

## PHYSICAL ACTIVITY MOTIVATION: AN EPIDEMIOLOGICAL SURVEILLANCE FOR COLLEGE STUDENTS IN SIERRA LEONE

SAMUEL JOSEPH BEBELEY\*, HENRY JOE TUCKER, MICHAEL CONTEH

Health Education & Behavioural Science Unit, Department of Biokinetics & Health Education, School of Education, Njala University, Sierra Leone, WEST AFRICA.

\*Email: bsaj2004@hotmail.co.uk

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### ABSTRACT

*Physical inactivity or sedentary behaviour in Sierra Leone is more common amongst college students compared to senior & junior secondary and primary school pupils. Hence the need for physical activity epidemiology as a young scientific discipline geared towards the measurement and surveillance of non-communicable diseases (NCDs). This study aimed at scoring measured, surveillanced and evaluated physical activity motivation: an epidemiological surveillance for college students in Sierra Leone. Weekly Leisure Time Exercise Questionnaire (WLTEQ) was the adopted research instrument. The variables were analyzed using IBM-SPSS v.23 Statistics, with a mean and standard deviation age of 28.5±9.5, response rate of 100% and with sampled participants of N=500, ranged from 19-38 years, using simple random sampling (SRS) method of selection. Significant differences were tested at  $P<0.05$ , with highest scores recorded as follows: under physical activity times by sex and marital, males (257.35) and singles (252.96) scored highest for PA Daily. Also, physical activity hours by sex and marital, females (251.81) and singles (250.66) scored highest for PA 7Hrs. That majority of the students (males and singles), responded more to Daily Physical Activity (DPA), showing appreciable Status Physical Activity (SPA), Fitness Physical Activity (FPA) and Weekdays Physical Activity (WPA). Thereby, indicating Enough Physical Activity (EPA) practiced at the moment due to Vigorous Physical Activity (VPA). It was however, strongly recommended that professionals such as governmental and non-governmental organizations within the discipline of administration, public health education promotion should be leading the collaborative effort in motivating students through mass media to accept and regularly practice physical activity to avoid being prone to non-communicable diseases (NCDs) and to maintain wellness of the mind and of the body for a healthy lifestyle.*

**Keywords:** Health education, physical activity epidemiology, non-communicable disease.

### 1. INTRODUCTION

Public health education plays a pivotal role in informed decision making about matters and or issues that affect the smooth and ease health and wellbeing of individuals, communities and the environment through proper planning, quality implementation, evaluation, monitoring, intervention, advocacy and policy development. Therefore, physical inactivity or sedentary behavioural lifestyle is a key component in the domain of physical activity epidemiological surveillance under the discipline of public health education and nutrition. In Sierra Leone, college students make up a significant portion of the population, and that greater majority are more into sedentary behavioural lifestyle compared to the primary, junior and senior high school pupils of which greater majority are more into physical activity (ranging from low-physical activity, moderate-physical activity and vigorous-physical activity) behavioural lifestyle (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). The epidemiological factors worth looking into under physical activity due to regular practice of sedentary behavioural lifestyle of individuals include but not limited to non-communicable diseases (NCDs) such as obesity, cardiovascular related diseases, type II diabetes, insomnia, morbidity and mortality Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

Professional training for carrier advancement in sport, fitness (speed, agility, power, reaction time etc.), aesthetics and workout for wellness of the mind and body, requires maximum volume of oxygen ( $VO_2$  max) through basic aerobic endurance for individual (pediatrics, adolescents, youths, young and old adults and geriatrics) excellence, which serves as a bench mark in sustainable development of physical activity (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Functional movement screening (FMS) in human from the perspective of public health education and nutrition, helps individuals (especially college students and also pupils) in monitoring, surveillance and evaluation of their body flexibility and or inflexibility to carry out the normal day to day functions or

**Correspondence:** Samuel Joseph Bebeley (Ph.D.), Lecturer, Department of Human Kinetics and Health Education, Njala University, PMB Freetown, Sierra Leone, WEST AFRICA, Tell: +8618321992571, Email: bsaj2004@hotmail.co.uk.

activities without undue fatigue, which also is a key component in the domain of physical activity epidemiological surveillance under the discipline of public health education and nutrition (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

Physical activity epidemiology is being considered as a prime factor in monitoring, surveillance and evaluation of physical inactivity for a sustainable development of physical activity, fitness and wellness education, which requires maximum volume of oxygen ( $VO_2$  max) for vigorous physical activity and efficient calorie utilization for healthy-lifestyle (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Hence, for individuals (pediatrics, adolescents, young and old adults and geriatrics) to take up sustainable physical activity, the focus has to be on the following: advantages and or the benefits derived from physical activity for wellness of the body and of the mind, the decision making for physical activity no matter the circumstance, the motives behind doing physical activity, physical activity behaviour regulation, self-efficacy for physical activity and leisure time spent on physical activity (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

Physical activity being an essential element and a determinant factor (personal, social & environmental) in health extension, health nutrition education and primary health care, if practiced regularly with the required utilization of kilocalorie nutrients and devoid of sedentary behaviour, will greatly help individuals in maintaining physiological, psychological and psychosocial wellness and a healthy lifestyle, thereby decreasing obesity and cardiovascular related diseases, morbidity and mortality i.e. non-communicable diseases (Bebeley, Laggao, & Conteh, 2018; Bebeley, Conteh, & Laggao, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Physical activity favoured by autonomy rather than heteronomy in self-determination for physical activity, wellness and motor fitness skill development, is representing a young scientific discipline as an emergence from physical education (education of and through the physical), which is an educational system that enlighten individuals (pediatrics, adolescents, youths, adults, geriatrics, paraplegics and the aged) about the physique of functional human movements (FHM) and health nutrition education (Bebeley, Conteh, & Gendemeh, 2018; Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

In determining individual motivation for sustainable physical activity, professionals such as clinicians, public health educators, health nutrition educators, physical educators, physical activity epidemiologists, exercise physiologists, kinesiologists and health extension workers, will help motivate through mass communication for informed judgement and awareness raising in: frequency of Physical Activity Practices, (Bebeley, Laggao, & Conteh, 2018) Eating Disorders (Bebeley, Laggao, & Tucker, 2017bi), Non-Usage of Drugs (Bebeley, Wu, & Liu, 2016ciii), Unsafe Sexual Practices (Bebeley, Wu, & Liu, 2016cii), surveillance of Vitals (Bebeley, Laggao, & Tucker, 2017bii), awareness of Cardiovascular Diseases (Bebeley, Laggao, & Tucker, 2017c), and Sport Injuries (Bebeley, Wu, & Liu, 2016ci) surveillance of Health (Bebeley, 2016b,c,d) surveillance of Muscle Weakness (Bebeley, 2016a), surveillance of Physical Education (Bebeley & Laggao, 2011; Bebeley, Laggao, & Tucker, 2017a), surveillance of  $VO_2$  max Consumption (Bebeley, 2015), surveillance of Physical Literacy (Laggao, Bebeley, & Tucker, 2017), surveillance of college students' Physical Activity (Bebeley, Liu, & Wu, 2017d,e; Bebeley, Wu, & Liu, 2017b,c,g,) and surveillance of adolescents Physical Activity (Tucker, Bebeley, & Laggao, 2017a; Tucker, Bebeley, & Conteh, 2017b; Tucker, Bebeley, & Conteh, 2018), which geared towards the control and reduction of non-communicable diseases (NCDs) of obesity, lifestyle-related diseases, type II diabetes, insomnia, morbidity and mortality amongst all societal class (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). This study aimed at scoring measured, surveillanced and evaluated physical activity motivation: an epidemiological surveillance for college students in Sierra Leone, aiming at preventing and or reducing behavioural health risk factors of non-communicable diseases (NCDs) for wellness of the mind and of the body.

## **2. METHODS AND MATERIALS**

### **2.1 Respondents**

The research sampled participants of N=500, with a mean and standard deviation age of  $28.5 \pm 9.5$  with a 100% response rate and with 19-38 years age range, selected using a process of simple random sampling (SRS) method, mainly amongst undergraduates students from two tertiary institutions.

## 2.2 Instrumentation

Weekly Leisure Time Exercise Questionnaire (WLTEQ) was the adopted research instrument, with evidence of reliability supported by reliability analysis test of Cronbach's Alpha Reliability (0.884).

## 2.3 Procedure

The testing and scoring of research participants were done individually on campus following procedural instructions provided for by the research instrument, through census survey entry (CSEntry) and census survey processing CSPro) systems software application installed on tablets, smart phones and computers.

## 2.4 Analysis

An inferential Statistics of Non Parametric Tests using the example of Mann Whitney U Statistical Test of Mean Rank from IBM-SPSSv.23 Statistics were used to compute the data, analyze data and compare the research findings at significant value of  $P < 0.05$ .

## 3. RESULTS

**Table 1: Mann-Whitney U Test – physical activity times (N=500)**

Physical Activity Times		Mean Rank of Mann-Whitney U Statistics Test						
		PA Daily	PA 4-6x Weekly	PA 2-3x Weekly	PA 1x Weekly	PA 1x Monthly	PA <a Month	PA Never
Sex	M(n=392)	257.35	253.06	247.62	248.36	250.79	245.91	250.41
	F(n=108)	225.65	241.20	260.96	258.28	249.44	267.15	250.81
	<b>P(2-tailed)</b>	<b>0.003</b>	<b>0.361</b>	<b>0.289</b>	<b>0.179</b>	<b>0.778</b>	<b>&lt;0.001</b>	<b>0.868</b>
Marital	S(n=431)	252.96	250.67	250.15	250.80	250.04	249.22	249.66
	M(n=69)	235.11	249.46	252.71	248.62	253.37	258.49	255.75
	<b>P(2-tailed)</b>	<b>0.162</b>	<b>0.938</b>	<b>0.864</b>	<b>0.804</b>	<b>0.560</b>	<b>0.073</b>	<b>0.035</b>

Key differences observed in Mann Whitney U Test statistics of physical activity times by sex and marital, males (257.35) and singles (252.96) scored highest for PA Daily. Also, physical activity hours by sex and marital, females (251.81) and singles (250.66) scored highest for PA 7Hrs as in tables 1&2.

**Table 2: Mann-Whitney U Test – physical activity hours (N=500)**

Physical Activity Hours		Mean Rank of Mann-Whitney U Statistics Test					
		PA 0Hr.	PA App. 1/2Hr.	PA App. 1Hr.	PA 2-3 Hrs.	PA 4-6 Hrs.	PA App. 7Hrs.
Sex	M(n=392)	246.33	244.91	247.49	260.60	253.53	250.14
	F(n=108)	265.65	270.78	261.43	213.83	239.50	251.81
	<b>P(2-tailed)</b>	<b>&lt;0.001</b>	<b>0.034</b>	<b>0.297</b>	<b>&lt;0.001</b>	<b>0.012</b>	<b>0.329</b>
Marital	S(n=431)	248.30	251.27	248.35	252.74	251.68	250.66
	M(n=69)	264.24	245.72	263.94	236.48	243.12	249.50
	<b>P(2-tailed)</b>	<b>0.005</b>	<b>0.703</b>	<b>0.329</b>	<b>0.234</b>	<b>0.198</b>	<b>0.571</b>

Another key differences observed in Mann Whitney U Test statistics of physical activity status by sex and marital, males (258.46) and singles (252.40) scored highest for PA Among Best. Also, physical activity fitness by sex and marital, males (258.67) and singles (252.85) scored highest for PA Among Best as in tables 3&4.

**Table 3: Mann-Whitney U Test –physical activity status (N=500)**

Physical Activity Status		Mean Rank of Mann-Whitney U Statistics Test			
		PA Among Best	PA Good	PA Average	PA Below Average
Sex	M(n=392)	258.46	252.03	247.34	244.17
	F(n=108)	221.59	244.96	261.96	273.48
	<b>P(2-tailed)</b>	<b>0.001</b>	<b>0.591</b>	<b>0.243</b>	<b>&lt;0.001</b>
Marital	S(n=431)	252.40	253.87	246.51	249.22
	M(n=69)	238.60	229.46	275.45	258.49
	<b>P(2-tailed)</b>	<b>0.316</b>	<b>0.120</b>	<b>0.053</b>	<b>0.303</b>

**Table 4: Mann-Whitney U Test –Physical Activity Fitness (N=500)**

	Physical Activity Fitness	Mean Rank of Mann-Whitney U Statistics Test			
		PA Very Fit	PA Just Fit	PA Moderately Fit	PA Not Fit
Sex	M(n=392)	258.67	252.54	245.76	245.03
	F(n=108)	220.85	243.09	267.70	270.35
	<b>P(2-tailed)</b>	<b>0.002</b>	<b>0.478</b>	<b>0.061</b>	<b>0.001</b>
Marital	S(n=431)	252.85	250.85	249.32	248.98
	M(n=69)	235.85	248.33	257.84	259.99
	<b>P(2-tailed)</b>	<b>0.241</b>	<b>0.874</b>	<b>0.542</b>	<b>0.206</b>

Another, notable differences observed in Mann Whitney U Test statistics of physical activity limitations by sex and marital, females (259.87) and married (266.31) scored highest for Study Pressure No Time for PA. Also, physical activity weekly by sex and marital, males (260.66) and singles (254.31) scored highest for Week Day PA as in tables 5&6.

**Table 5: Mann-Whitney U Test – Physical Activity Limitations (N=500)**

	Physical Activity Limitations	Mean Rank of Mann-Whitney U Statistics Test				
		Study Pressure	Not Allowed Physically	Not Allowed Parent	Not Allowed Health	Lacks Equipment
Sex	M(n=392)	247.92	251.02	250.00	245.26	250.64
	F(n=108)	259.87	248.63	252.31	269.54	250.00
	<b>P(2-tailed)</b>	<b>0.376</b>	<b>0.581</b>	<b>0.057</b>	<b>0.001</b>	<b>0.600</b>
Marital	S(n=431)	247.97	250.96	250.58	248.74	250.58
	M(n=69)	266.31	247.62	250.00	261.49	250.00
	<b>P(2-tailed)</b>	<b>0.255</b>	<b>0.518</b>	<b>0.689</b>	<b>0.129</b>	<b>0.689</b>

**Table 6: Mann-Whitney U Test – Physical Activity Weekly (N=500)**

	Physical Activity Weekly	Mean Rank of Mann-Whitney U Statistics Test	
		Week End Physical Activity	Week Day Physical Activity
Sex	M(n=392)	245.95	260.66
	F(n=108)	267.01	213.61
	<b>P(2-tailed)</b>	<b>0.123</b>	<b>0.002</b>
Marital	S(n=431)	248.55	254.31
	M(n=69)	262.70	226.70
	<b>P(2-tailed)</b>	<b>0.385</b>	<b>0.126</b>

Again, significant differences observed in Mann Whitney U Test statistics of physical activity stands by sex and marital, males (257.63) and singles (254.95) scored highest for Enough PA. Also, physical activity rate by sex and marital, males (263.37) and singles (254.29) scored highest for Vigorous PA as in tables 7&8.

**Table 7: Mann-Whitney U Test – Physical Activity Stands (N=500)**

	Physical Activity Stands	Mean Rank of Mann-Whitney U Statistics Test	
		Enough Physical Activity	Not Enough Physical Activity
Sex	M(n=392)	257.63	243.37
	F(n=108)	224.63	276.37
	<b>P(2-tailed)</b>	<b>0.012</b>	<b>0.012</b>
Marital	S(n=431)	254.95	246.05
	M(n=69)	222.72	278.28
	<b>P(2-tailed)</b>	<b>0.040</b>	<b>0.040</b>

**Table 8: Mann-Whitney U Test – Physical Activity Rates (N=500)**

	Physical Activity Rates	Mean Rank of Mann-Whitney U Statistics Test	
		Moderate Physical Activity	Vigorous Physical Activity
Sex	M(n=392)	241.78	263.37
	F(n=108)	282.14	203.78
	<b>P(2-tailed)</b>	<b>0.006</b>	<b>&lt;0.001</b>
Marital	S(n=431)	247.47	254.29
	M(n=69)	269.42	226.83
	<b>P(2-tailed)</b>	<b>0.214</b>	<b>0.061</b>

#### 4. DISCUSSION

Physical activity (PA) motivation: an epidemiological surveillance for college students in Sierra Leone, is that wing of public health education and nutrition modelling designed to measure, surveillance and evaluate physical inactivity or sedentary behavioural practices of individuals and communities for sustainable development of lifetime physical activity amongst college students in the Republic of Sierra Leone. However, Physical Activity under PA Times: college students' physical activity shows that, more males and singles do daily physical activity (DPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of physical inactivity amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

Physical activity under PA Hours: college students' physical activity shows that, more females and singles do longer physical activity hours (LPAH) compared to their male and couple counterparts. Hence, the need for measurement and surveillance of hours spent on physical activity amongst college males and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Physical activity under PA Status: college students' physical activity shows that, more males and singles considered themselves to be among the best for status physical activity (SPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of physical activity status amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Physical activity under PA Fitness: college students' physical activity shows that, more males and singles considered themselves to be very fit for fitness physical activity (FPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of physical activity hours amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

In the area of physical activity under PA Limitations: college students' physical activity shows that, more females and couples have physical activity limitations (PAL) due to study pressure, compared to their male and single counterparts. Hence, the need for measurement and surveillance of physical activity limitations amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Physical activity under PA Weekly: college students' physical activity shows that, more males and singles do weekdays physical activity (WPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of weekday physical activity amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

Physical activity under PA Stands: college students' physical activity shows that, more males and singles have enough physical activity (EPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of physical activity stands amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018). Physical activity under PA Rates: college students' physical activity shows that, more males and singles do vigorous physical activity (VPA) compared to their female and couple counterparts. Hence, the need for measurement and surveillance of vigorous physical activity amongst college females and couples i.e. physical activity epidemiological surveillance so as to maintain physical wellness and soundness of the mind and of the body (Bebeley, Laggao, & Conteh, 2018; Bebeley, Laggao, & Gendemeh, 2018; Bebeley, Wu, & Liu, 2018).

#### 5. CONCLUSION

That majority of the students (males and singles), responded more to Daily Physical Activity (DPA), showing appreciable Status Physical Activity (SPA), appreciable Fitness Physical Activity (FPA) and appreciable Weekdays Physical Activity (WPA). Thereby, indicating Enough Physical Activity (EPA) practiced at the moment due to Vigorous Physical Activity (VPA), compared to Physical Activity Limitations (PAL) and Longer Physical Activity Hours (LPAH) practiced by their female and couple

counterparts. Hence, exemplifying the relevance of Motivational Drive (MD) for Health Education Promotion (HEP) and Physical Activity Epidemiology Surveillance (PAES), that is Self-Determined and transtheoretically molded to aid avoidance and minimization of Non-Communicable Diseases (NCDs) amongst college students in Sierra Leone.

Strongly recommended was that, professionals including health systems administrators, clinicians, physical activity epidemiologists, exercise physiologists, kinesiologists, health extension workers, physiotherapists, health economists, health education nutritionists, public health and health education promoters in the preventive health care drive, should take a responsible lead in making informed decisions to college students, school community members, family community members, church community members, mosque community members, market community members, slum community members etc., about the relevance of autonomously rather than heteronomously taking part in sustainable lifetime physical activity (SLPA) using a young emergence scientific discipline called physical activity epidemiology, that caters for the prevention and minimization of none communicable diseases (NCDs) such as obesity, type II diabetes, cardiovascular related diseases, morbidity and mortality for a healthiness and wellness lifestyle of all societal class.

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