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The Combined Effect of Socio Demographical Factors and Physical Exercise Training on Cardiovascular Health of Fresh Students of Babcock University Ilishan-Remo, Ogun State, Nigeria

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Abstract

Lack of physical activities is one of the strongest risk factors for many chronic cardiovascular diseases, including hypertension, diabetes, obesity, osteoporosis, colon cancer, and depression. This was an experimental study that employed both qualitative and quantitative data collection methods that involved pre-exercise medical evaluation and survey. It investigated the effects of two independent variables, which are the correlate of Socio-demographic factors and PE training on cardiovascular diseases among 600 volunteered fresh students at Babcock University. The data were subjected to statistical analysis, and result were presented in tables and figures. The result of the Mean Arterial Pressure (MAP) showed that there was no significant relationship P>0.05 between gender, level of education, vital signs, and anthropometric measurement. Well above average (74.3%) had a normal MAP, and many (21.5%) were between pre-diabetics. The combined result of the Body Mass Index showed many (60.9%) were obese and overweight. Irregular participation in Physical Activities showed a significant relationship (P<0.05) even do some 160(26.7%) had excellent overall physical health, and 173 (28.8%) had good overall physical health. There were significant interactional effects between groups and time for perceived benefits, interpersonal norms, social support, counter heart conditioning, stimulus control, overall time spent on being physically active per week (P<0.05). In conclusion, it is recommended that collegiate should engage in regular physical activity at a level appropriate to their capacities, needs, and interests to maintain optimal cardiovascular health status.

Keywords: *Babcock University, Cardiovascular Health, Fresh students, Ilishan-Remo, Physical Activity/Physical Exercise Training, Socio Demographical Factors.*

Introduction

Inactivity and lack of physical activities physical exercise is one of the strongest risk factors for many chronic diseases and conditions, including cardiovascular disease, [1] hypertension, diabetes, obesity, osteoporosis, colon cancer, and depression [2-3]. It has been found that Training in Physical Activities or engaging in Physical Exercises may significantly reduce other risk factors for atherosclerosis [4-6]. Also, in one of the reports by [2, 5, 7] the health-seeking behaviour of a person who seeks health care who of course is a consumer and may also be a co-producer of his or her health, in following good habits of diet, hygiene and exercise, and complying with medication, creating, or adopting a lifestyle of being active [2].

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World Health Organization (WHO) issued the same statement on the wake of the global pandemic of Covid 19 that physical exercise is necessary during the lockdown as this may reduce other risk factors for atherosclerosis (e.g., blood lipid abnormalities and elevated blood pressure levels) and thereby decrease the risk of macrovascular or atherosclerotic complications of diabetes [8, 9].

Initial studies found increased severity of coronavirus disease 2019 (COVID-19) [10], caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in patients with diabetes mellitus. Furthermore, COVID-19 might also predispose infected individuals to hyperglycaemia. [11] opined that regular physical activity decreases the risk of cardiovascular disease mortality in general [10, 12] and of coronary heart disease mortality in particular, hence it was a piece of open advice to prevent such complications among patients with diabetes mellitus who are at risk of SARS-CoV-2 infection that they should try not to be sedentary for long periods, as regular physical activity is associated with decreased incidence of thromboembolism [13]. Instead, these individuals should try to engage in physical activity to improve blood circulation [10, 14, 15].

College students, generally late adolescents (age of transition between childhood and self-sufficient adulthood), go through many physical and mental changes that may have positive and negative influences on their lives [16, 17]. It is observed that participation in regular physical activity during these transitionary periods assist college students to cope with stress, aiding their transition into self-sufficient adulthood [15].

Approximately one-third of children in Nigeria are overweight or obese. It has been observed by [18] that there is also a trend of low involvement of college students on physical activities, which may lead to obesity [19]. Children (particularly adolescents) need a positive behavioural change on weight control, as obese individuals may also suffer from social stigmatization, discrimination, and lowered self-esteem [10, 15, 20, 21]. Overweight and obesity (including childhood obesity) substantially raise the risk of illness from high blood pressure, high cholesterol [5, 22], type 2 diabetes, heart disease, and stroke, gallbladder disease, arthritis, sleep disturbances, cardiovascular disease [5], hypertension [23], osteoporosis, colon cancer [19] missing before [24], and depression [25] and certain types of cancers.

In research, it was [26] recommended 30 minutes of moderate activity on five (5) or more days per week or twenty minutes (20) [2, 26] of vigorous activity three (3) or more times per week [20, 27]. It has been recommended that an appropriate exercise program, if added to the diet or drug therapy, will improve blood glucose control, and reduce certain cardiovascular risk factors among persons with diabetes [24, 28, 31].

The undergraduates may not have known that they are at risk of such diseases like diabetes, high blood pressure, and arteriosclerosis, arthritic situations, and burden of cardiovascular diseases or invariably placed them at a high risk of total breakdown from these diseases or associated diseases if care (proper) is not taken [19, 29].

Diet and exercise have been found to be most effective for controlling NIDDM in persons who have mild disease and are not taking medications [30, 31]. Hence, this study sought to increase the time spent, intensity, and sustained participation in physical activities/exercises of the adolescents at Babcock University to improve the general wellbeing of the students and militate against cardiovascular diseases.

Materials and Methods

The study Design adopted was a one-arm quasi-experimental testing and control. It was aimed at investigating the effects of two independent variables, which are the correlate of Socio-demographic factors and Physical

Exercise training on cardiovascular diseases among volunteered 600 freshmen of Babcock University. The study employed both qualitative and quantitative data collection methods, an experimental study which involved the collection of vital signs among volunteers and the use of a questionnaire for the study. These were done through a pre-exercise medical evaluation and survey within six weeks among the freshmen of Babcock University Ilishan-Remo, Ogun State.

Results

The result of the post-intervention has been shown in line with the baseline Test and reports. However, Table 1 shows the changes in mean knowledge score and that the outcome variables across pre and post have significant interaction effects between groups. The Knowledge mean score at the base was 19.57± 6.12 and the Knowledge mean score at the post was 21.78± 5.36 on a 27point scale.

Table 1. Comparison of Knowledge means Scores of the Respondents at Baseline and Post Intervention

	Base Line				**Post-intervention**					
	N	Mean	Std. Deviation	Std. Error		N	Mean	Std. Deviation	Std. Error	Pvalue
Knowledge	600	19.5700	6.12843	.25019	**Total**	600	21.7817	5.36333	.21896	.613 .032

Baseline/pre-Intervention Result for Knowledge mean Score (KMS) on Physical Activity Behaviour of the Respondents

Table 1 presents results relating to respondents' knowledge mean score at baseline. Knowledge scores were from a range of 25, and a score below average is rated low, and above the mean is rated high. The knowledge means sscore for the group was 19.37±6.035. The knowledge mean result showed that the level of KMS was above the average, which was high compared on a 27point scale. There was no significant relationship df=2 F=1.566 and P>0.005. It was observed that a very reasonable number of respondents indicated that physical exercise played a great role in enhancing the health of undergraduate students at Babcock University. These show that the freshmen have grasp knowledge of physical exercise to enhance their state of health. Figure 1 below showed that some 126 (21%) of the respondents seldom or never engaged in exercise that increase breathing; some135 (22.5%) had it for less than one time per week; few 105 (17.5%) had it for one to two times per week, some 201(33.5%) had it for three to five times per week while 33 (5.5%) of the respondents had it six times or more per week.

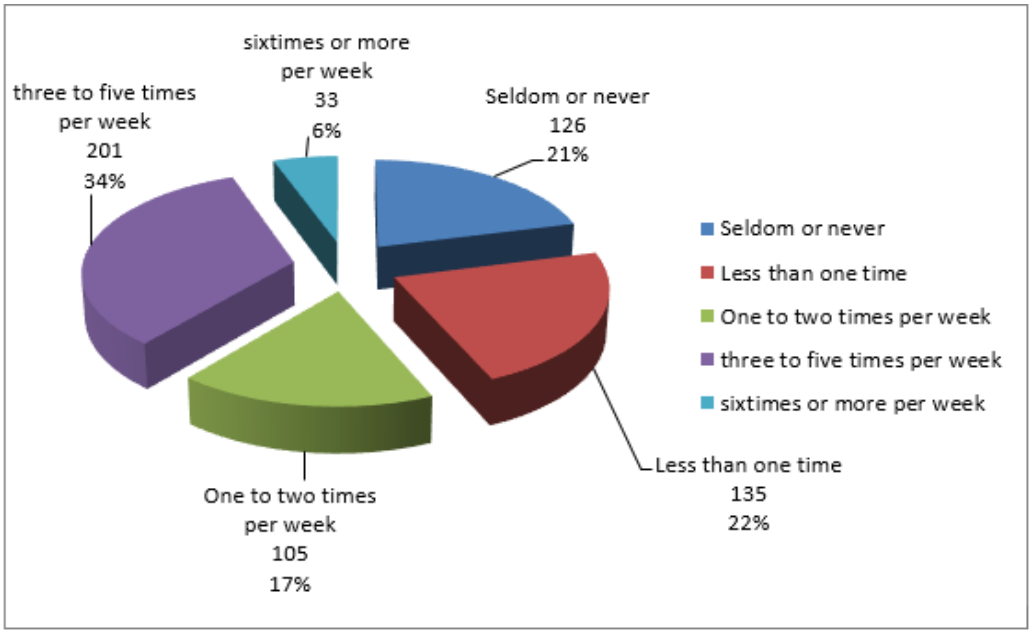

Figure 1. Showing the Details of Respondents Participating in Exercises that Increase Breathing at Baseline

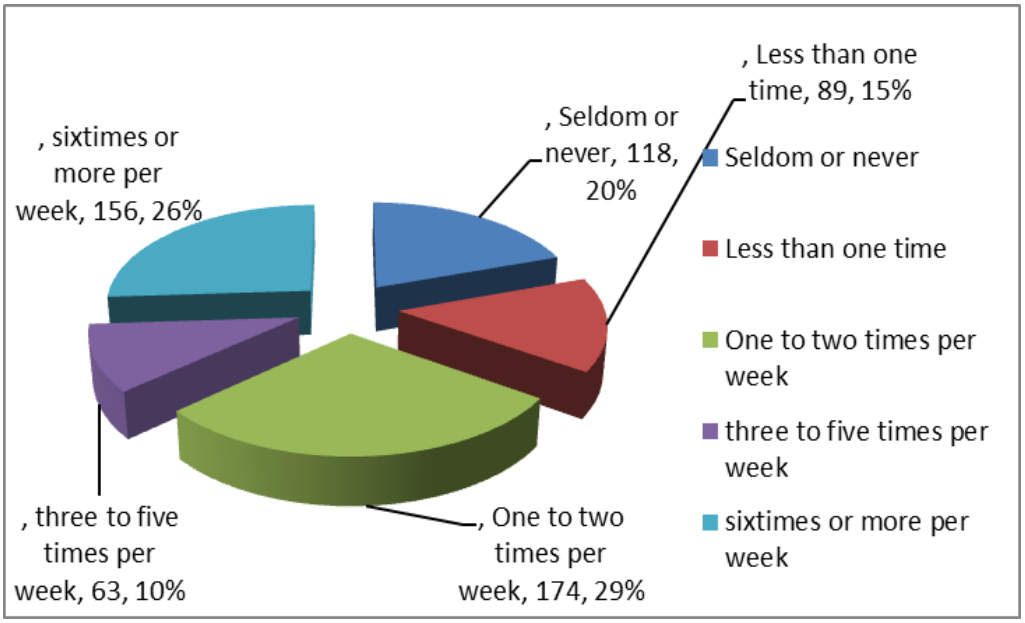

Figure 2. Exercise that Respondents get Involved that Involved Increased Breathing Post Test

The post test showed a significant increase in physical activities and a corresponding decrease in physical inactivity.

The comparison of the baseline and the post-test indicated that there was an increase from 105 (17%) to 174 (29%) among those who exercise one or two times per week. And there was a great change among those who exercised six times a week or more per week from 33(5.5%) to 156(26.0%). The changes in outcome variables across time for the group had a significant interaction effects on time for perceived benefits, social support, counter conditioning, and overall time spent being active per week and PA (mean minutes per day), indicating that the pre and post differed across time. Main effects tests for the group at post-intervention, with the baseline values as a covariate revealed significant differences for counter conditioning, $F = 59.276$, $p = .000$, $R = -282$, the overall minutes on those who can do PA, per week =2.30.

Table 2. Comparison between the Mean Arterial Pressure and the Socio variables

Mean Arterial BP Group		Age of patients	Blood Sugar	Body Temperature	Body Mass Index
Low	Mean	47.5000	98.0000	36.3500	24.3700
	N	2	1	2	2
	Std. Deviation	19.09188	.	.49497	7.09935
	Median	47.5000	98.0000	36.3500	24.3700
	% of Total N	2.8%	2.7%	3.0%	3.0%
Normal	Mean	55.3559	113.7667	36.2463	28.1991
	N	59	30	54	54
	Std. Deviation	15.28439	58.23951	1.01400	8.00475
	Median	55.0000	97.5000	36.5000	26.5450
	% of Total N	81.9%	81.1%	80.6%	81.8%
High	Mean	58.2727	114.3333	36.5091	27.5410
	N	11	6	11	10
	Std. Deviation	9.73746	34.03332	.73410	3.56879
	Median	58.0000	108.0000	36.8000	28.3700
	% Of Total N	15.3%	16.2%	16.4%	15.2%
Total	Mean	55.5833	113.4324	36.2925	27.9833
	N	72	37	67	66
	Std. Deviation	14.57158	53.85193	.95953	7.43343
	Median	55.0000	99.0000	36.5000	26.8150
	% Of Total N	100.0%	100.0%	100.0%	100.0%

From the Table 3 below, the Sig. (2=tailed) for all the variables in relation to the 3 groups of the mean arterial pressure (MAP) (the P-value of the result were classified as low, normal, and high) were greater than 0.05. Hence, there is no significant difference between the variables, that is mean ages, blood sugar level, body temperature, and the body mass index of patients, and the resulting MAP categorized as low, normal, and high. The result showed that the mean arterial pressure did not affect the age, blood sugar level, body temperature, and body mass index of this group of Students P>0.005.

Table 4 showed the cross-examined variables. The result showed the results of all the vital and anthropometric measurements. The body mass index showed that many are obese or are classified as having overweight these group formed about (60.9%) of the cohort, some had prediabetes tendency (32.4%) and the body temperature were normal while the Mean Arterial Pressure (MAP) showed that many (74.3%) from among the cross section of the students that volunteered were within normal range (Value 4.638^{a} df 8, P= .000).

Table 3. ANOVA Table Showing the Mean Arterial Pressure of Students

Variable			Sum of Squares	Df	Mean Square	F	Sig
Age of respondents * Mean Arterial BP Group	Between Groups	(Combined)	213.293	2	106.646	.495	.612
	Within Groups		14862.207	69	215.394		
	Total		15075.500	71			
Blood Sugar * Mean Arterial BP Group	Between Groups	(Combined)	246.381	2	123.191	.040	.961
	Within Groups		104154.700	34	3063.374		
	Total		104401.081	36			
Body Temperature * Mean Arterial BP Group	Between Groups	(Combined)	.638	2	.319	.339	.713
	Within Groups		60.128	64	.940		
	Total		60.766	66			
Body Mass Index * Mean Arterial BP Group	Between Groups	(Combined)	30.582	2	15.291	.271	.764
	Within Groups		3561.054	63	56.525		
	Total		3591.636	65			

(Value 4.638a df 8, P> .005)

Table 4. Showing the Mean Arterial Pressure of Students

S/Nos	Gender	Blood glucose	Temperature	BMI	MAP	BMI group	Blood sugar level	Body temp	Mean Arterial Pressure (MAP)
1	Female	-	-	-	98.33	-	-	-	Normal
2	Female	-	-	41.59	106.67	Obese	-	-	Normal
3	Male	82.00		-	108.33	-	Normal		Normal
4	Female	180.00	37.40	30.09	123.33	Obese	Diabetes	Normal	High
5	Male	-	32.00	17.96	74.00	Underweight	-	Low	Normal
6	Female	-	36.00	29.39	69.33	-	-	Normal	Low
7	Female	-	35.00	42.46	108.00	Obese	-	Low	Normal
8	Female	-	37.00	29.90	96.67	-	-	Normal	Normal
9	Female	-	36.70	26.57	96.67	Overweight	-	Normal	Normal
10	Male	-	36.40	26.52	83.33	Overweight	-	Normal	Normal
11	Male	-	36.50	24.01	105.00	-	-	Normal	Normal
12	Female	-	37.00	26.96	96.67	Overweight	-	Normal	Normal

13	Female	-	36.90	34.70	96.67	Obese	-	Normal	Normal
14	Female	-	32.00	23.53	110.00	Normal	-	Low	Normal
15	Female	88.00	36.20	35.92	93.33	Obese	Normal	Normal	Normal
16	Female	113.00	36.30	25.95	116.67	Overweight	Prediabetes	Normal	High
17	Female	382.00	37.50	24.24	86.67		Diabetes	Normal	Normal
18	Female	95.00	35.00	20.60	80.00	Normal	Normal	Low	Normal
19	Female	43.00	36.50	32.24	103.33	Obese	Normal	Normal	Normal
20	Female	83.00	36.30	24.92	86.67		Normal	Normal	Normal
21	Female	-	35.00	22.94	95.67	Normal	-	Low	Normal
22	Female	-	35.00	28.33	116.67	Overweight	-	Low	High
23	Female	-	37.10	28.35	111.33	Overweight	-	Normal	High
24	Female	-	36.50	30.23	93.67	Obese	-	Normal	Normal
25	Female	-	37.00	25.43	85.33	Overweight	-	Normal	Normal
26	Female	-	36.40	23.23	88.00	Normal	-	Normal	Normal
27	Female	94.00	36.80	30.84	116.67	Obese	Normal	Normal	High
28	Female	-	36.50	23.67	101.67	Normal	-	Normal	Normal
29	Female	-	36.90	30.82	113.33	Obese	-	Normal	High
30	Female	-	35.50	20.24	140.00	Normal	-	Low	High
31	Female	100.00	36.00	26.67	99.00	Overweight	Normal	Normal	Normal
32	Male	107.00	36.00	22.66	123.33	Normal	Prediabetes	Normal	High
33	Female	106.00	36.00	18.98	86.00	Normal	Prediabetes	Normal	Normal
34	Female	-	36.40	28.98	102.67	Overweight	-	Normal	Normal
35	Female	93.00	36.20	40.75	92.67	Obese	Normal	Normal	Normal
36	Female	-	36.80	30.48	109.33	Obese	-	Normal	Normal
37	Female	-	36.00	23.91	80.33	Normal	-	Normal	Normal
38	Male	-	36.50	31.02	103.33	Obese	-	Normal	Normal
39	Female	106.00	36.80	65.00	90.00	Obese	Prediabetes	Normal	Normal
40	Female	93.00	36.00	29.39	93.33	-	Normal	Normal	Normal
41	Female	93.00	36.00	18.81	100.67	Normal	Normal	Normal	Normal
42	Female	95.00	36.70	39.72	106.67	Obese	Normal	Normal	Normal
43	Female	-	37.20	24.56	82.33	-	-	Normal	Normal

44	Female	-	-	24.54	96.00	-	-	-	Normal
345	Female	-	37.00	-	95.00	-	-	Normal	Normal
46	Female	94.00	36.70	36.51	86.67	Obese	Normal	Normal	Normal
47	Female	205.00	35.50	-	90.00	-	Diabetes	Low	Normal
48	Female	113.00	36.00	37.65	86.67	Obese	Prediabetes	Normal	Normal
49	Female	98.00	36.70	19.35	66.00	Normal	Normal	Normal	Low
50	Female	89.00	36.80	32.42	105.00	Obese	Normal	Normal	Normal
51	Female	-	36.80	28.39	106.67	Overweight	-	Normal	Normal
52	Female	120.00	37.00	22.49	76.67	Normal	Prediabetes	Normal	Normal
53	Female	94.00	36.80	23.05	75.33	Normal	Normal	Normal	Normal
54	Female	110.00	37.40	27.06	83.33	Overweight	Prediabetes	Normal	Normal
55	Male	99.00	36.10	-	98.67	-	Normal	Normal	Normal
56	Female	90.00	36.40	19.17	93.33	Normal	Normal	Normal	Normal
57	Female	83.00	36.80	29.74	133.33	-	Normal	Normal	High
58	Female	-	36.70	22.98	82.67	Normal	-	Normal	Normal
59	Female	110.00	35.70	28.13	86.67	Overweight	Prediabetes	Low	Normal
60	Female	122.00	36.70	38.10	76.67	Obese	Prediabetes	Normal	Normal
61	Male	-	35.70	21.88	106.67	Normal	-	Low	Normal
62	Male	-	36.70	20.08	83.33	Normal	-	Normal	Normal
63	Male	-	36.60	23.23	76.67	Normal	-	Normal	Normal
64	Female	118.00	36.50	24.16	87.67	-	Prediabetes	Normal	Normal
65	Female	109.00	37.00	-	111.33	-	Prediabetes	Normal	High
66	Female	-	35.60	29.22	73.33	-	-	Low	Normal
67	Female	185.00	36.40	30.67	86.67	Obese	Diabetes	Normal	Normal
68	Male	109.00	36.10	19.65	79.33	Normal	Prediabetes	Normal	Normal
69	Female	96.00	35.80	27.55	89.67	Overweight	Normal	Low	Normal
70	Female	96.00	37.30	24.77	93.33	-	Normal	Normal	Normal
71	Male	104.00	-	25.16	90.67	Overweight	Prediabetes	-	Normal
72	Female	-	36.80	28.39	126.67	Overweight	-	Normal	High

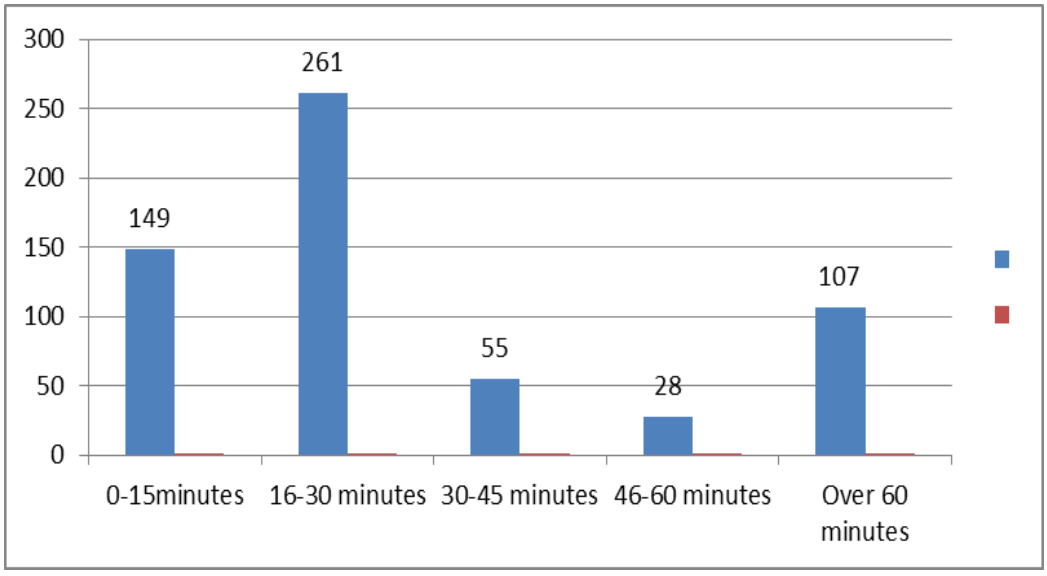

Figure 3. Showing Time Period Spent on Vigorous Activity at the Baseline

Many 56% are not on usual maintenance drugs as shown on table 4 and figure 3, but 27.5% used drug at least ones while 14.6 use drug at least twice or thrice. Seventeen percent (17%) of the respondents were diabetic, while only 60 (10%) were having high blood pressure.

Table 5. Showing Respondents Health Status as Indicator of Futuristic Probability of Susceptibility to any of the Cardiovascular Diseases

			Pre		**Post**	
a	**Do you have diabetes**	Yes	104	17.3	104	17.3
b		No	470	78.3	470	78.3
c		Not sure	26	4.3	26	4.3
d	**Do you have High Blood Pressure**	Yes	60	10.0	60	10.0
e		No	504	84.0	504	84.0
f		Not sure	36	6.0	36	6.0

Discussion

The comparison of the baseline and the post-test were that there was an increase on times of involvement in PE as respondents participate on one to two times per week from 105 (17%) to 174 (29%). Females dropped out of organized physical activity/sport. This was supported by [29], almost fifty percent more than males due to having too much coursework 321(53.5%). There were significant interaction effects between groups and time for perceived benefits, interpersonal norms, [5] social support, counter heart conditioning, stimulus control, overall time spent being active per week as discussed by [31] and [24] also discussed the importance of PA in reducing incidences of obesity and CVD, this corroborated with the result that PA (mean minutes per day), indicating that the groups differed across time. Main effects tests for the group at post-intervention, with the baseline values as a covariate revealed significant differences for counter conditioning, F = 59.276, mean score within group 1.60, df 2, p = .000, R = -282, the overall minutes on that can-do PA per week =2.30.

Conclusion

Based on the outcome of this study, school administrators and policymakers should note the enormous contributions of participating in PE that it played a very significant role in

determining the student's involvement in physical activities and also generated information that can be used to design an appropriate policy framework for implementing effective physical exercise in tertiary institutions and stimulating policy formulation or facilitating necessary curricular review, aimed at promoting young persons' participation in physical activities for the purpose of maintaining good health status this was the same as opined by some researcher [12, 24, 29], and especially for the undergraduate students of Babcock University. It is thus concluded that Socio-demographic factors and physical activity training have a significant effect on cardiovascular diseases and signs that predates cardiovascular diseases.

Therefore, their involvement in physical activities might be linked to a direct and through absolute incorporation into the curriculum of higher learning is essential in encouraging adolescents to be involved in physical activities.

Recommendations

Based on the outcome of the study, the followings are recommended:

1. Since physical inactivity is a major risk factor for CVD, hence moderate levels of regular physical activity confer significant health benefits. All collegiate should engage in regular physical activity at a level appropriate to their capacities, needs, and interests.
2. The university administrators should encourage physical activities by entrenching the Physical Education classes into the curriculum to accommodate leading the young ones to adopt a preventive lifestyle that will reduce the sickness burden in the university where heavy insurance is needed for medical upkeep of the students in their colleges, institutions, and university.
3. That apart from the Health Principal course, there should be the introduction of zero (O) unit of seminar be converted to compulsory participation in physical exercise by all students at all levels and should reflect in the transcript of the students.
4. All curriculum reviewer committees should include a Professional Physical instructor to teach or train students on Physical Education courses.

List of Abbreviations

PA/PE: physical activities/physical exercises.

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Declaration of Interest Statement

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