6.54)	<0.001	3.68 (1.97–6.74)	<0.001
	No	923	648 (70.2)	Reference	0.012	Reference	<0.001
Advice from the health professional	Yes	380	309 (81.3)	1.83 (1.37–2.47)	0.01	1.62 (1.13–2.25)	0.32
	No	754	516 (68.5)	Reference		Reference	
	Yes	549	441 (80.2)	1.87 (1.43–2.41)		1.39 (0.9–1.9)	

[‡]PA – Physical activity.

* N is the number of women under each category.

** n is the number of women physically active (individuals who reported either moderate or high levels of PA) in the same category.

Variables that were significant at the 0.05 level in the bivariate analysis were considered for the multivariate analysis

Table 2
Association between self-reported PA and factors at interpersonal and community level

Variables	Subcategories	N*	n** (%)	Unadjusted odds ratio (95% CI)	P value	Adjusted odds ratio (95% CI)	P value
Interpersonal factors							
Support from household members and spouse	No	1004	721 (71.8)	Reference	0.01	Reference	0.31
	Yes	299	236 (78.9)	1.54 (1.07–2.00)		0.88 (0.6–1.4)	
Support from friends and neighbors	No	922	646 (70.1)	Reference	<0.001	Reference	0.03
	Yes	381	311 (81.6)	1.92 (1.41–2.55)		1.42 (1.05–2.01)	
Exercising member in the household	No	539	317 (58.8)	Reference	<0.001	Reference	<0.001
	Yes	764	640(83.8)	3.54 (2.72–4.50)		3.41 (2.52–4.66)	
Household member having a chronic disease	No	792	545 (68.8)	Reference	<0.001	Reference	0.27
	Yes	511	412 (80.6)	1.93 (1.44–2.46)		0.91 (0.6–1.3)	
Community-level factors							
Access to facilities	No	536	361 (67.4)	Reference	<0.001	Reference	<0.001
	Yes	767	596 (77.7)	1.73 (1.31–2.16)		2.17 (1.63–2.95)	

[†] PA – Physical activity.

* N is the number of women under each category.

** n is the number of women physically active (individuals who reported either moderate or high levels of physical activity) in the same category.

Variables that were significant at 0.05 level in the bivariate analysis were considered for the multivariate analysis.