Perceived Environmental Support for Physical Activity among University Administrative Workers: Implications for Social Entrepreneurship

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Abstract

The objective of this study was to (1) determine the physical activity (PA) levels of university administrative staff and (2) explore perceived environmental factors associated with meeting the current public health recommendations for PA. This cross-sectional survey involved 318 university administrative staff of the University of Cape Coast, Ghana (162) and the Enugu State University of Science and Technology, Nigeria (156). Participants' PA levels were assessed with the World Health Organisation's (WHO) International Physical Activity Questionnaire (IPAQ) short form. Additionally, researcher developed questionnaire measured participants' perceived environmental support for PA. Pearson chi-square was used to analyse participants' characteristics and PA levels. Bivariate and multivariate logistic regression analyses were used to explore the association of perceived environmental support and meeting public health recommendations (PHRs) for PA. Results indicate that about 13% of the workers exhibited low PA, 79.6% moderate and 7.5% high at p > .05. Besides, young workers (d" 44 years) were 1.06 more times likely to meet PHRs for PA (÷² = 11.91, OR = 1.06, p = .04, 95% C.I. = 1.002-1.125) than older ones (e" 45 years). Participants with high perceptions of the availability of sporting facilities at their workplaces for PA were more likely to meet PHRs for PA than those with low perceptions (÷² = 8.21, OR = .22, p = .004, 95% C.I.). Majority of the workers are not meeting PHRs for PA. There is association of multiple environmental variables rather than a single variable to PA participation.

Key Words; Physical activity, physical and social environmental support, social entrepreneurship

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INTRODUCTION

The developing world is witnessing an upsurge in chronic health conditions such as overweight/obesity, hypertension, diabetes and stroke, conditions considered to be associated with the developed world (Arnudha, Aucott, Clarke, & Smith, 2012; Withall, Jago, & Fox, 2012). These chronic illnesses are being associated with the general decline physical activity (PA) participation in all ages and genders (Bamana, Tessier, & Vuillemin, 2008; Erlichman, Kerbey, & James, 2002). However, regular PA involvement has been articulated globally because of its health promotive efficacy (Craig, 2003). Regular PA can reduce hypertensive (Beune, Haafkens, Agyemang, & Bindels, 2010), high cholesterol (Menyanu, & Ogah, 2012), arthritis, overweight and obesity, diabetes (Erlichman, et al., 2002; Lemon, Zapka, & Rosal, 2009) and many more health conditions. Regular PA is very important for all humans but mostly those whose jobs predispose them to sedentary life, such work group like university administrative staff.

Social ecological models of health behaviour suggest that PA behaviour is influenced by individual's biological status, social and physical environment and policy (Sallis, et al., 2006). But it is somehow difficult to objectively measure environmental variables to draw a meaningful research conclusion (Griew, et al., 2013). The physical environment such as our neighborhoods and communities where we live, learn, work and play is noted to either promote or demotivate individuals to engaging in PA regularly (Eriksson, Arvidsson, & Sundquist, 2012). In addition, a positive social environment, where individuals are encouraged by friends and family members contribute to engaging in regular PA by all persons (Morton, Wilson, Perlmutter, & Beauchamp, 2012).

Although there are compelling evidence of the health benefits regular PA (Erlichman, et al., 2002; Lemon, et al., 2009; Sallis, et al., 2009ab), the trend is declining among working class (Prodaniuk, Plotnikoff, Spence, & Wilson, 2004). The decline in PA trend is attributed to the perceptions of lack of or inadequate environmental support for engaging in such activities (Bamana, et al., 2008). This situation can be resolved by the interventions of social entrepreneurship (Dryton, Brown, & Hillhouse, 2006; Tucker, Fenton, Peckham, & Peeling, 2012).

Despite the decline in regular PA participation among office working class (Prodaniuk, et al., 2004), there is no empirical evidence establishing the extent to which environmental support perceptions influence university administrative staff's towards PA participation. In addition, there is no research measuring PA participation among two West African University administrative staff.

Therefore, the purposes of this study were to (1) determine the PA level of the administrative staff of UCC and ESUT (2) explore environmental support factors perceived to be associated with meeting the current PHRs for PA and influence of subjective health status in this association.

METHOD

Participants and Sample

This study cross-sectionally surveyed 318 administrative staff of University of Cape Coast, Ghana (n = 162, 50.9%) and the Enugu State University of Science and Technology, Nigeria (n = 156, 49.1%). The participants were selected randomly from over 3000 junior and senior administrative staff of the two universities (Documentation and Information Section, University of Cape Coast, 2012).

Measures and Statistical Analysis

World Health Organization's International PA Questionnaire (IPAQ) short form (WHO, 2005) was used to assess the frequency and duration of past-week walking, moderate-intensity and vigorous-intensity PA that lasted for at least 10 minutes. The IPAQ has shown to be valid and reliable across developed and developing countries with different populations (Bauman, et al., 2009; Ekelund, et al., 2005). The workers were asked to consider all PA at work, at home and during leisure time. Classification of PA participation is done at three levels by the use of algorithms provided in the short-form scoring protocol version of November 2005, developed by the IPAQ group (WHO, 2005). The three categories used in this study are as follows:

1. Low: (a) No activity reported or (b) Some activity reported but do not meet any of the categories in (2) or (3) below (WHO, 2005)
2. Moderate (any of the following standards): 5 or more days of combination of walking, moderate or vigorous-intensity activities achieving a minimum of at least 600 Metabolic Equivalent Task (MET)-min week (WHO, 2005).
3. High (any of the following criteria): 7 or more days of combination of walking, moderate or vigorous-intensity activities, accumulating at least 3000 MET-min week (WHO, 2005). Participants in 'High' PA category were deemed to meet PHRs for PA. Thus, they have researched health-enhancing PA threshold (WHO, 2005).

A three point Likert scale instrument subjectively measured participants' perceptions about the environmental support (physical and social) for PA. For physical environmental support items, participants responded "very true" (3), "partially true" (2) or "not true" (1), to positive items. Moreover,

they responded "very much" (3), "not much" (2) or "not at all" (1) to positive items to answer items on social support environment. Participants' background information such as age, gender, marital status, perceived health status and highest educational level attained were also collected.

Frequency counts and percentage were used to describe the dichotomous characteristics of the workers while mean and standard deviation used for continuous variable (age). Pearson Chi-square test was used to determine the level PA participation according to the characteristics of the workers from the two universities.

Procedure

Approval was sought form the University of Cape Coast Institutional Review Board (IRB). In addition, the registrar of UCC authorized this study. The attendants were contacted at their offices where their voluntary participation was solicited. Participants completed an informed consent form attached to the questionnaire. The form described the purpose, extent of involvement in the study, assured confidentiality and voluntary participation. In addition, bivariate and multivariate logistic regression analyses were calculated to determine which factors predict PA participation among the workers. All statistical analyses were significant at 0.05 or 95% confidence interval (C.I.).

RESULTS

Three hundred and eighteen university administrative staff, comprising 162 (50.9%) UCC and 156 (49.1) ESUT, were studied to determine their PA levels and how the perceptions about their environment influence that. Out of 318 workers, 164 (51.6%) males and 154 (48.4%) females with age ranged of 22 to 58 were surveyed. Of 162 UCC staff, 83 (26.6%) were married while 79 (224.8%) were single. Besides, there were 115 (36.2) and 41 (12.9) married and single ESUT staff respectively, involved in this study. About 13% percent of the subjects exhibited low PA, 79.6% moderate level and 7.5% high, corresponding to meeting PHRs for PA or Health-Enhancing PA threshold (Bamana, et al., 2008; WHO, 2005). For the high level PA, the highest percentage was found in UCC (4.7%) with the lowest in ESUT (2.8%) at $p > .05$.

Factors Associated with Meeting PHRs for PA

Bivariate logistic regression analysis results in Table 2 and 3 indicated that young university administrators (d" 44 years) were 1.06 more times likely to meet PHRs for PA ($\div^2 = 11.91$, OR = 1.06, p = .04, 95% C.I. = 1.002-1.125) than older ones (e" 45 years). The likelihood of meeting PHRs for PA also increased with the corresponding increase in the educational status of the participants. Thus,

master's ($\div^2 = 5.32$, OR = 5.1, p = .02, 95% C.I.) and Diploma/First Degree ($\div^2 = 5.85$, OR = 3.23, p = .02, 95% C.I. respectively. In addition, perceptions of physical environment suggested that participants with high perceptions about the availability of sporting facilities at their workplace for PA were more likely to meet PHRs for PA than those with low perceptions ($\div^2 = 8.21$, OR = .22, p = .004, 95% C.I.). However, we found no association of the perceptions of opportunities offered by area of residence, local sporting clubs and local authorities providing opportunities for PA. Furthermore, we found no association of the perception of social environment and meeting the current PHRs for PA.

The multivariate logistic regression analyses (shown in Table 4) revealed that after adjusting for age, gender, educational, marital and health status, perceptions about the local authorities providing opportunities and availability of sporting facilities at workplace for PA were significant in determining who meet PHRs for PA. And that, participants who perceived highly that their local authorities provide many opportunities for engaging in regular PA were 5.5 times more likely to meet PHRs for PA than those with low perceptions ($\div^2 = 4.35$, OR = 5.5, p = .04, 95% C.I. = 1.109-27.304). Moreover, participants with high perception about the availability of the sporting facilities at workplace were .2 times more likely to meet PHRs for PA than those with low perceptions ($\div^2 = 7.43$, OR = .17, p = .006, 95% C.I. = .049-.611). Inversely, low perceptions about the involvement of the mass media in promoting regular PA were more likely to meet PHRs for PA than those with high perceptions. On the contrary, we found no effect of the perceptions opportunities provided by the local sporting clubs and participant's residence area and meeting PHRs for PA under physical environment. Besides, there were no effects of the perceptions of the family, friends, health professionals and employers' influence and meeting PHRs for PA with respect to social environmental support.

Table 1: Description of Perceived Physical and Social Environmental Support for PA by the Workers of the Universities

University	UCC	ESUT	p-value
Physical Environment			
The area I live offers many opportunities for engaging in physical activities			.081
Very true	71 (22.3)	88 (27.7)	
Partially true	58 (18.2)	43 (13.5)	
Not true	33 (10.4)	25 (7.9)	
The local sporting clubs in the area I live offer many opportunities for physical activities			.014
Very true	24 (7.5)	42 (13.2)	
Partially true	62 (19.5)	60 (18.9)	
Not true	76 (23.9)	54 (17.0)	
My local authority provides many opportunities for engaging in physical activities			.001
Very true	32 (10.1)	39 (12.3)	
Partially true	36 (11.3)	58 (18.2)	
Not true	94 (29.6)	59 (18.6)	
There are many sporting facilities at my workplace for workers to be physically active			.026
Very true	26 (18.6)	20 (6.3)	
Partially true	55 (17.3)	35 (11.0)	
Not true	81 (25.5)	101 (31.8)	
Social Environment			
My family members encourage me to engage in physical activities always			.255
Very much	65 (20.4)	74 (23.3)	
Not much	75 (23.6)	58 (18.2)	
Not at all	22 (6.9)	24 (7.5)	
My friends encourage me to be physically active always			.054
Very much	83 (26.1)	68 (21.4)	
Not much	66 (20.8)	62 (19.5)	
Not at all	13 (4.1)	26 (8.2)	
Management at my workplace encourage workers to engage in physical activities always			.001
Very much	28 (8.8)	18 (5.7)	
Not much	72 (22.6)	43 (13.5)	
Not at all	62 (19.5)	95 (29.9)	
Mass media (radio, TV) in my area promotes engaging in regular physical activities			.911
Very much	69 (21.7)	63 (19.8)	
Not much	67 (21.1)	68 (21.4)	
Not at all	26 (8.2)	25 (7.9)	
Health professionals in my locality educate people to be physically active always			.002
Very much	72 (22.6)	50 (15.7)	
Not much	45 (14.2)	73 (23.0)	
Not at all	45 (14.2)	33 (10.4)	

Table 2: Bivariate Analysis of Demographic Factors Associated with Meeting PHR for PA.

	Wald	OR	95% CI	p-value
Gender				
Male	3.657	2.43	.978-6.030	.06
Female			1.0	
Age				
≤44	4.092	1.06	1.002-1.125	.04
≥ 45		1.0		
Marital Status				
Single	.078	.88	.381-2.064	.78
Married				
Educational Status				
Master Degree	5.317	5.11	1.277-20.454	.021
Diploma/First Degree	5.852	3.23	1.249-8.355	.016
Certificate	7.734			.021
Health Status				
Very Good	.604			.740
Good	.020	.938	.391-2.251	.887
Satisfactory	.467	1.72	.362-8.191	.494
Physical Environment				
The area I live offers many opportunities for engaging in physical activities				
Not true	4.075			.130
Partially true	2.252	3.08	.709-13.401	.133
Very true	.101	.84	.294-2.415	.751
The local sporting clubs in the area I live offer many opportunities for physical activities				
Not true	1.745			.418
Partially true	1.739	.522	.198-1.372	.187
Very true	.362	.694	.212-2.278	.547
My local authority provides many opportunities for engaging in physical activities				
Not true	2.325			.313
Partially true	.863	1.59	.596-4.264	.353
Very true	1.927	2.46	.690-8.801	.165
There are many sporting facilities at my workplace for workers to be physically active				
Not true	8.218			.016
Partially true	2.112	.471	.171-1.300	.146
Very true	8.207	.218	.077-.618	.004

Social Environment				
My family members encourage me to engage in physical activities always				
Not at all	1.124			.570
Not much	.004	.960	.294-3.140	.947
Very much	.480	1.56	.447-5.441	.486
My friends encourage me to be physically active always				
Not at all	.029			.986
Not much	.008	.943	.250-3.558	.931
Very much	.028	.927	.380-2.259	.868
Management at my workplace encourage workers to engage in physical activities always				
Not at all	.084			.959
Not much	.065	.843	.227-3.125	.798
Very much	.081	.822	.212-3.182	.776
Mass media (radio, TV) in my area promotes engaging in regular physical activities				
Not at all	5.148			.076
Not much	1.317	2.213	.570-8.591	.251
Very much	.485	.664	.209-2.104	.486
Health professionals in my locality educate people to be physically active always				
Not at all	.008			.996
Not much	.000*	1.009	.344-2.957	.987
Very much	.007	1.046	.357-3.064	.934

Table 3: Multivariate Analysis of Perceived Environmental Factors Associated with Meeting PHR for PA.

Variable	Wald	OR	95% C.I.	p-value
Physical Environment				
The area I live offers many opportunities for engaging in physical activities				
Not true	4.492			.106
Partially true	3.186	4.618	.861-24-767	.074
Very true	.000	.996	.290-3.417	.994
The local sporting clubs in the area I live offer many opportunities for physical activities				
Not true	1.725			.422
Partially true	1.707	.460	.144-1.474	.191
Very true	.425	.589	.120-2.892	.514
My local authority provides many opportunities for engaging in physical activities				
Not true	4.440			.109
Partially true	.660	1.596	.577-4.930	.416
Very true	4.353	5.503	1.109-27.304	.037
There are many sporting facilities at my workplace for workers to be physically active				
Not true	7.628			.022
Partially true	2.980	.365	116-1.146	.084
Very true	7.427	.173	.049-.611	.006
Social Environment				
My family members encourage me to engage in physical activities always				
Not at all	1.105			.576
Not much	.136	1.312	.311-5.541	.712
Very much	.894	2.173	.435-10.862	.344
My friends encourage me to be physically active always				
Not at all	.124			.940
Not much	.045	.844	.76-4.058	.833
Very much	.000	1.015	.187-5.577	.987
Management at my workplace encourage workers to engage in physical activities always				
Not at all	.171			.918
Not much	.169	1.159	.419-3.780	.681
Very much	.011	1.090	.224-5.312	.915
Mass media (radio, TV) in my area promotes engaging in regular physical activities				
Not at all	7.086			.029
Not much	1.212	2.374	.509-11.063	.271
Very much	1.065	.479	.118-1.939	.302
Health professionals in my locality educate people to be physically active always				
Not at all	.278			.870
Not much	.015	.923	.257-3.319	.903
Very much	.120	1.268	.331-4.860	.729

DISCUSSION

The purposes of this study were to (1) determine the PA level of the administrative staff of UCC, Ghana and ESUT, Nigeria (2) explore environmental support factors perceived to be associated with meeting the current PHRs for PA and the role of subjective health status in this association. We found that only 7.5% of the administrative staff (UCC = 4.7%, ESUT = 2.8%) met the current PHRs for PA. Bivariate analyses also revealed that only perceptions about availability of sporting facilities at workplace determined meeting PHRs for PA with a very small Odd's ratio (.22). In addition, multivariate analyses indicated that perceptions of local authorities providing opportunities, availability of sporting facilities at workplace and mass media promoting regular PA were significant determinants of meeting PHRs for PA. Additionally, self-reported health status had not association of meeting PHRs for PA.

Today's office work environment has always expose workers to sedentary lifestyle (Prodaniuk, et al., 2004). It is not therefore too surprising that only 7.5% of the administrative staff with UCC staff relatively (4.7%) meeting the PHRs for PA than ESUT (2.8%). This difference in meeting PHRs for PA is perhaps explained by the age and gender differences among the workers of the two universities (see Table 1). Recently, Vaughan et al. (2008) found that very few adults engage in moderate-to-vigorous intensity PA to achieve health benefits. Their study moreover, involved predominantly women, with over one-third being age 45 or above. Likewise, in our study, of 49.7% ESUT participants, 27.0% were females 21.7% males. Hence, it is not too surprising the evidence of low level of PA engagement among the workers especially those of ESUT workers.

Bivariate analyses also revealed that only perceptions about availability of sporting facilities at workplace determined meeting PHRs for PA with a very small Odd's ratio (.22). No association was found between perception of social environment and meeting the current PHRs for PA. However, multivariate analyses indicated that perceptions of local authorities providing opportunities, availability of sporting facilities at workplace and mass media promoting regular PA were determinants of meeting PHRs for PA. On the contrary, perceptions of local sporting clubs, area of residence providing opportunities for PA, influences of family, friends, health professionals and employers were not determinants of meeting PHRs for PA.

As evidence in the current study, Sallis, et al. (2009a) observed that adult workers' perceptions about walkability of their neighborhood correlated highly with achieving a moderate to vigorous PA attaining health enhancing threshold (WHO, 2005). For

instance, access to low-cost sports facilities, availability and convenience of facilities for walking (Sallis, et al., 2009b; Owen, Humpel, Leslie, Bauman, & Sallis, 2004; Wendel-Vos, Droomers, Kremers, Brug, & Van Lenthe, 2007), perceptions of high support from significant others at workplace or community (Bamana, et al., 2008) were significantly associated with meeting PA.

Contrary to other findings (Pan, et al., 2009; Payn, et al., 2008), subjective reported health status had no association with meeting PHRs for PA among university administrative staff. This could be because Payn and colleagues used Behavioural Risk Factor Surveillance Survey (BRFSS) Leisure Time PA (LTPA) that considered only leisure time PA (Centers for Disease Control and Prevention, 2006) as compared IPAQ short form which measures many other domains of PA (Bauman, et al., 2009; WHO, 2005). The workers may also under report their health status to serve their employment and social interest.

It is clear in the current study that only the perception of accessibility to sports facilities at workplace could single determine university administrative workers' rate of meeting PHRs for PA (Owen, et al., 2004; Wendel-Vos, et al., 2007). However, multivariate analyses suggested that perceptions of many environmental support variables such as availability of sports facilities at workplace, local sporting clubs and the media were associated with health beneficial PA participation among the workers (Griew, et al., 2013; Sallis, et al., 2009ab; Sallis, et al., 2006; WHO, 2005). It is also worth noting that but for mass media variable, perceptions of social environmental support was not a determinant of meeting PHRs for PA among the workers as also observed by Pan, et al. (2009).

Implications for Social Entrepreneurship

It is evidenced in this study that promoting health beneficial PA participation among university administrative staff calls for multi-sectorial interventions that target multiple factors rather than a single one. Since workers spend almost equal time both at their area of residence and workplace, there is the need for these interventions to be provided at both settings (Lemon, et al., 2009). This invites pragmatic social entrepreneurial interventions.

Social entrepreneurs are entrepreneurs pursuing social missions such as health, including PA, safety, environmental protective with community involvement. Social entrepreneurs can be individuals, group of individuals or organisations that mainly substitute profits for advancement of social causes (Roger, & Osberg, 2007; Weerawardena, & Mort, 2006). Therefore, it becomes important for the employers of university administrative staff to effectively

collaborate with such few known social entrepreneurs to put their interventions into the promotion of regular PA among this group of work force.

This collaborative health promotion effort should create opportunities for entrepreneurs into opening new fitness centers in and around the universities for the benefit of these workers (Yancey, et al., 2004). Nevertheless, formation of local fitness clubs with regular exercise activities have the tendency to encourage high PA participation especially among the social class where majority of the university administrative staff found themselves. With the proliferation of radio stations and community media centers in and around university and communities, social entrepreneurs can use the media houses to educate the workers and their families about the essence of PA and ways to encourage one another, thus cause behaviour change and improve quality of life (Health Promotion and Chronic Disease Section, 2012). The collaborative efforts should lead to the provision of sporting facilities in the universities by the social enterprises (Yancey, et al., 2004).

It is worthy to note that social entrepreneurs advocate for human improvement policies, in this case policies to increase access to PA facilities in the communities. Social entrepreneurs should be able to advocate through government, municipalities and other relevant agencies to provide communities leisure-time recreational centers such as parks, bicycle and pedestrian walk ways. A strong advocate for security is equally very important if people have to feel safe and take part in PA at any time (Roger, & Osberg, 2007). Thus, social entrepreneurship cannot be ruled out if participation in PA to the point of meeting PHRs is to be achieved and that chronic health burdens are to be minimized in all populations especially among workers whose jobs are sedentary in nature (Chau, van der Ploeg, Merom, Chey, & Bauman, 2012; Radas, et al., 2013).

CONCLUSIONS

This study demonstrated that very few administrative staff of UCC, Ghana and ESUT, Nigeria, are meeting PHRs for PA. Thus, over 92% of the staff are physical inactive for health benefits. Moreover, in line with other authors, our study confirmed that providing only sporting facilities at workplace is likely to increase PA engagement among administrative staff. More importantly, this study demonstrated that rather than a single factor, multiple factors contribute to the participation in PA to the point of meeting PHRs among the university administrative staff and demonstrate that both physical and social environment are important to promoting PA participation. And that, among the university

administration staff, PA participation is not determined by their health status, since most of the rated their health to be good or very good.

The authorities of UCC and ESUT are urgently challenged to institute workplace health promotion programmes with PA participation a core component. The university administrations, their health and sports directorates can liaise with other social enterprise agencies to draw up comprehensive PA programmes that educate both the workers and their families. Such collaborative effort should aim at providing modern PA facilities both at the worksite and at the communities for workers use.

Declaration: The authors declare that they have no conflict of interest.

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