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Assessment of Household Work as Compensation for Physical Activity Deficit Amongst Older Adults in a Nigerian Urban Setting

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Abstract

Urban older adults tend to be physically inactive and often remain indoors. Household work of a sample of 300 urban-dwelling adults (50-65 years) from a Nigerian state capital was therefore investigated for physical activity (PA) levels. Questionnaire on participation in household tasks, time and days/week for the tasks, awareness of health benefits of PA and household work as exercise was used. Greater participation occurred in household chores than outdoor/yard work (70.0 vs 44.0%) while participation varied with specific chores (55.0-70.0%) and yard work (28.7-34.0%). Gender, education, age and living with spouse or children/helper were associated with performance of household chores ($P < 0.05$) as well as with yard work except living with spouse. Prevalence of low-intensity household PA was high with only 0.9-13.8% attaining moderate-intensity level and no vigorous-intensity. Low prevalence of awareness of PA health benefits (32.3%) and household work as exercise (14.4%) was observed, but were related to good performance of household work (OR, 1.50-1.55; CL, 0.55-3.54). The finding that 13% of the respondents attained moderate-intensity PA indicated the potential of household work to compensate for the absence of other physical activities. Thus public health campaigns based on household work as exercise in a gender sensitive African society becomes necessary.

Keywords: Household Chores, Yard Work, Physical Activity, Older Adults, Urban Centre

1. Introduction

The advantages of physical activity (PA) especially as it concerns prevention and retardation of non-communicable diseases have been demonstrated in several reports (e.g. Kokkinos 2012; Reiner, Niermann, Jekauc & Woll, 2013; Elmagd 2016; WHO, 2018; Gesinde, 2019). Despite the well documented benefits, physical inactivity remains widespread across the world especially among older adults (WHO 2018). Non-communicable diseases are increasing in sub-Saharan African (SSA) countries and one of the risk factors is physical inactivity (Gouda et al. 2019). There are indications that the PA levels of adults and youths in low-income countries including SSA are generally below the minimum requirement (Hallal et al. (2012). With

respect to Nigeria, the prevalence of physically active individuals tends to vary from low to high (16.4-78%) depending on the setting and the population investigated (Owoeye et al. 2013; Akarolo-Anthony & Adebamowo, 2014; Ejechi & Ogege 2015; Adeniyi et al. 2016; Oyeyemi et al. 2013; 2018). Reports from other SSA countries also tend to follow a similar trend (Assah et al. 2015; John et al. 2017; Mashili et al. 2018; Mengesha et al. 2019).

While rural dwellers in SSA are physically active due to the manual physical labour associated with farming, grazing hunting and fishing (Ejechi, 2013; Assah et al. 2015; John et al. (2017; Mashili et al. 2018), the same cannot be said of many urban inhabitants especially white collar workers and shopkeepers who spend most of the time on the desk (Biswas et al., 2018; Azevedo et al., 2020). Economic factors, congestion, unplanned neighbourhoods, and insecurity tend to limit leisure and recreation PA in SSA (Juma et al. 2019; Barr et al., 2020), thereby leaving transportation and household work as potential contributors to total PA of older adults. Use of private vehicles and proximity to workplaces can limit transportation PA. Participation in household chores and yard work is open to persuasion whereas it will not be easy to persuade people to abandon their vehicles and to ride bicycle or trek to their offices or shops. Household work (chores and outdoor/yard work) can contribute to total PA levels as some studies have shown (Phongsavan 2004; Murphy et al. 2013; Nicklett et al., 2016) and provide health benefits (Fransson 2003; Shi et al. 2015; Scott et al., 2020; Park et al. 2020). This is important for older adults because physical inactivity makes them vulnerable to diseases the signs of which may begin in early old age.

There is paucity of information on the participation level of urban-dwelling older adults in household chores and yard work in Nigerian and SSA settings where traditional gender division still prevails. Information on the level of participation is essential for identifying areas for intervention in order to promote household work as beneficial to health. The study therefore focused on: (1) the prevalence and level of participation in household chores and outdoor/yard works of urban-dwelling adults in early old age; (2) the intensity of the PA arising from the household activities; and (3) the factors hindering participation in household chores and yard work.

2. Method

2.1 Data Source

Information for the study was obtained from randomly selected 300 respondents in early old age (50-65) from two cities including Asaba the capital of Delta State, Nigeria. Information sought from the respondents were participation in household chores and yard work, knowledge of the benefits of physical activity and socio-demographic characteristics (gender, age, education, marital status, children/house help and house) using structured questionnaire. The questionnaires were administered face-to-face by research assistants after obtaining verbal consents of the respondents. Pidgin English was used for interpretation when necessary.

2.2 Measures

The extent of participation in indoor household chores was determined using a list of 5 tasks which include kitchen work (cooking, washing dishes), sweeping indoor, washing clothes, ironing clothes and mopping/cleaning floor. Respondents were requested to rate their participation/performance in each of the 5 tasks on a scale of 4: (1, I do not; 2, Once in a while; 3, Most of the time; 4, All the time). The same scale was used for 3 identified tasks of yard (outdoor) works (Garden/weeding, sweeping outdoor, washing vehicle). The maximum available points for chores and yard work tasks stood at 24 and 12, respectively. The presence of features for outdoor/yard work (lawn, garden, flowers, vehicle for washing and sweeping areas $\geq 20 \times 20$ m) was indicated by "Yes" or "No" responses. The MET-minutes/week values of the household work PA of the respondents were assessed using the IPAQ (2005) protocol. In line with this procedure, respondents were asked to estimate the time (minutes) and the number of days in a week that the household tasks were undertaken. Respondents indicated awareness or non-awareness of the health benefits of PA with a "Yes" or "No" answer to the question: "do you know that PA can prevent or reduce the effect of non-communicable diseases like diabetes, obesity and heart problems?" Respondents were also requested to answer "Yes" or "No" to the question: "do you consider household chores and yard works physical exercises?"

2.3 Data analysis

Prevalence of participation was computed from the number of respondents that perform each of the household chores and yard work. The association between the socio-demographic characteristics and the level of participation (based on performance scores) in the chores and yard work was analysed with chi square statistics. Scores $\leq 50\%$ and $>50\%$ of maximum available points were adopted as “Poor” and “Good”, respectively, and used for the cross-tabulation. IPAQ (2005) procedure was used for calculating MET-min/week scores where the recommended MET values for household inside chores and yard work are 3.0 and 4.0, respectively. These values were multiplied with the time (minutes) taken to perform the tasks and the number of days the tasks were performed in a week (MET x minutes x days/week). By IPAQ recommendations, scores of 600-1500 MET-min/week is considered moderate-intensity PA while below and above stood at low- and vigorous-intensity levels, respectively. These values formed the basis of calculating prevalence of respondents with low or moderate-intensity PA. The relationship between the awareness of the benefits of PA, consideration of household work as physical exercise (independent variables), and scores from performance of household tasks (dependent variables) was analysed by logistic regression. SPSS version 21 was used for the statistical analyses.

3. Results

As can be seen in Table 1, respondents living with spouse, children/helpers and living in multiple families' buildings (block of flats) were more than 60% of the sample population. Males were more than females by 12% while respondents with secondary or tertiary education were markedly greater than those with primary education (Table 1). The number of respondents decreased with increasing age (Table 1). The prevalence of participation in household indoor chores and outdoor/yard works is presented in Figure 1. Participation in indoor chores was generally high ($\geq 55\%$) among the respondents with just 30% reporting non-participation. In contrast, prevalence of participation in outdoor/yard works was low ($<35\%$) with over 60% reporting non-participation. Prevalence of outdoor features for yard work was markedly lower in multiple family buildings when compared to single family detached buildings (Figure 2). The number of houses with lawns, gardens or flowers was less than 35% with no presence of lawn in any multiple families building (Figure 2). The median and range values of the time and days

Table 1: Socio-demographic characteristics of respondents

Variables		Respondents	
		N=300	%
Gender	Male	168	56.0
	Female	132	44.0
Education	None/primary	58	19.3
	Secondary	125	41.7
	Tertiary	117	39.0
Age	50-55	125	41.7
	56-60	101	33.6
	60-65	74	24.7
Living with spouse	Yes	187	62.3
	No	113	37.7
Living with children/helper	Yes	207	69.0
	No	93	31.0
Type of house building	Detached ^a	105	35.0
	Block of flats ^b	195	65.0

^aSingle family building; ^bMultiple family building

Figure 1: Prevalence of participation in household work

Figure 2: Availability of household outdoor features for yard work (n: detached building, 105; block of flats building, 195; *outdoor space $\geq 20 \times 20\text{m}$)

taken to perform the household works varied with the type of chores and outdoor works (Table 2). The duration (mins/week) for performing kitchen work, washing clothes and outdoor sweeping was the highest (Table 2).

Table 2: Duration of performance of household chores and outdoor/yard works

Household work		<i>n</i>	Duration (mins)	Days/week	*Median mins/week
			Median (range)	Median (range)	
Indoor chores	Kitchen work	206	30(15-90)	5(3-7)	150
	Sweeping	185	10(5-30)	3(1-7)	30
	Washing clothes	195	45(30-90)	2(1-3)	90
	Ironing clothes	210	30(10-60)	2(1-3)	60
	Cleaning floor	165	15(10-60)	2(1-3)	30
	No participation	90	0	0	0
	Gardening/weeding	86	45(30-90)	1(1-2)	45
	Sweeping	93	30(10-60)	3(1-5)	90
Outdoor work	Washing vehicles	102	15(10-30)	3(1-7)	45
	No participation	198	0	0	0
Total		NA	NA	NA	540

*Calculation was based on median values of minutes and days/week. NA, Not applicable

Prevalence of poor and good performance of household chores was nearly even by overall assessment (Table 3). In contrast, prevalence of poor performance of yard works was nearly 60% also by overall assessment (Table 3). All background characteristics except types of house were significantly associated with performance of inside chores (Table 3). Respondents living without spouse or children/helpers, with lower education, of younger age and females were more prevalent in the good chores performance category (Table 3). A similar trend was observed with yard work except, gender and presence/absence of spouse that were not associated with performance score (Table 3).

Table 3: Chi square analysis of the association between socio-demographic characteristics and level of participation in household work

Background characteristics		^a Participation/Performance score					
		Indoor chores [<i>n</i> (%)]			Outdoor/yard work [<i>n</i> (%)]		
		Poor	Good	X ²	Poor	Good	X ²
Gender	Male	132(78.6)	36 (21.4)	10.63*	100(59.5)	68(40.5)	1.26
	Female	81(61.4)	51(38.6)		70(53.0)	62(46.9)	
Education	None/primary	13(22.4)	45(77.6)	188.85**	10(17.2)	48(82.7)	183.79**
	Secondary	48(38.4)	77(61.6)		60(48.0)	65(52.0)	
	Tertiary	57(48.7)	60(51.3)		70(59.8)	47(40.2)	
Age	50-55	53(42.4)	72(57.6)	154.53**	75(60.0)	50(40.0)	183.79**
	56-60	39(38.6)	62(61.2)		75(74.2)	26(25.7)	
	60-65	54(72.9)	20(27.0)		60(81.1)	14(18.9)	
With spouse	Yes	90(48.1)	97(51.9)	11.45*	107(57.2)	80(42.8)	3.80
	No	32(28.3)	81(71.7)		51(45.1)	62(54.9)	
With children/helper	Yes	133(64.3)	74(35.7)	24.75**	135(65.7)	72(34.8)	18.39**
	No	31(33.3)	62(66.7)		36(38.7)	57(61.3)	
Type of house	Detached	71(67.6)	34(32.4)	3.27	63(60.0)	42(40.0)	3.23
Building	Block of flats	111(56.9)	84(43.1)		137(70.3)	58(29.7)	
All respondents		152(50.6)	148(49.3)		171(57.0)	129(43.0)	

^aPerformance score: Poor= ≤50% max points; Good>50% max points. Max available points: indoor chores, 24; outdoor/yard, 12 (See Method). Significance: **P*<0.01; ***P*<0.001

The results in Table 4 show that on the average, less than 10% of the respondents with background characteristics-based variation range of 0.9-13.8% met the recommended MET-min/week value for moderate-intensity PA level. Vigorous-intensity PA level was not attained. The table further shows that respondents

having tertiary education were the least (<1.0%) that met the moderate-intensity level while those living without children/helpers, having none or primary education and living in detached (single family houses) were greater.

Table 4: Prevalence of respondents in MET-min/week values arising from inside and yard household work

Background characteristics		n	Prevalence (%) of respondents with:	
			Low PA (<600 MET-min/week)	Moderate-intensive PA (≥600 MET-min/week)
Gender	Male	168	94.0	6.0
	Female	132	91.7	8.3
Education	None/primary	58	86.2	13.8
	Secondary	125	90.4	9.6
	Tertiary	117	99.1	0.9
Age	50-55	125	90.4	9.6
	56-60	101	93.1	6.9
	60-65	74	97.3	2.7
With spouse	Yes	187	94.7	5.3
	No	113	90.3	9.7
With children/helper	Yes	207	95.7	4.3
Type of house	No	93	87.1	12.9
	Detached	105	86.7	13.3
All respondents	Block of flats	195	96.4	3.6
		300	93.0	7.0

On the average and by overall assessment, the prevalence of the awareness of the benefits of PA was generally low (<40%) except with higher education respondents which were slightly more than 50% (Table 5). A similar trend was observed with respect to considering household chores and yard works as physical exercises but on this occasion higher education respondents were lower than 50% (Table 5). Logistic regression analysis showed that knowledge of the benefits of PA and consideration of household work as physical exercises were significantly associated with good performance of household chores and yard work (Table 6).

Table 5: Prevalence of the knowledge/awareness of the health benefits of physical activity and household work as physical exercise by socio-demographic characteristics

Background characteristics		n	Prevalence (%)			
			PA as health benefit		Household chores/yard works as physical exercises	
			Yes	No	Yes	No
Gender	Male	168	41.7	58.3	9.5	90.5
	Female	132	20.4	79.6	5.3	94.7
Education	None/primary	58	8.6	91.4	10.3	89.7
	Secondary	125	23.2	76.8	12.0	88.0
	Tertiary	117	53.8	46.2	43.6	56.4
Age	50-55	125	28.8	71.2	4.0	96.0
	56-60	101	35.6	64.3	6.9	93.1
	60-65	74	33.8	66.2	21.6	78.4
All respondents		300	32.3	67.7	14.4	85.6

Table 6: Logistic regression analysis of the relationship between awareness of the health benefits of PA, household chores/yard work as physical exercise and participation in household work

Knowledge/awareness of:		Household work score	Odds Ratio	95% CL
Benefits of PA	No	Poor	1.0	
		Good	1.03	0.32-2.30
	Yes	Poor	1.0	
		Good	1.55*	0.55-3.54
Household chores/yard work as physical exercise?	No	Poor	1	
		Good	0.85	0.20-1.65
	Yes	Poor	1	
		Good	1.50*	0.60-3.45

* $P < 0.05$

4. Discussion

The high prevalence of respondents participating in household inside chores was not unexpected because the tasks are mostly routine activities that are essential to daily living. In contrast, participation in yard work especially gardening was low and this can partly be attributed to its being undertaken for aesthetics, social or leisure-time activity (Ashton-Shaeffer & Constant, 2006) which may not be regular. This is buttressed by the finding that the time and days taken to perform indoor chores was generally markedly greater than it took for yard works. Further evidence supporting this observation comes from the scores of participation in chores and yard work where the prevalence of poor performance was markedly higher in yard work. Yard work entails substantial PA depending on the task involved. Reports have shown that PA from gardening is on the average low- to moderate-intensity although tasks involving full body movement (e.g digging and weeding) may be of vigorous-intensity (Nicklett et al. 2016).

A combination of chores and yard work failed to attain moderate-intensity level in over 80% of the respondents thereby indicating the need to engage more in yard work because it is more energy-consuming. This is important because reports have shown that household work PA can attain moderate intensity levels (>600 MET-mins/week) or 150 mins/week (Phongsavan et al. 2004; Murphy et al. 2013; Park et al. 2020). Some background characteristics tend to influence performance of household chores and yard work as indicated by the chi square analysis and the variations in the prevalence of low and moderate-intensity PA. The better performance of females in household works is a reflection of traditional African gender division where household work is seen to be the responsibility of women. Indeed it has been reported that household work is the largest contribution to the total PA of women whereas it is low in men (Phongsavan et al. 2004; Murphy et al., 2013). Advancing age as a limiting factor to participation in household work was not unexpected due to ageing factors and most importantly the African tradition which regards participation of elders in domestic work as unusual. It was also not unexpected that respondents living with spouse, children or helpers would perform worse because the household tasks may be fully performed by the children or helpers. Another factor that reduced the household PA is the type of building occupied by the respondents. Energy exerting outdoor task features such as gardening, maintaining lawns and flowers were almost absent in multiple family buildings because of lack of space; and even in single-family detached buildings with space, less than 40% had these features. This probably explains the finding that over 60% of the respondents did not participate in yard work.

Lower education respondents tended to perform the household works better despite the fact that they report ignorance of the health benefits of PA and household work as physical exercise. The contradiction here is that higher education respondents with a substantial population (>50%) that are aware of PA benefits and regarded household chores/yard work as PA were poor participants in household works. This suggests that they may be in good economic positions to afford the services of helpers/paid labourers and therefore consider it *infra dig* to undertake household work. Indeed less than 1.0% of them attained moderate-intensity PA level whereas those with none or primary education were nearly 14%. Although it has been reported that those having knowledge of the health benefits of PA are usually more physically active (Williamson, 2016; Fredriksson et al. 2018; Abula et al., 2018), it is not the case concerning respondents with tertiary education in this study. However, the

importance of knowing the benefits of PA was still indicated because by overall assessment a significant association between awareness of PA health benefits and good performance of household work occurred.

It is clear that household PA is severely limited amongst the urban-dwelling older adults in the Nigerian setting. As noted earlier, Nigerian urban settings with its insecurity, congestion and poor neighbourhood layout restricts leisure and recreational PA. The only other source of PA is transportation and the fact that overwhelming majority of the respondents (especially those living in single family buildings) possess vehicles can also limit the PA arising from trekking or cycling. The implication is that older adults are most likely to face ill-health risks associated with insufficient PA. However increased participation in household chores and yard work can fill the PA gap left by other low PA levels as was observed by Stephan et al. (2016). These findings and the implications need to be brought to the attention of the community in order to increase participation in household chores and yard work. The key areas emerging from this study for PA promotional intervention by public health agencies are gender division, awareness of PA health benefits, acknowledgement of household work as physical exercise and housing environment. Promotion of “green environment” by ensuring that housing building plans provide adequate space for gardens or lawns will go a long way in enhancing household PA. The finding that some older adults’ PA reached the recommended levels (moderate-intensity/150-300 mins/week exercise) indicated that sufficient PA is available in household chores and yard work to meet WHO recommendations.

5. Conclusion

The results indicated that prevalence of participation in household chores and outdoor/yard work was generally low with a corresponding predominantly low-intensity PA. However, the observation that 0.9-13.8% of them attained moderate-intensity PA level with the household work, suggests that household work alone can be sufficient to attain recommended PA levels if fully performed. The report by Stephan et al. (2016) that household work can compensate for PA deficits is therefore substantiated in this Nigerian setting. However the limiting factors that require attention or intervention are gender division, awareness of PA health benefits, acknowledgement of household work as physical exercise and housing environment; and these can be addressed in health promotional campaigns by public health agencies.

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