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The relationship between leisure-time physical activity and health parameters in executive employees of selected African countries

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Abstract

Leisure-time physical inactivity is a global public health concern affecting all people in different walks of life, including employees. This inactivity is associated with chronic diseases of lifestyle as well as low work capacity. The purpose of this study were twofold: to determine leisure-time physical activity- (LTPA), coronary risk-, health- and lifestyle profiles of some executive employees in selected African countries; and to determine the relationship between leisure-time physical activity and health related parameters in executive employees of selected African countries. A cross-sectional study design was used on a group of 156 (mean age 41.22±10.17 years) available executive employees. Participants were grouped according to age (<35 years; 36–46 years and > 46 years). Standardised questionnaires were used to collect data. Out of the156 participants in the study, 42.9% occupied top level management and 57.1% middle level management posts. When data were analysed according to age groups, 31% and 68.6% in the less than 35 years age group were in the top and the middle levels management respectively. In the age group 36 to 46 years of age 47% occupied the top level management posts and 52.8% occupied the middle level management positions. With regard to LTPA, top level managers (71.6%) scored low LTPA compared to middle level managers (62.9%). Top level managers scored higher percentages (14.9%) for developing the risk of coronary heart diseases. The results show a negative relationship between physical activity and selected health parameters, with significant negative relationships between low LTPA and daily habitual index ($r = -0.52$; $p=0.01$), and moderate LTPA and daily habitual index ($r = -0.71$; $p<0.001$) for middle level managers. It can be concluded that both top and middle level managers exhibited low LTPA and high risk for developing coronary heart disease. It was apparent that the managers in with low LTPA are prone to bad stages of life style, health status and coronary risk- indexes compared to the ones with moderate and high LTPA. Additionally, low and moderate LTPA inversely affected selected health parameters of executive employees. No significant association was found for high LTPA with selected health parameters. The study therefore recommends a strategic intervention programme geared towards improving the present state of affairs among the managers in the corporate environment.

Keywords: Leisure-time physical activity, physical activity, health and wellness, coronary heart disease, executive employees.

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Introduction

Several researchers have revealed a global increase in mortality rates attributable to chronic diseases, viz: coronary artery disease, diabetes and hypertension (Murry & Lopez, 1997; Bradshaw, Groenewald, Laubscher, Nannan, Nojilana, Norman, Pieterse, Schneider, Timæus, Dorrington & Johnson, 2003). However, this burden may be prevented, in part, by addressing certain lifestyle risk factors, including healthy dietary practices, regular physical activity and refraining from smoking (Mills, 2005).

Physical activity is widely recognised as a key health behaviour, associated with reduced all-cause of morbidity and mortality, as well as chronic diseases of lifestyle (Lambert & Kolbe-Alexander, 2006). Substantial research demonstrating the significant positive association of exercise and health, encouraged the Centre for Disease Control (CDC) to publish recommendations that people should accumulate 30 minutes of exercise most days of the week (Pate, Pratt & Blair, 1995). It has been revealed that the associated health benefits of physical activity accrue in a dose-dependent manner, and early adaptations in the transition from sedentary living to becoming moderately active, seem to have the greatest effect on risk reduction for chronic diseases of lifestyle in both men and women (Bouchard, 2001; Haskell, 2001). Generally, the health benefits of physical activity increases with increasing frequency, duration and intensity of exercise (Bouchard & Katzmarzyk, 2010).

Regardless of recommendations, physical inactivity still remains a major public health concern. In companies, executive employees' lifestyles are more unbalanced due to factors such as long commutes, long working hours, skipping of meals and dining with colleagues, than employees in other ranks (Kawada & Suzuki, 2008). As such, the unbalanced lifestyle is found to be associated with physical and psychological stress that may impact negatively on health and performance at work. Furthermore, these lifestyles put executive employees at risk for developing chronic diseases of lifestyle (Bradshaw, 1997). Coopoo (2006) alluded that the chronic health problems in industries/companies are directly related to risk factors, such as high cholesterol level, poor eating habits, physical inactivity, smoking and alcohol abuse; which are associated with chronic diseases of lifestyle, like diabetes, coronary heart disease, hypertension, stroke and obesity. Researchers (Burton, Conti, Chen & Edington, 1999; Burton, Conti, Chen, Schultz & Edington, 2001; Bunn, Pikelny, Paralkar, Slavin, Borden & Allen, 2005) have also linked poor health status with higher direct health care costs, lower work output (e.g. presenteeism), higher rates of disability, higher absenteeism, higher workers' compensation and higher rates of injury in the company. Yet, whilst these associations are well documented, the effect of leisure-time physical activity and some health parameters in executive employees in selected African countries remain unclear and often anecdotal.

Given this, and the established links between physical activity and productivity at workplace (Schultz & Edington, 2007), more research in this area, especially in Africa is therefore of paramount importance. The purpose of this study was twofold: to determine leisure-time physical activity (LTPA) - coronary risk-, health-, and lifestyle status of some executive employees in selected African countries; as well as the relationship between leisure-time physical activity and health related parameters in these cohorts.

Methodology

Research design

The study was based on cross-sectional design on an available population from selected African countries. This study used the protocol of the South African National Games and Leisure Activities (SANGALA) (Dreyer & Strydom, 1994) which was initiated by the National Government, Department of Sport and Recreation of South Africa in 1995. The initiative was supported by the Heart Foundation of South Africa, International Institute for Health Promotion as well as the African Association for Health, Physical Education, Recreation and Dance (AFAHPER-SD). After the SANGALA study was completed in South Africa, it was expanded to involve more African countries in 2002 to 2006.

Participants

A total number of 156 participants were purposively recruited from the available population to participate in the study. The participants comprised of the middle and top level employees with age ranging from 35 years and above (mean age: 41.2±10.1 years). Participants were recruited from the following African countries namely: Botswana, Kenya and Nigeria. Nigeria is located on the Western part of Africa while Botswana represents Central Africa and Kenya the East of Africa. Nigeria further represents the most populous Black Country in Africa; Botswana represents an emerging democracy and economy while Kenya represents a success story in sport. These features are bound to influence the lifestyles of the citizens of these countries.

Measuring Instruments

The ***physical activity questionnaire of Sharkey*** (1997) was used to determine the leisure-time physical activity index (LTPAI) of the participants. The training principles namely frequency, duration and intensity were reported by each respondent retrospectively and these were used to determine the LTPAI. Respondents were then classified into low active (LTPAI $\leq$ 16), moderate active (LTPAI 17- 44) and high active group (LTPAI $\geq$ 45) (Swanepoel, 2001).

The ***lifestyle questionnaire of Belloc and Breslow*** (1972) was used to determine the lifestyle index (LSI) of the respondents. This questionnaire is based on the 7 basic healthy lifestyles as described by Belloc and Breslow (1972). The

respondents indicated which of the following lifestyles they were following namely, not smoking, moderate physical activity 2-3 times per week, moderate or no alcohol intake, 7-8 hours' sleep per night, manage a moderate body weight, eat breakfast daily and taking 3 meals per day. For the purpose of this study the respondents were classified as those following a poor lifestyle (<3), moderate (4-5) and good lifestyle (>6) (Kriel, 2004).

The ***health status*** index (HSI) of the participants was determined by using the illness rating scale of Wyler, Masuda and Holmes (1968). This scale inquires about the various illnesses the participant contracted in the past 12 months. The scale utilises a list of 126 illnesses which are noted according to the seriousness of the illness, range from the least dangerous (e.g. dandruff=1) to the most serious and life threatening condition (e.g. leukemia=126). Respondents presenting a value of ≥295 were classified as having poor health status, while those showing an index of 135-295 and ≤134 were classified as having moderate and good health respectively (Boshoff, 2000).

The coronary risk index (CRI) questionnaire of Bjürstrom and Alexiou (1978) was used to determine the risk of the participants to develop coronary heart disease. This questionnaire contains statements on 14 risk factors which carry a certain weight depending on the presence or severity of the risk factor. For instance non-smoking is weighted 0 while smoking more than 30 cigarettes per week is weighted 10. The weight of the 14 risk factors are calculated and express a coronary risk index (CRI). A total CRI of ≤21 is described as a low risk, while indices of 22-30 and ≥ 31 were described as moderate and high risk respectively.

Procedures

The African Association for Health, Physical Education, Recreation, Sport and Dance (AFAHPER-SD) infrastructure was used to distribute the questionnaires in each of the selected countries. After negotiating with the President of AAHPERD-SD, contact persons were identified in the selected countries and the questionnaires were posted to them. Follow-up letters were sent to the contacts in order to motivate them for the purpose of data collection. They received detailed instructions on administration and data handling.

Statistical analysis

The SPSS version 18.0 (SPSS, Inc., Chicago) was used for data analysis. Descriptive statistics (i.e. frequencies for percentages (%)) were used to determine the leisure-time physical activity index, CRI, LSI and health profiles of the participants. Frequencies and percentages were used to determine the profile, and correlations coefficients were calculated to determine the relationship between the participants' leisure-time physical activity- (LTPA), coronary risk-, health status- and lifestyle indexes. Statistical significant levels were set at $p \leq 0.05$.

Results

The results show that out of 156 executive employees, 43% are in top management whilst 57% were in middle management level. When data was analysed according to age groups, 31% and 68.6% in the less than 35 years age group were in the top and the middle levels management respectively. In the age group 36 to 46 years of age, 47% occupied the top level of management while 52.8% occupied the middle level management. For the age group older than 46, the percentage was 50% each for both top and middle levels of management.

Figure 1 represents age differences of top and middle management levels. There were 31.4% and 68.6% of top and middle management levels respectively who were aged below 35 years. Another 47.2% and 52.8% of top and middle management levels were between ages 36 and 45. The 46 years and above were 50% top and 50% middle management levels.

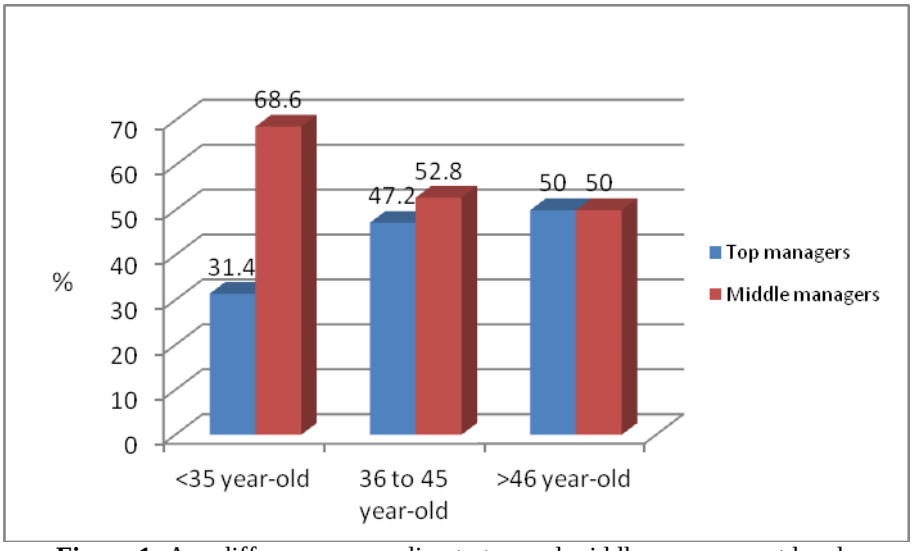

Figure 1: Age differences according to top and middle management levels

Table 1 presents LTPA profile for top and middle executive management levels by age categories.

Table 1: Leisure-time physical activity profile of the top and middle management level employees in selected African countries

Physical Activity Profile	Top Management level		Middle Management level	
	n	%	n	%
Low activity (Physical activity index= < 16)	48	71.6	56	62.9
Moderately active (Physical activity index between 17-44)	17	25.4	24	27.0
Highly active (Physical activity index >45)	2	3.0	9	10.1
Total	**67**	**100.0**	**89**	**100.0**

The results show that executive employees in the top management level (71.6%) and middle management level (62.9%) fell in the low physical activity category. The results also showed that the moderately active category of 25.4% and 27.0% for the top and middle management employees respectively. There were only 3% of top management level and 10.1% of middle management level who were highly active.

In Table 2, the results show that 35.8% of the executive employees in the top management positions can be classified as having a moderate risk for developing CHD while 14.9% are in the high risk for developing CHD. The results also show that 12.4% of middle management level was at high risk for developing CHD, while 34.8% and 52.8% were in moderate and low risk respectively.

Table 2: Coronary risk index for the top and middle management levels of employees in selected African countries

Coronary risk index	Top Management level		Middle Management level	
	n	%	n	%
Low risk for developing CRI (Index=<21 index)	32	47.8	47	52.8
Moderate risk for developing CRI (Index=22 to 30 index)	24	35.8	31	34.8
High risk for developing CRI (Index=>31 index)	10	14.9	11	12.4
Total	**67**	**100.0**	**89**	**100.0**

Table 3 shows that 56.7% employees in the top management level were in good health status, while 26.9% and 16.4% were in moderate and poor health status respectively. It is also shown that 49.4% and 39.3% of middle management level employees were in good and moderate health status respectively. The 2.2% of middle management level were in poor health status.

Table 3: Health status index for the top and middle management level s of employees in selected African countries

Health status index	Top Management level		Middle Management level	
	n	%	n	%
Good and healthy (Index=<134 scores)	38	56.7	44	49.4
Moderately healthy (Index=135 to 294 scores)	18	26.9	35	39.3
Poor health (Unhealthy) (Index=>295 scores)	11	16.4	8	9.0
Missing	-	-	2	2.2
Total	**67**	**100.0**	**89**	**100.0**

In Table 4, 29.9% employees in the middle management level reported a bad lifestyle, while 25.8% showed a fair lifestyle, with 44.9% showing a good lifestyle. There were 40.3% of top management employees who reported a good

lifestyle, while 32.8% and 26.9% in middle management level reported a fair and bad lifestyle respectively.

Table 4: Lifestyle index for the top and middle management levels of employees in selected African countries

Lifestyle index	Top Management level		Middle Management level	
	n	**%**	**n**	**%**
Bad	18	26.9	26	29.2
Fair	22	32.8	23	25.8
Good	27	40.3	40	44.9
Total	**67**	**100.0**	**89**	**100.0**

In Table 5, the results show that top level employees who were highly physically active reported a bad and fair lifestyle index respectively, while 55.5% in middle management level who were highly active showed a good lifestyle index. There were 46.4% and 37.5% of middle management employee who were low and moderate physically active had a good lifestyle index compared to the 41.7% and 41.1% of the top management level employees respectively.

Table 5: Lifestyle index in relationship with the physical activity of employees in selected African countries

	Top level Management						**Middle level Management**					
	Low LTPAI		**Moderate LTPAI**		**High LTPAI**		**Low LTPAI**		**Moderate LTPAI**		**High LTPAI**	
Lifestyle index	n	%	n	%	n	%	n	%	n	%	n	%
Bad	12	25	5	29.4	1	50.0	16	28.6	7	29.2	3	33.3
Fair	16	33.3	5	29.4	1	50.0	14	25.0	8	33.3	1	11.1
Good	20	41.7	7	41.1	-	-	26	46.4	9	37.5	5	55.5
Total	**48**	**100.0**	**17**	**100.0**	**2**	**100.0**	**56**	**100.0**	**24**	**100.0**	**9**	100.0

Table 6 shows 50% of top management level who reported a low physical activity index had a low risk for developing CHD, while 33.3% and 14.6% were at moderate and high risk respectively. The results also show that 41.2% of top management level employees who reported moderate physical activity were at a moderate risk for developing CHD, while the other 41.2% and 17.6% were at moderate and high risk respectively. With the highly active category, the results revealed that 50% were at low risk for developing CHD, while the other 50% were at a moderate risk for developing CHD. The results show that 53.6% of the employees who reported a low physical activity level were in low risk for developing CHD, while 30.4% and 16.1% were in moderate and high risk for developing CHD respectively. The 37.5% who reported moderate physical activity in middle management employees were at a low risk for developing CHD as compared to 54.2% and 8.3% who were at a moderate and high risk for developing CHD. The middle management employees who reported high

activity levels were 88.9% and 11.1% who reported a low and moderate risk for developing CHD respectively.

Table 6: Coronary heart disease risk in relationship with the physical activity index of employees in selected African countries

Coronary heart disease risk	Top Management level						Middle Management level					
	Low LTPAI		Moderate LTPAI		High LTPAI		Low LTPAI		Moderate LTPAI		High LTPAI	
	n	%	n	%	n	%	N	%	n	%	n	%
Risk of developing CHD(Low CRI) (Index=-<21)	24	50.0	7	41.2	1	50.0	30	53.6	9	37.5	8	88.9
Risk of developing CHD(Moderate) (Index= 22 to 30)	16	33.3	7	41.2	1	50.0	17	30.4	13	54.2	1	11.1
High Risk for developing CHD (Index=>31)	7	14.6	3	17.6	-	-	9	16.1	2	8.3	-	-
Missing	1	2.1	-	-	-	-	-	-	-	-	-	-
Total	**48**	**100.0**	**17**	**100.0**	**2**	**100.0**	**56**	**100.0**	**24**	**100.0**	**9**	**100.0**

Table 7 shows that 62.5% of the top management employees who reported low physical activity showed a good health status, compared to 25% and 12.5% who were in moderate and poor health status respectively. While 41.2% of those who reported a moderate physical activity showed a good health status, compared to 29.4% and 29.4% who were at a moderate and poor health status respectively. There were also 50% who reported high activity levels who were in a good health status and another 50% who were moderately healthy.

Table 7: Health status index in relationship with the physical activity index of executive employees in selected African countries

Health status index	Top level Management						Middle level Management					
	Low LTPAI		Moderate LTPAI		High LTPAI		Low LTPAI		Moderate LTPAI		High LTPAI	
	n	%	N	%	n	%	n	%	n	%	n	%
Good and Healthy (Index < 134)	30	62.5	7	41.2	1	50.0	25	44.6	13	54.2	6	66.7
Moderately Healthy (Index 135 to 294)	12	25.0	5	29.4	1	50.0	25	44.6	7	29.2	3	33.3
Poor Health (Unhealthy) (Index >295)	6	12.5	5	29.4	-	-	4	7.1	4	16.7	-	-
Total	48	100.0	17	100.0	2	100.0	54	96.4	24	100.0	9	100.0

The results also show that 44.6% of the middle management employees who reported a low physical activity had a good health status compared with 44.6% and 7.1% who showed a moderate and poor health status respectively. In the case of middle management employees 16.7%, 29.9% and 54.2% who reported a moderate physical activity level showed a poor, moderate and good health status

respectively. There were 66.7% of the middle management employees who were highly active, reported a good health status, while 33.3% reported a moderate health status.

Tables 8 and 9 present the results on the relationship between selected health parameters and leisure-time physical activity for different age categories of the top and middle managers respectively. The results show that leisure-time physical activity index was negatively correlated with selected health parameters in almost all categories for both top and middle level managers. Significant negative relationships were found between life style and low LTPAI (r=-0.52; p=0.01), and moderate LTPAI (r=-0.71; p<0.001).

Table 8: Leisure-time physical activity index and health parameters of top level managers

	Low LTPAI						**Moderate LTPAI**						**LTHigh PAI**					
Age group	<35 (n= 14)		36 to 45 (n=16)		>46 (n=17)		<35 (n= 1)		36 to 45 (n=16)		>46 (n=9		<35 (n= 14)		36 to 45 (n=1)		>46 (n=1)	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
LSI	-.17	.56	.34	.18	-.20	.43	-	-	-.49	.26	-.17	.67	-	-	-	-	-	-
HSI	-.08	.78	-.08	.76	.28	.28	-	-	.20	.67	.43	.25	-	-	-	-	-	-
CRI	-.18	.54	.02	.94	-.14	.59	-	-	.51	.24	.24	.53	-	-	-	-	-	-

LSI= life style index; HSI=health status index; CRI= coronary risk index

Table 9: Leisure-time physical activity index and health parameters of middle level managers

	Low LTPAI						**Moderate LTPAI**						**High LTPAI**					
Age group	<35 (n= 24)		36 to 45 (n=15)		>46 (n=17)		<35 (n= 6)		36 to 45 (n=11)		>46 (n=7)		<35 (n= 5)		36 to 45 (n=1)		>46 (n=1)	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
LSI	.07	.69	-.08	.79	-.52*	.03	.16	.76	-.74**	.01	.11	.81	.52	.37	-	-	-	-
HSI	.29	.18	-.26	.34	-.07	.78	-.50	.31	-.23	.49	.09	.84	-.69	.20	-	-	-	-
CRI	-.01	.96	-.20	.48	-.06	.81	-.53	.28	.15	.65	.38	.40	.22	.73	-	-	-	-

LSI= life style index; HSI=health status index; CRI= coronary risk index, *p<0.01; **p<0.001

Discussion

The purpose of this study were twofold: to determine leisure-time physical activity - (LTPA), coronary risk, - health - and lifestyle profiles of some executive employees in selected African countries; and the relationship between leisure-time physical activity and health related parameters in executive employees of selected African countries.The results show that both the top and middle level managers were reported low participation in leisure-time physical activity. The results also show that the top level managers were prone to a high

risk of developing coronary heart disease, together with a poor lifestyle and health status index. Furthermore, the results show that both the top and middle level managers who reported low participation in leisure-time physical activity had bad lifestyle index, poor health status and high risk of developing coronary heart disease compared to those in the moderate and high LTPA. Additionally, LTPA had an inverse effect on selected health parameters of executive employees.

From the results of the study, it appears that the executive employees in selected African countries reported low leisure-time physical activity level, which corresponds with a similar study among employees of a financial institution in South Africa (Labuschagne, Strydom & Wilders, 2007). In a Behavioural Risk Factor Surveillance System among the US adults, it was indicated that 30% of adults were inactive during leisure time (Macera & Pratt, 2000). The present results show that the top level managers were also in a high risk for developing coronary heart disease. As such this is a worrisome concern since it is found that about 200,000 deaths each year were associated with coronary heart disease, colon cancer, type 2 diabetes and physical inactivity (Powell & Blair, 1994). Furthermore, leisure-time spent sitting (≥6 hours per day vs. <3 hours per day) was associated with 34% and 17% increased risk of death among women and men respectively (Patel, Peterson, Dai, Brennan, Redberg, Anderson, Brindis, & Douglas, 2010). Consequently, it is been stated that chronic heart diseases as a result of inactivity may lead to presenteeism that prevent optimal functioning, performance and productivity of employees' at work (Burton, Pransky, Conti, Chen & Edington, 2004).

Both top and middle management level employees with low LTPA portrayed a bad LSI, HSI and increased risk of developing CHD. In a study by Swanepoel (2001) it was found that 77% of South African high level employees do not follow the most basic lifestyle habits (don't smoke, follow moderate physical activity 2 to 3 times per week, moderate alcohol intake, 7 to 8 hour of sleep per night, maintain a moderate body weight, eat breakfast daily and take at least 3 meals per day at regular intervals).

The results show that 41.9% of employees in both top and middle management level who have a low LTPAI achieved a poor HSI. The results concur with the study by Shehu, Abdullahi & Adeyeke, (2010), in which it was revealed that health problems suffered by people are significantly related to physical inactivity. Physical activity has been found to have a potential to improve the health and well- being of employees. This is emphasised in a study by Lahti, Laaksonen, Lahelma and Rahkonen (2010) suggesting that leisure-time physical activity supports good physical health functioning among middle aged employees. A poor health employee compared to an employee in good health is more likely to be absent from work and less productive while on the job

(presenteeism or health- related performance reduction) (Loeppke, Edington & Bég, 2010).

The present study showed a negative correlation between physical activity and selected health parameters (lifestyle-, health status- and coronary heart disease risk), where significant negative relationships were found between daily habits and low LTPA (r = -0, 52; p = 0, 01) and moderate LTPA (r = -0, 71; p< 0,001). This denotes that employees who showed a moderate and low LTPA had bad life style habits. The result concurs with the reports of studies by Paffenbarger, Hyde, Wing, Lee, Jung and Kampert (1993), were increased risk of death was associated with the presence of each of the five adverse personal characteristics -- sedentary living, cigarette smoking, hypertension, overweight for height (a high body-mass index), and early parental death - with adjustments for differences in age and in each of the other four characteristics. Some researchers has established that physical activity level, physical fitness, and other modifiable lifestyle characteristics may influence the risk of chronic disease and premature death (Paffenbarger, Brand, Sholtz & Jung, 1978; Leon, Connett, Jacobs, Rauramaa, 1987). Studies have revealed that intensive multiple interventions such as smoking cessation, blood lipid reduction, weight control, and physical activity significantly decreased rate of progression and, in some cases, led to regression in the severity of atherosclerotic lesions in persons with coronary disease (Gould, Ornish, Kirkeeide, Brown, Stuart, Buchi, Billings, Armstrong, Ports & Scherwitz, 1992; Haskell *et al.*, 1994).

Limitations of the study

The major limitation in this study has been on few selected African countries. Therefore it does not permit generalisation of the results the whole African continent. In addition, the cross-sectional nature of the study might in one way or the other have affected the present results in some health parameters which are found to develop over a period of time as such a follow-up study is required. As a result of these factors, caution is required in the interpretation of the results.

Conclusion

It can be concluded that both top and middle level managers exhibited low LTPA and may be prone to high risk for developing coronary heart disease. It was also clear that the managers in the low LTPA reported poor lifestyle, health status and coronary risk indexes as compared to the ones in moderate and high LTPA. Additionally, low and moderate levels of LTPA inversely affected selected health parameters of executive employees. No significant association was found for high LTPA with selected health parameters. As such, the results recommend a strategic intervention programme geared towards improving the present state of affairs among the executive managers in the corporate environment.

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