GHANA JOURNAL OF DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION, SPORTS AND DANCE (GJOHPERSD)

Volume 7 & 8, Year 2014 & 2015

A JOURNAL OF THE DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION
(HPER)
UNIVERSITY OF CAPE COAST
GHANA, WEST AFRICA

©Department of Health Physical Education and Recreation (HPER)
University of Cape Coast, West Africa

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopy, recording, or otherwise, without the prior written permission of the publishers

Published by:
Department of Health Physical Education and Recreation (HPER)
University of Cape Coast, West Africa

EDITORIAL BOARD

Editor-In-Chief

Prof. (Mrs.) Olufunmilola Leah Dominic	University of Cape Coast

Supervising Editors

Dr. Thomas Hormenu	University of Cape Coast

Assistant Editor

Dr. Edward Wilson Ansah	University of Cape Coast

EDITORIAL BOARD

Dr. Charles Domfeh	University of Cape Coast
Prof. Joseph K Mintah	University of Cape Coast
Prof. O.O.Obiyemi	University of Ilorin
Prof. Joseph Babalola	University of Ibadan
Prof. Grace Lartey	Western Kentuckey University
Prof.Oluwole A. Akeredolu	Lagos State University
Dr. Eugene K. M. Darteh	University of Cape Coast
Dr. Emmanuel Osei Sarpong	University Education, Wineba
Dr. Elvis Enowbeyang Tarkang	University of Health, and Allied Sciences

Editorial Comment

The Ghana Journal of Health, Physical education, Recreation, Sports and Dance (GJHPERSD) is a journal that published twice a year by the Department of Health, Physical Education and Recreation, University of Cape Coast, Ghana in which topical issues concerning exercise physiology, administration, health, biomechanical and behavioural aspect of physical and health education are publish. Majority of the articles are derived from researches and scientific investigation. Manuscripts in the present volume are selected by the Editorial Board from among submissions made by interested contributors. In these two issues, articles were compiled on differences in body anthropometry, factors influencing integration of primary school PE curriculum, food hygiene practices, safety measures of oil marketing company and reconciling the grading of students on teaching practice. The final determination is made on the basis of the professional and scientific relevance, need and extent of information to Health and Physical Education. The Editorial Board is receptive to suggestions concerning selections of potential manuscripts and topics worthy of publication. For the present volume, the Editorial Board wishes to acknowledge the contributions of our consultants and reviewers in the manuscripts.

Editorial Board
Ghana Journal of Health, Physical Education
Recreation Sports and Dance (GJOHPERSD)

GHANA JOURNAL OF HEALTH, PHYSICAL EDUCATION RECREATION SPORT AND DANCE

Vision

GJHPERSD is a peer-reviewed, DOUBLE BLIND, Professional Journal intended to meet the needs of Education, Health, Physical Education, Exercise Physiology, Sports Psychology, Nutrition, Sports Education, Sports Administration, and Sports Kinesiology. The journal publishes research that contributes to the knowledge and development of theory as new information, reviews, substantiation or contradiction of precious findings or as application of new or improved techniques to serve as a forum for socioeconomic, educational and ethical issues.

GUIDELINES FOR AUTHORS

The Editorial Board of the Ghana Journal of Health, Physical Education Recreation, Sports and Dance (GJHPERSD) is pleased to invite research articles, from interested scholars in both local and international community for consideration and subsequent publication. The journal is managed by the Department Health, Physical Education Recreation (HPER), under the Faculty of Science and Technology Education of the College of Education Studies, University of Cape Coast, Ghana.

Manuscript submitted to GJOHPERSD must not be published or submitted for publications simultaneously to other journal. Authors are responsible for the scientific content and legal aspect of the articles. There is 15 page limitation for the manuscript, including references. Manuscript acceptance is based on originality of materials significance to GJOHPERSD profession, validity and adherence to the prescribed submission requirements.

Submission of Manuscripts

Manuscript should be submitted electronically as e-mail attachment to

The Editor-In-Chief
GJOHPERSD
Department of Health, Physical Education and Recreation,
University of Cape Coast, Cape Coast, Ghana
E-mail gjohpersd@ucc.edu.gh

All submission must include a cover letter which should be sent as e-mail text; gjohpersd@ucc.edu.gh.

Manuscript Preparation

Manuscript should conform to the Publication manual of the American Psychology Association (APA, 6th edition) style and typed using 12 points Times News Roman with 1.5 line spacing including the following sections in articles. A length of 9-12 pages is a typical size for a manuscript, per the editorial policy of GJOHPERSD.

Title – Capital letters

Authors - Surname followed by initials, academic degree, position, and institutional affiliations of all the authors as well as corresponding author's mail address and telephone numbers.

Abstract - An abstract of not more than 250 words should include the purpose of the study, methods, major findings and conclusions. It should be typed using single line spacing. A maximum of 5 key words typed on a separate page

Text - **The text should** include the following headings

- Introduction
- Methods and Materials
- Results

- Discussion
- Conclusion
- Acknowledgement (if any)
- Reference and
- Appendices (if appropriate)

References – The American Psychological Association (APA 6th edition) format should be used and only references cited in the text should be alphabetically listed in the reference section.

The Review Process

The editor reviews all manuscripts for appropriateness of topics and conformity to GJOHPERSD writing style. If the topic and style are deemed appropriate, manuscripts are sent to at least 2 reviewers (DOUBLE BLIND REVIEW) with expertise in the topic area. Allow four 2 to 4 weeks for the review process.

GJOHPERSD now promotes OPEN ACCESS - OPEN PEER REVIEW SYSTEM and selects the best manuscripts for publication. Thus, the journal promotes total transparency and collaboration between author(s) and reviewer(s). The final decision is taken by the editor based on discussions and clarifications author - reviewer, and based on the final report on the manuscript.

The editorial staff requires that all manuscripts that are sent for publication to be evaluated.
A reviewed manuscript will be subjected to one of four possible outcomes regarding publication in GJOHPERSD.

1. Accept the paper in its current format if manuscript scores 80-100.
2. Accept the paper with minor changes; 65-79.
3. Resubmit with the major changes; 50-64.
4. Reject the manuscript; 0-49.

The decision will be communicated to the author(s) in a strictly anonymous form.

Publication Charges

Articles accepted for publication will attract publication charges that will be communicated to authors. The Accepted articles will be published online on the University E-Journals Website before the print copies. Manuscript will be printed in the earliest appropriate and available issue following acceptance. Authors will receive a complimentary copy of the issue in which their article appears.

A Journal of the Department of Health, Physical Education and Recreation (HPER), University of Cape Coast, Ghana.

TABLE OF CONTENTS

VOLUME 7
ISSUE 1, 2014

DIFFERENCES IN BODY ANTHROPOMETRY BETWEEN COMPETITIVELY EFFICIENT AND LESS EFFICIENT JUNIOR MALE HANDBALL PLAYERS

Adodo, S. M. & Agwubike, E. O
Institute of Education
University of Benin
Benin City, Nigeria
e-mail: samado2g4@gmail.com, samuel.adodo@uniben.edu

Department of Human Kinetics and Sports Science
University of Benin
Benin City, Nigeria
e-mail: ellydike70@gmail.com

Abstract

This study was carried out to determine if differences existed in anthropometric and body composition characteristics between competitively efficient (above average) and less efficient (average) junior male handball players. A total of 106 junior male handball players participated in this study. The players were divided into two playing quality or performance groups of above average or (competitively efficient) (n = 26) and average or competitively less efficient (n = 80) levels. A combination of individual players' quality as determined subjectively by a consortium of national handball coaches and team ranking achieved at a championship were used to achieve this purpose. 22 anthropometric attributes were measured for each subject. Similarly, 6 body composition variables were estimated. The results showed that the above average players were better endowed morphologically than the average players particularly in the Longitudinal Skeleton Dimensionality (LSD), Transverse Skeleton Dimensionality (TSD) and Absolute Voluminosity of the Body (AVB) dimensions. The junior male players at both levels of performance were relatively homogenous in the Subcutaneous Fatty Tissue (SFT). However, the

average level players had significantly lower supra spinale skinfold measure (t = 2.57, P < 0.011) than the above average level players. Derived body composition measures of skeletal mass (t = 5.80; p < 0.000); muscle mass (t = 4.87; p < 0.000); and fat free mass (t = 6.59; p < 0.000) were statistically significant in favour of the above average players. The mean (SD) somatotype of all the players (2.04[0.5]; 3.13[1.0]; 3.6[1.1]) were statistically significant. Similarly, the somatotype classification of meso-ectomorphic (mesomorphic ectomorph) characterised both levels of players (above average – 2.1[0.4], 2.85[0.8], 3.85[0.8] versus average - 2.01(0.5), 3.23[1.1], 3.54[1.2]) as there were no significant differences in these somatotype components. Results of the study demonstrated that the competitively efficient junior male handball players were significantly differentiated as possessing superior anthropometric characteristics compared to the less efficient junior male handball players.

Key words: Anthropometry, body composition, handball players, somatotype, morphological dimension

Introduction

Team handball was introduced into Nigeria in 1972 in preparation for the hosting of the 2nd All African Games (Handball Federation of Nigeria [HFN], 2000). Handball was listed as one of the events for competition for the first time in the history of All Africa Games. From that point, according to Adodo (2014), the game developed so fast and enjoyed a nationwide popularity perhaps next to soccer. This culminated in several successful high points in Nigeria's handball history. According to HFN (2000), Nigeria was the first African handball nation to win the African junior women handball championship for keeps after winning the 1986, 1988 and 1990 editions of the championship. Nigeria also hosted the 7th World Junior Ladies Handball Championships in Bauchi in 1989, becoming the first African country to host a world handball championship. It is also on the record of HFN that Nigeria has won the African Nation's cup in handball in the female category. Furthermore, the Nigerian Senior female team was indeed the first team sport apart from football, to represent Nigeria at the 1992 Barcelona Olympic Games. The senior national male team, also participated in the 1999 world male handball championship in Egypt, becoming the first of such a team from a black nation to participate at that level.

Overtime, the fortune of the game of handball in Nigeria began to record decline in spite of the initial successes that brought the game to enviable limelight and status in the eighties (Dauda, 2010). In this regard, sports professionals, administrators, researchers and other stake holders have related the causes of decline in handball performance overtime mostly to organisational problems. However, added to this is the fact that the need to identify, select and train young players who possess or have the potential to develop certain anthropometric, motor, physiological and other parameters of performance successes were often ignored (Adodo, 2014; Cavala, Rogulj, Srhoj, Srhoj & Katic, 2008). The implications of this, in practice, are that athletes suitability to compete efficiently at a particular level may depend on the

possession of these and other predictors of performance quality (Taborsky, 2007; Zapartidis et al., 2009).

Team success in modern handball game seems to depend on a number of factors that includes, among others, anthropometric characteristics, technical and tactical elements of the game (Srhoj, Marinovic & Rogulj, 2002). The anthropometric and body composition of players however, appear to have a fairly important role in determining performance at the highest level within team handball (Buchheit, Laursen, Kuhnle, Ruch, Renauch & Ahmaidi, 2009). Thus, practitioners and scientists have continuously sought to identify anthropometric and body composition characteristics that distinguish high and low class players (Granados, Izquierdo, Ibanez, Bonnabau & Gorostiaga, 2007; Gorostiaga, Granados, Ibanez, Gonzalez-Badillo & Izquierdo, 2006).

A number of studies in various team sports have provided relevant information regarding anthropometric characteristics and performance of players classified as competitively efficient (above average), and less efficient (average). For example, anthropometric characteristics of players in ball games such as soccer (Janssens, Van – Renterghan, Bourgeois & Vrijens, 2000); hockey (Elferink – Gemser, Visschar, Lemmink & Mulder, 2004); basketball (Cook, Kiss, Khan, Purdan & Webster, 2004); volleyball (Gabbett & Georgieff, 2007: Duncan, Woodfield & ai – Naskeeb, 2006); handball (Zapartidis et al, 2009; Hasan et al, 2007) and others are well documented. Specifically, Hirata (1979) and Khosla (1993) as cited in Hasan et al (2007) have demonstrated that the handball players in the medal winning teams possess significantly superior anthropometric qualities than the others, thus suggesting how important these qualities are to playing handball successfully. However, a few studies have also showed that the impact of anthropometrics does not always transfer to improved performance (Gabbett & Georgieff, 2007). In this regard, Roschel, Baptista, Monteiro et al (2009) showed that there is no significant difference in anthropometric data between winners and defeated karate players.

These studies have provided important information on the anthropometric and body composition characteristics of elite and

sub – elite players of other sports and of handball at the global level. Although these studies have compared anthropometric characteristics across age – categories and skill levels in youth sports, no known study has directly examined how anthropometric and body composition characteristics have contributed to playing quality within a developmental and representative group of junior male handball players in Nigeria. It is therefore difficult, based on research to date, to assume which anthropometric and body composition variables are able to discriminate between more homogenous (similar age and skill level) samples in a given sport context.

Assuming that handball players can be discriminated along playing quality (above average and average) in anthropometric and body composition dimensions, this study was carried out to determine if differences existed in anthropometric and body composition characteristics between competitively efficient (above average) and less efficient (average) junior male handball players. So far, it is not clear what the empirical situation has been as to identifying the anthropometric and body composition characteristics that discriminate playing quality of Nigerian junior male handball players. Determining these characteristics could become very important for predicting the young players' path to excellence in performance as well as point out talents for selection, training and development. On the basis of this, an hypothesis of no significant difference in the anthropometric and body composition characteristics of Nigerian junior male handball players of above average and average levels of playing quality was tested in this study:
There is.

Methods

Sample

The sample was made up of 106 junior male handball players from 7 out of the 15 states under 18 (U18) male handball teams that competed in the National male handball championship for the under 18 years age group. These state teams were

deliberately selected on the basis of their ranking/performance at the championships. Specifically, two top, three middle-order and two low-ranking teams eventually participated in the study. The purpose was to separate the subjects into two playing quality or performance groups of above average and average players.

A combination of individual player's quality as determined subjectively by a consortium of national handball coaches and team ranking in the championships were used to achieve this purpose. Players who were considered good enough to be invited to the national U18 team camp in preparation for a major sub-regional youth handball championship; and players in teams that attained the highest positions (1^{st}, 2^{nd}) in the final championship classifications were considered above average (n=26) in playing quality. Other players who did not make the coaches' list and did not attain the highest positions in the championship were grouped as average (n=80) in playing quality.

Variables

Anthropometric attributes, spread across the four presumed morphological dimensions of Longitudinal Skeleton Dimension (LSD), Transverse Skeleton Dimension (TSD), Absolute Voluminosity of Body (AVB), and Subcutaneous Fatty Tissue (SFT) (Cavala et al, 2008) were measured (Table 1). The Body Composition Variables (Table 2) were estimated.

The Longitudinal Skeleton Dimension of height was measured on a stadiometer (GPM, Serifex, Inc., East Rutherford, New Jersey), while the steel anthropometry tape (Lufkin W606PM, Rosscraft, Surrey, UK) was used to measure arm span. Arm length (acromiale – radiale) and hand length (midstylion – dactylion) were measured using Campbell 20 large sliding caliper with A–P branches (Rosscraft, Surrrey, UK) respectively. The Martin – type Siber-Hegner anthropometer (GPM, Serifex, East Rutherford, USA) was used to measure leg or tibial length (tibial – mediale).

All circumference measures (TSD) were taken using steel anthropometry tape (Lufkin W606PM, Rosscraft, Surrey, UK) – The Campbell 10(18) small sliding caliper was used to measure the

diameter or girth of all the AVB variables. Body weight, however, was measured with OMRON BF 400 body fat monitor. The skinfold thickness of identified SFT sites were determined using calibrated Harpenden skinfold calipers. The body composition variables of skeletal, muscle and fat free masses as well as somatotype were estimated using procedures recommended by International Society for the Advancement of Kinanthropometry (ISAK) (2001). The obtained values for the lengths, breadth and girths were within the established criteria of 0.2cm tolerance level; while the skinfold measurements were within 5% tolerance level as recommended by Marfell–Jones (2003).

These instruments were previously validated in different research settings and populations (Ingebrigsten & Jefferys, 2012; Cavala et al, 2008; Katic, Grgantov & Jurko, 2006). Sufficiently high intra – class correlation coefficient of 0.98, 0.98, 0.95, 0.96 and 0.96 with corresponding technical error of measurement (TEM) of 0.2%, 0.3%, 0.5%, 0.3% and 0.2% were obtained for the LSD, TSD, AVB, SFT variables respectively. These indicate acceptable reliability based on established criteria by Hopkins (2000).

Data collection

All anthropometric measurements were taken by the same investigator and three trained assistants on the handball court for the three days, at the same specified time and completed in the same order. Measurements were taken on the players' dominant side so that differences caused by continuous use of the dominant side of the body in competition and training do not invalidate the measurement results (Srhoj et al, 2002). Each participant was informed of the procedures and provided signed written consents in accordance with the University of Benin, Nigeria research ethics procedures. Participants were required to appear in minimum clothing and "landmarked" thereafter.

Statistical analysis

Mean and standard deviation (SD) scores were calculated for all dependent variables (anthropometric attributes) with level of playing quality (above average and average) acting as the independent variable. The independent t – test analysis of difference was used to determine differences in anthropometric attributes between the above average and average players. The statistical package for social sciences (SPSS) IBM version 20 was used for all analysis with significance set as $p<0.05$.

Results

The descriptive and inferential statistics of the difference in anthropometric and body composition characteristics between the above average players (AAP) and the average players (AVP) are presented in Tables 1 and 2. The consortium of coaches considered 26 players, representing 25% of the total sample as above average in playing quality, while 80 players or 75% of the total sample were considered average in playing quality.

Generally, the AAP had larger overall mean scores in almost all the anthropometric variables under consideration than the AVP; they were particularly taller ($t=7.62$; $p<0.000$) and heavier ($t=6.27$; $p<0.000$) than the AVP. In the longitudinal skeleton dimensions of anthropometrics, the AAP were better endowed than the AVP in arm length ($t=4.42$; $p<0.000$); hand length ($t=2.33$; $p<0.028$); leg length ($t=5.38$, $p<0.000$) and arm span ($t=4.58$, $p<0.000$). Significant differences in three anthropometric transverse skeleton dimensions (TSD) of handbreadth ($t=3.32$, $p<0.001$); wrist breadth ($t=3.57$, $p<0.001$); and femur breadth ($t=5.00$; $p<0.000$) were also recorded in favour of AAP. However, there were no significant differences in humerus breadth ($t=1.06$, $p<0.056$).

Table 1: Descriptive statistics and t – test analyses of differences in anthropometric characteristics mean scores according to playing quality

Variables	All players N = 106 Mean (SD)	Playing Quality		t	p-value
		Above Average n = 26 Mean (SD)	Average n = 80 Mean (SD)		
Body height (cm)	173.37(7.3)	181.02(5.4)	170.88(6.9)	7.62	0.000*
Arm length (cm)	31.79(2.2)	33.33(2.2)	31.29 (2.0)	4.41	0.000*
Hand length (cm)	20.50(1.9)	21.21(1.1)	20.27 (2.1)	2.23	0.028*
Leg length (cm)	39.46(2.6)	41.60(2.9)	38.77 (2.1)	5.38	0.000*
Arm span (cm)	184.38(9.6)	191.21(9.1)	182.16(8.7)	4.58	0.000*
	Transverse Skeleton Dimensionality (TSD)				
Hand breadth (cm)	8.25 (0.5)	8.50 (0.4)	8.17 (0.5)	3.32	0.001*
Wrist breadth (cm)	5.50 (0.5)	5.79 (0.6)	5.41 (0.4)	3.57	0.001*
Humerus breadth (cm)	6.20 (0.5)	6.28 (0.4)	6.17 (0.5)	1.06	0.293*
Femur breadth (cm)	8.52 (0.5)	8.87 (0.4)	8.40 (0.4)	5.00	0.000*
Ankle breadth (cm)	6.65 (0.5)	6.79 (0.4)	6.60 (0.5)	1.94	0.055*
	Absolute Voluminosity of Body (AVB)				

Body weight (kg)	61.86 (7.6)	68.82 (7.1)	59.60 (6.3)	6.27	0.000*
Arm girth (R)(cm)+	26.74 (1.9)	27.77 (1.6)	26.40 (1.9)	3.41	0.001*
Arm girth (F) (cm)++	29.78 (2.3)	31.23 (2.1)	29.31 (2.2)	3.99	0.000*
Chest girth (cm)	85.59 (4.6)	89.31 (4.3)	84.39 (3.9)	5.38	0.000*
Mid-thigh girth (cm)	47.57 (4.1)	49.39 (3.9)	46.98 (3.9)	2.69	0.000*
Calf girth (cm)	34.01 (2.3)	34.92 (2.4)	33.72 (2.2)	2.34	0.021*
	Subcutaneous Fatty Tissue (SFT)				
Triceps SF (mm)	6.27 (1.8)	6.42 (1.4)	6.25 (1.9)	0.48	0.631
Subscapular (mm)	8.50 (2.2)	9.42 (2.3)	8.20 (2.1)	2.57	0.011*
Supraspiniale SF (mm)	6.31 (1.4)	6.69 (1.8)	6.19 (1.3)	1.56	0.122
Abdominal SF (mm)	8.31 (2.2)	8.81 (2.4)	8.15 (2.1)	1.34	0.184
Front of thigh SF (mm)	7.58 (2.3)	7.81 (2.3)	7.51 (2.3)	0.57	0.572
Medical calf SF (mm)	6.64 (1.9)	6.89 (2.4)	6.56 (1.7)	0.74	0.458

Keys:*****significant at 0.05; cm = centimeter; Kg = Kilogram; += relaxed arm girth; ++ = flexed arm girth; kg/m^2 = kilogram per meter; SF = skinfold

Table 2: Descriptive statistics and t – test analyses of difference in body composition characteristics according to playing quality

Variables	All players N = 106 Mean (SD)	Playing Quality		t	p – value
		Above Average n = 26 Mean (SD)	Average n = 80 Mean (SD)		
Skeletal mass (kg)	7.54 (0.9)	8.36 (0.8)	7.27 (0.9)	5.80	0.000*
Muscle mass (kg)	29.44 (2.9)	31.60 (2.6)	28.73 (2.6)	4.87	0.000*
Fat free mass ($kg/m^{0.14}$)	54.87 (6.0)	60.57 (5.1)	53.01 (5.1)	6.59	0.000*
Body mass index (kg/m^2)	20.45 (1.9)	20.90 (1.5)	20.30 (2.0)	1.41	0.162
% Body fat	10.76 (3.5)		10.39	1.91	0.059
	11.89 (3.6)		(3.5)		
Endomorphy	2.04 (0.5)		2.01	0.88	0.379
	2.12 (0.4)		(0.5)		
Mesomorphy	3.13 (1.0)	2.85 (0.8)	3.23 (1.1)	1.67	0.098
Ectomorphy	3.61 (1.1)	3.85 (0.8)	3.54 (1.2)	1.27	0.208

Keys:*****significant at 0.05; cm = centimeter; Kg = Kilogram; kg/m^2 = kilogram per meter; SF = skinfold.

The mean differences obtained for the absolute voluminosity of body (AVB) anthropometric parameters in relaxed arm girth (t=3.41, p<0.000), flexed arm girth (t=3.99, p<0.000);

chest girth (t=6.38, p<0.000); mid – thigh girth (t=2.69, p<0.000); and calf girth (t=6.38, p<0.000) were statistically significant. In the area of subcutaneous fatty tissue (SFT), the mean difference in the subscapular skinfold (t=2.51, p<0.011) was the only recorded statistically significant result. Derived body composition measures of skeletal mass (t=5.80; p<0.000); muscle mass (t=4.87; p<0.000); and fat free mass (t=6.59; p<0.000) were statistically significant. The somatotype classification of mesomorphic ectomorph characterised both levels of players as there were no significant differences in the somatotype components. These results showed that the AAP were better endowed morphologically than the AVP particularly in the longitudinal skeleton and absolute voluminosity of body dimensions.

Discussion

Cavala et al (2008) in a study of elite female handball players reported that the above average players were sufficiently discriminated from the average players in all anthropometric variables except in height, arm span and leg length. The study measured differences in anthropometric variables in junior male handball players classified as competitively efficient (above average) and less efficient (average). The results of the study evidently showed that the above average players were superior to the average players in most of the anthropometric and body composition variables. A comparison of the results obtained in this study with those reported for younger and older top level, male and female handball players revealed proportionally identical values in large number of anthropometric variables. For example, Mohamed et al (2009) found significant differences in most anthropometric attributes in their elite and non-elite under 16 handball players. Similarly, Hasan et al (2007), in a related study where players were divided into two groups of successful and unsuccessful teams on the basis of performance at a championship, reported that the more successful teams had better endowed players than in the less successful teams in terms of anthropometric characteristics. This goes to suggest that these attributes underpin playing success in handball.

However, when comparing the obtained anthropometric and body composition characteristics of handball players to the results reported for athletes from other sports, certain similarities and differences may be observed. Roschel and Colleagues (2009) showed that there were no significant differences in anthropometric measures between winner and defeated karate players. Gabbett et al (2007) and Elferink-Gemser et al (2004) in studies examining homogenous (junior elite and sub-elite) samples of volleyball and field hockey players respectively, also found no significant differences in anthropometric characteristics. Similarly, Nicolaire, Correa and Böhme (2010) found the total and corrected thigh circumferences as the only anthropometric variables with statistically significant group differences (elite vs. non-elite). In specific terms, the results of the present study showed that the above average players achieved higher values than the average players in all of the LSD and AVB anthropometric features. Taborsky (2007) identified features of LSD as advantageous bio-markers of success in playing the game of handball. Higher measures of LSD, according to Srhoj, et al (2002) are of utmost importance because they could facilitate and enhance shooting and defensive effectiveness of players. In the AVB, the superiority of the above average players may, in part, be explained by the impact of training process on the muscle tissue increase (Grgantov et al, 2006). This is further reflected in the significantly higher values recorded by the above average players in both the muscle mass, fat free mass and some skeletal transverse measures. It could be conjectured, therefore, that the above average players may have had more and perhaps, better training schedule and routines than the average players.

It is obvious also that there were no significant differences in almost all the variables assessing subcutaneous fatty tissue (SFT) and some body composition variables (%BF, BMI, and Somatotype) among junior male handball players. Cavala et al (2008) also reported no significant difference in most of the subcutaneous fatty tissue (SFT) variables between the groups of playing quality or proficiency. In that case, the junior players at

both levels of performance were relatively homogenous in these body anthropometry variables. Some authors (Boracznski & Urniaz, 2008; Duthie et al, 2006; DeRidder, 2003) have shown that excessive SFT in athletes, particularly %BF, will exert unfavourable effect on performance. In this case, however, the above average players seem to possess higher adipose tissue, although not significantly different from the value recorded for the average players. For example, the expectation, perhaps, was that the % fat mass of above average players would be considerably lower than that of the average players.

Generally, the significant superiority of the above average players in most of the body anthropometry measures may have resulted from the process of selection more than training or any other technical input. Tomkinson and Olds (2002) opined that body type and success of athletes may have evolved as a result of environmental and genetic traits. Rakovac and Colleagues (2011) supported this view, stating that success in a given sport is the result of a combination of heredity, training and nutrition, as well as environmental and socio-cultural influences. As such, players who are endowed and who have been able to adapt to identified anthropometric insufficiency by compensating with the development of appropriate skills to specific demands of a sport during training will most likely be selected by coaches.

Finally, the similarities and differences in obtained results seem to support the assertion (Grgantov et al, 2006; Young, et al, 2005) that comparisons between groups that are substantially different in performance level can be misleading. This is because they tend to overstate the importance of physical qualities towards playing success. Tsolakis and Vagueas (2010) hold the view that classical anthropometric attributes must be seen and treated as simple descriptors rather than determinants of playing quality or efficiency. A better picture of players with superior body anthropometry and playing efficiency would be better determined if these attributes are combined with other performance parameters like motor ability, technical skills and tactical knowledge (Till, K. et al, 2011). The non – assessment of motor ability, technical and

tactical skills and other determinants of playing success is a limitation in the present study.

Conclusion

The results of this study have shown conclusively that the above average players were significantly differentiated as possessing superior anthropometric characteristics. In specific terms, the above average players obtained statistically significant differences in LSD, AVB, and in some TSD measures. These may have obviously accorded significant performance advantage to the above average players. The junior male players at both levels of performance were relatively homogenous in the SFT and some body composition (%BF, BMI and Somatotype) measures. These results, if disseminated, will provide relevant research based information/data about junior male handball players considering the paucity of such data in Nigeria. Data obtained from this study could also satisfy the needs of coaches, physical educators, athletic trainers and others for empirical based information about player characteristics necessary to detect and select potential players for training and development. It will also help to provide information necessary to evaluate the progress of players from one age level to another with a view to a better development of youth sports in general and handball in particular.

References

Adodo, S. M. (2014). Anthropometric characteristics and motor abilities of Nigerian junior male handball players. Unpublished doctoral dissertation, University of Benin, Benin City, Nigeria.

Boracynski, T. & Urniaz, J. (2008). Changes in aerobic and anaerobic power indices in elite handball players following a 4 – week general fitness mesocycle. *Journal of Human Kinetics, 19,* 131 - 140

Buchheit, M., Laursen, P. B., Kuhnle, J., Ruch, D., Renand, C., & Ahmaidu, S. (2009). Game-based training in young elite

handball players. *International Journal of Sports Medicine, 30,* 251 – 258.

Cavala, M., Rogulj, N., Srhoj, V., Srhoj, L. & Katic, R. (2008). Biomotor structures in elite female handball players according to performance. *Collegiums Anthropologicium, 32*(1), 231 – 239.

Cook, J. L., Kiss, Z. S., Kahn, K. M., Purdan, C. R., & Webster, K. E. (2004). Anthropometry, physical performance and ultra sound patellar tendon abnormality in elite junior basketball players: A cross – sectional study. *British Journal of Sports Medicine, 38*, 206 – 209.

Dauda, Y. (2010). *President's remark*. Programme for the National under 18 and 21 handball boys and girls championship. Minna, 31st July – 7th August.

DeRidder, J. H. (2003). Nigeria All Africa Games Research Project (NAAGReP): *Anthropometry Accreditation Course* (Level 2): 24th – 27th September.

Duncan, M. J., Woodfield, L. & ai-Nakeeb, Y. (2006). Anthropometric and physiological characteristics of junior elite volleyball players. *British Journal of Sports Medicine, 40*, 649–651. Retrieved October 25, 2010 from http://bjsm.bmj.com

Duthie, G. M., Pyne, D. B., Hopkins, W. G., Livingstone, S. & Hooper, S. L. (2006). Anthropology profile of elite rugby players: Qualifying changes in lean mass. *British Journal of Sports Medicine, 40*, 202-207

Elferink – Gemser, M., Visscher, C., Lemmink, K. & Mulder, T. (2004). Relation between multi – dimensional performance characteristics and level of performance in talented youth field hockey players. *Journal of Sports Science*, *22*, 1053 – 103.

Gabbett, T. J., Georgieff, B. & Domrow, H. (2007). The use of physiological, anthropometric and skill data to predict selection in a talent identified junior volleyball squad. *Journal of Sports Science, 25*, 1337 – 1344.

Granados, C., Izquierdo, M., Ibanez, J., Bonnabau, H., & Gorostiaga, E. M. (2007). Differences in physical

fitness and throwing velocity among elite and amateur female handball players. *International Journal of Sports Medicine, 28*(10), 860-867.

Gorostiaga, E., Granados, C., Ibanez, J., Gonzalez-Badillo, T. & Izquierdo, M. (2006). Effects of an entire season on physical fitness changes in elite male handball players. *Medicine and Science in Sports and Exercise, 38*(2), 357-366.

Grgantov, Z., Katic, R. & Jankovic, V. (2006). Morphological characteristics, technical and situation efficacy of young female volleyball players. *Collegiums Anthropologicum, 30*(1), 87 – 96.

Hasan, A. A., Rahaman, J. A., Cable, al. T. & Reilly, T. (2007). Anthropometric profile of elite male handball players in Asia. *Biology of Sports, 24*(1), 3 – 12.

Handball Federation of Nigeria (HFN, 2000). Programme of events for Malta Guinness National handball League Championship, Owerri, 17 – 27 May.

Hopkins, W. G. (2000). Measures of reliability in sports medicine and science. *Sports Medicine, 30*, 1 – 15.

Ingebrigsten, J. & Jeffery, T. (2012). The relationship between speed, strength and jumpingabilities in elite junior handball players. *Serbian Journal of Sports Science, 6*(3), 83 – 88.

Janssens, M., Van-Renterghen, B., Bourgeois, J., & Vrijens, J. (2010). Physical fitness and specific motor performance of young soccer players aged 11 – 12 years. *Journal of Sports Science, 16*, 434 – 435

Marfell-Jones, M. (2003). *Guidelines for athlete assessment in New Zealand sport: Kinanthropometric assessment*. Retrieved on 15th October 2010 from http://homepages:hug.co.nz/rip/anthropometry/

Mohamed, H., Vaeyens, R., Matthys, S., Multael, M., Lefevre, J., Lenoir, M., & Philippaerst, R. (2009). Anthropometric and performance measures for the development of a

talent detection and identification model in youth handball. *Journal of Sports Sciences, 27*(3), 257 – 266.

Nicolaire, A. H., Correa, U. C., & Bohme, M. T. (2010). Anthropometric and motor skills in talent selection and development in indoor soccer. *Perceptual and Motor Skills, 110*(3), 916 – 930.

Rakovac, M., Smoljanovic, T., Bojanic, I., Hannafin, J. O., Hren, D., & Thomas, P. (2011). Body size changes in elite junior rowers: 1997 – 2007. *Collegiums Anthropologicum, 35* (1), 127 – 131.

Roschel, H., Baptista, N., Monteiro, R., Bertuzzi, R. C., Barroso, R., Loture, I., Ugrinowitsch, C., Tridoli, V., & Franchini, E. (2009). Association between neuromuscular tests and kumite performance on the Brazillian karate national team. *Journal of Sports Science and Medicine, 8*(CSSS 13), 20 – 24.

Srhoj, V., Marinovic, M. & Rogulj, N. (2002). Position specific morphological characteristics of top level male handball players. *Collegiums Anthropologicum, 1*, 219 – 227.

Taborsky, F. (2007). *The body height and top team handball players*. EHF web periodicals, September. Retrieved October 15th, 2010 from http://activities.eurohandball.com on

Till, K., Cobley, S., & O' Hara, J., Brightmore, A., Cooke, C. & Chapman, C (2014). Using anthropometric and performance characteristics to predict selection in junior UK Rugby League Players. *Journal of Science and Medicine in Sports, 14*(3), 264 – 269.

Tomkinson, G. R. S., & Olds, T. S. (2002). Talent identification: The brave new world. *Proceedings of 2002 KNUPE International Symposium*, *21*(1), 85 – 102.

Tsolakis, C., & Vaqueas, G. (2010). Anthropometric, physiological and performance characteristics of elite and sub – elite fencers. *Journal of Human Kinetics, 23*, 89 – 95.

Young, W. B., Newton, R. U. Doyle T. L. (2005). Physiological and anthropometric characteristics of starters and non starters and playing positions in elite Australian Rules

football: a case study. *Journal of Science & Medicine in Sport*, *8*, 335 – 345.

Zapartidis, I., Tonganidis, T., Vareltzis, I., Christedoulidis, T., Kororos, P. & Skoufas, D. (2009). Profile of young female handball players by playing position. *Serbian Journal of Sports Science, 3*(1–4), 53 – 62. Retrieved October 14, 2010 from http://www.sjss.sportsacademy.edu on.

OPINION OF PHYSICAL EDUCATION TEACHERS ON FACTORS INFLUENCING INTEGRATION OF PE INTO PRIMARY EDUCATION CURRICULUM IN OYO STATE

Ibraheem, T. Olanrewaju, OJO, Ayorinde Victor & Ibraheem, M. Oluwatoyin

Department of Human Kinetics and Education, University of Ilorin, Nigeria
infoiot@yahoo.com; ibraheem.to@unilorin.edu.ng
08033380286

Abstract

This paper highlights the opinion of primary school Physical Education (P.E) teachers on the factors influencing integration of physical education into primary education curriculum in Oyo State. The paper tries to examine the meaning of curriculum as advanced by some scholars. It discusses the indispensable need for proper curriculum implementation. Moreover, an important focus of the paper pivots on the factors influencing the integration of Physical Education in primary school curriculum. Descriptive research design was used for this study. The population for this study consists the primary school teachers in Ibadan South West Local Government Area of Oyo State. 149 subjects were served with questionnaire to elicit responses on their opinions regarding factors influencing integration of P.E into primary education curriculum in Oyo State. Descriptive and inferential statistical analyses of chi square (X2) were used to test the hypotheses that were generated at a significant relationship of 0.05 alpha levels. The result of the findings revealed that, time allotted to P.E in primary schools have an influence on integration of P.E in the primary school curriculum. It also revealed that, availability of sport facilities and other infrastructure for P.E classes in primary schools have positive influence on integration of P.E in the primary school curriculum. It was also revealed in the paper that,

DIFFERENCES IN BODY ANTHROPOMETRY BETWEEN COMPETITIVELY EFFICIENT AND LESS EFFICIENT JUNIOR MALE HANDBALL PLAYERS

Adodo, S. M. & Agwubike, E. O
Institute of Education
University of Benin
Benin City, Nigeria
e-mail: samado2g4@gmail.com, samuel.adodo@uniben.edu

Department of Human Kinetics and Sports Science
University of Benin
Benin City, Nigeria
e-mail: ellydike70@gmail.com

Abstract

This study was carried out to determine if differences existed in anthropometric and body composition characteristics between competitively efficient (above average) and less efficient (average) junior male handball players. A total of 106 junior male handball players participated in this study. The players were divided into two playing quality or performance groups of above average or (competitively efficient) (n = 26) and average or competitively less efficient (n = 80) levels. A combination of individual players' quality as determined subjectively by a consortium of national handball coaches and team ranking achieved at a championship were used to achieve this purpose. 22 anthropometric attributes were measured for each subject. Similarly, 6 body composition variables were estimated. The results showed that the above average players were better endowed morphologically than the average players particularly in the Longitudinal Skeleton Dimensionality (LSD), Transverse Skeleton Dimensionality (TSD) and Absolute Voluminosity of the Body (AVB) dimensions. The junior male players at both levels of performance were relatively homogenous in the Subcutaneous Fatty Tissue (SFT). However, the

A teacher is described as the professional who imparts knowledge, learning experiences at his or her disposal to stimulate, guide, direct and facilitate learners to acquire adequate mastery of the skills being imparted. Ajayi, (2004) defined a teacher as someone who causes learning to take place; someone who imparts knowledge, skills, values and attitudes to a group of learners. From the definitions, it is clear that, a teacher is one who helps the learners, often in a school, as well as in a family, religious and community setting.

Curriculum is learning experiences to which the learner is subjected, under the guidance of the school (Mezieobi, Fubura and Mezieobi, 2008). Alaezi (1989), submitted that, the school curriculum is at the heart of education, and so, to the extent which one can become dependent or independent is subjected to the level, the content and method of his or her education. Curriculum therefore could be said to be the bedrock of education, hence its functionality must be held in high esteem so as to achieve the aims as justified by the meaning of education.

This is referred to as education given in an institution for children above ages 6 to 11 plus. Primary education is made compulsory, universal and tuition free in the Nigerian public schools. All the subjects in the primary education curriculum, including physical and health education are offered as core-subjects (National Policy on Education, 2004). The term, curriculum implementation has been defined in different ways by various scholars. Babalola (2004) described curriculum implementation as: “the translation of the objectives of the curriculum from paper to practice”. Mkpa (2005) defined curriculum implementation as: “the task of translating the curriculum document into the operating curriculum by the combined efforts of students, teachers and others concerned. Onyeachu (2008) viewed curriculum implementation as the process of putting all that have been planned as a curriculum document into classroom through the combined effort of the teachers, learners, school administrators, parents as well as interaction with physical facilities, instructional materials, psychological and social environments.

Ivowi (2004) defined curriculum implementation in a nutshell as; "the translation of theory into practice, or proposal into action". Curriculum implementation is viewed as: "putting the curriculum into work for the achievement of the goals for which the curriculum is designed (Garba, 2004). Critically looking at these definitions, it shows that, curriculum implementation is the interaction between the teachers, learners and other stake holders in education geared towards achieving the objectives of education. It is also evident from the above definitions that, curriculum implementation is indispensable. However, despite the need for proper implementation of the curriculum, there are certain factors militating against its successful implementation.

Physical Education as a teaching subject, has suffered neglect in Nigerian educational institutions in the past, as its scope was limited to exercises, physical drills or muscle building. In recent times, the Nigerian educators had agreed that, Physical Education/Human Kinetics be integrated into the school curriculum as a teaching subject. The Federal Government of Nigerian in its policy on education (National Policy on Education 1981, 2004) therefore, had stressed the need to direct the quality of instruction at all levels, towards the promotion of educational, physical and psychological health of all children among others. This will enable them become functional and productive members of the society. Thus, a functional Physical Education
Programme in all educational institutions must be vigorously pursued if appropriate skills, abilities and competences (both mental and physical) needed to equip the individuals to live in and contribute meaningfully to the development of the society must be achieved. It is in full realization of this assumption, that the Federal Government of Nigeria approved the inclusion of Physical and Health Education Curriculum into educational institutions at all levels.

Despite the importance of Physical education to man's day today's running, it is rather appalling that, there is a decline in the participation of Physical Education programme in educational institutions in Nigeria owing to many variables. Physical Education, like any other discipline in the school curriculum, has

many challenges in participation towards achieving its set goals and objectives in schools. Generally, certain problems cut across all educational institutions. The abolition of Teachers' Grade II

Colleges in Nigeria, where foundation of Physical Education, as a discipline and course of study was laid, is identified as a determinant in the declining profile of the programme in schools in Nigeria (Isaac & Johnson, 2014). Physical Education facilities and equipment are expensive, thus requiring a large sum of money to procure. Unfortunately, Physical Education and sport facilities as well as equipment are grossly inadequate for teaching of the subject in most Nigeria, educational institutions. Most institutions do not have minimum standard of facilities and equipment. Even what is available in the universities where the basic skills needed to teach the subject is required, it is grossly inadequate relatively. Cultural and religious taboos in some communities, inhibit children from exposing some parts of their bodies (their hand, legs and thighs) during Physical Education practical lessons. Such restrictions normally have detrimental effects on the effective participation in Physical Education.

Physical Education as a lesson, is on the timetable of almost all the schools, but it is unfortunate that, there are no Physical Education teachers to handle the lessons. The Teachers' Grade II programme has been cancelled. Though, it is the government policy that, the least qualification for primary school teachers should be Nigerian Certificate in Education (N.C.E). It is only in private primary schools that one can find N.C.E and University degree holders and this is because, jobs are very difficult to come by in the country presently (Edim, Emeribe & Akah 2010). There is a general belief that, physical education in schools is dominated by team games and that, too little time is spent in more individual-based physical activities (Halbert & MacPhail,
2005).The result is that, too much emphasis is placed on performance and winning, rather than on learning and individual improvement. Ross and Gilbert (1985) noted that, although there was an upward trend across age groups and that, only a small amount of the physical education curriculum was devoted to

participation in lifetime physical activities. The reasons for this may include large class sizes, inadequate facilities and a lack of teacher confidence in teaching all the areas in the curriculum, resulting in a neglect of other strands of the physical education curriculum.

Economic and social class, gender and tribe are interconnected because; they limit Physical Education and sports participation among students from low-income background. Opportunities to be accepted into the academic discipline were very limited for Physical Education and sports. According to Adedeji (1985 and 2001), few Physical Education specialists in the past, achieved fame and fortune in sports, but because of perceived obstacles to achievement like other careers, many young specialists in contemporary society see Physical Education and sports participation as an occupation in its glorious height only. In relation to social class, employment, economy and income, the changes that have occurred in recent years, seem to be most visible in relation to employment. Unfortunately, students' enrollment for Physical Education in the tertiary institutions in Nigeria has declined dramatically (Henderson, 1996). The few textbooks available on Physical Education and sports written by Nigerian authors emphasize mainly games and sports skills, neglecting other aspects of the programme (Isaac & Johnson, 2014).

In addition to the above discussed problems affecting the integration of physical education into primary school curriculum, the following factors also adversely affect its success:

Inadequate funding of the education sector has been a major challenge facing the sector. Researchers, Aina (2002), Durosaro (2006), Amadi (2007); Balogun (2010) lamented over the inadequacy of fund in the education sector. It is not an understatement to note that, the Nigerian government, over the years, as reported by Isaac and Johnson, (2014) has not been meeting the UNESCO recommendations of 26% of the total budgetary allocation to the education sector. For example, the allocation to Education in the National Budget for 2003, 2004 and 2005 were 7%, 12% and 11% (FRN 2005). According to Akindutire (2001), the poor funding of the teacher education since

the 1980s has become a cause of worry to educationists as it affects the merits and standard of the certificates awarded to education graduates. Professionalization of the teachers' profession would give the profession a better image, thus making the code of ethics respected.

In making a professional teaching qualification mandatory, government should make it compulsory for all in the teaching jobs, at all levels, in order to acquire teaching qualifications. Government should give another deadline within a convenient time-frame to ensure that, by 2015, all teachers would have become professionals. This is because the 2006 deadline as seen in the TRC Act had failed, 2006 had come and gone and nothing much had been done to ensure that, all teachers are professionalized. Thanks to some state Governments in Nigeria that gave, a salary differential in the payment of the Teachers' Salary Structure (TSS). While teachers with educational background enjoy 27.5%, those without education certificate enjoy 12.5% (Isaac & Johnson, 2014). There is also the need for improvement in the level of the infrastructural facilities in schools. This however, depends to a large extent, on the level of funding made available to the system. Ibukun (2004) advocated for modern educational gadgets; like computers, modern instructional materials, packages as well as other practical facilities to be consciously introduced into the teacher education programme. It must be noted that, no programme, no matter how well intended, can succeed if adequate infrastructural facilities are not provided for implementation. Ibukun (2014) further explained that more time should be provided for practical work before students are certified as teachers. There is the need to review upward, the twelve weeks of internship for education students in the university. To provide sound teacher education in future, the present curriculum need to be reviewed so as to provide more time for students in the practical aspect of teaching before certificates are awarded to them as qualified teachers. The time allotted for the teaching of Physical Education in primary schools should also be reviewed up. More time should be given for teaching the subject as only then can a meaningful impact be felt.

Purpose of the Study

This study attempts to describe the opinion of PE teachers on factors influencing integration of PE into primary education curriculum in Oyo state using the Ibadan Municipal Grammar School & St. Michaels Primary School in the Ibadan South West Local Government Area as a case study with a view to proffering solutions, to the lingering problem of decline in participation in Physical Education.

Statement of the Problem

The rocket-speed decline in the rate of children's participation in physical education is an important issue that needs to be addressed to ensure continuity of the subject. Pupils' perception is that, physical and health education is an optional subject, hence the commitment of a nonchalant attitude towards participation in it. The understanding of elective is that, the subject is optional. It is likely that, greater percentage of pupils would drop any subject which is made optional. There is a need for P.E to be made a core subject at all levels of education in Nigeria. Several researchers including Edim, Emeribe and Akah (2010) have tried to highlight the need for the promotion of physical education as a core subject in Secondary Schools, but much has not been done on primary schools in the Ibadan South-West Local Government Area of Oyo State, hence the need for this research.

Research Questions

For the purpose of this study, the following research questions were formulated in order to carry out the research:

1) Will the time allotted to P.E in primary schools have any influence on the integration of P.E in the primary school curriculum?
2) Will the availability of funds have any influence on integration of P.E into the primary school curriculum?
3) Will availability of sport facilities for P.E practical classes in primary schools have any influence on integration of P.E in the primary school curriculum?

4) Will disseminating information on the need for participation in PE by the government have any influence on integration of P.E in the primary school curriculum?

Hypotheses

1) Time allotted to P.E in primary schools will have an influence on integration of P.E in the primary school curriculum.
2) Availability of sport facilities for P.E practical classes in primary schools will not have any influence on integration of P.E in the primary school curriculum.
3) Availability of funds will not have any influence on integration of P.E into the primary school curriculum.
4) Dissemination of information on the need for participation in PE by the government will have a positive influence on integration of P.E in the primary school curriculum.

Methodology

The design for the study is based on survey method. Bobade (2003), described survey method of research as a brand of descriptive research in as much as it deals with the present description of variables, situations, events, phenomena, etc and the relationships between them. Bobade (2003) further said, it involves the systematic study of a population on a particular phenomenon exhibited by the population.

Population and Sampling Procedure

The sampled population comprised of 159 primary school teachers from the eight (8) public primary schools available in Ibadan South West Local Government Area of Oyo State, i.e the St. Michael's African Primary Schools 1 to 7 and Ibadan Municipal Grammar School. The population was purposively and randomly sampled. The total target population therefore was 149 subjects, using the random number table as provided by The Research Advisors (2006) to represent the 159 primary school PE teachers available in the Ibadan South West Local Government Area of Oyo State.

Research Instrument

The research instrument for data collection is the questionnaire designed by the researcher to collect information on opinion of PE teachers on factors influencing integration of PE into primary education curriculum in Oyo State. A total of 149 questionnaire were distributed to the respondents by the investigator with the aid of three research assistants and the filled-in questionnaire were also collected immediately after the respondents had completed filling them.

Data Analysis

The information collected through the questionnaire was subjected to inferential statistical analysis of chi square (X_2) in order to test the hypotheses for significant relationship of 0.05 alpha level.

Results of finding: Table 1: Contingency and Chi-Square table on Time & Curriculum Integration.

Item	SA	A	D	SD	ROW TOTAL	df	Cal. X^2	CRITICAL VALUE	DECISION
1	8	16	92	33	149				
2	97	35	8	9	149	6	12.592	264.73	Fail to reject
3	88	52	5	4	149				
TOTAL	193	103	105	46	447				

Alpha value 0.05

Table 1 revealed that, the calculated chi square (X_2) value of 12.592 is lower than the critical value of 264.73 at 0.05 level of significance and degree of freedom (df) of 6. Therefore, we fail to reject the Null hypothesis. Consequent to the Accepted hypothesis, time allotted to P.E in primary schools will have an influence on integration of P.E in the primary school curriculum.

Table 2: Contingency and Chi-Square table on Facilities & Curriculum Integration.

ITEM	SA	A	D	SD	ROW TOTAL	df	CAL. X^2	CRITICAL VALUE	DECISION
1	13	12	28	96	149				
2	4	19	42	84	149	6	12.592	11.61	Rejected
3	9	14	28	98	149				
TOTAL	26	45	98	278	447				

α 0.05

Table 2 revealed that, the calculated chi square (X_2) value of 12.592 is greater than the critical value of 11.61 at 0.05 level of significance and degree of freedom (df) of 6. Therefore, the hypothesis was Rejected. Consequent to the rejected hypothesis, availability of sport facilities and other infrastructure for P.E classes in primary schools will have positive influence on integration of P.E in the primary school curriculum.

Table 3: Contingency and Chi-Square table on Funds & Curriculum Integration.

ITEM	SA	A	D	SD	ROW TOTAL	df	CAL. X^2	CRITICAL VALUE	DECISION
1	3	9	49	88	149				
2	5	6	46	92	149	**6**	**12.592**	**4.8**	**Rejected**
3	4	6	36	103	149				
TOTAL	12	21	131	283	447				

α 0.05

Table 3 revealed that, the calculated chi square (X_2) value of 12.592 is greater than the critical value of 4.8 at 0.05 level of significance and degree of freedom (df) of 6. Therefore, the hypothesis was Rejected. Consequent to the Rejected hypothesis, availability of funds will have a positive influence on integration of P.E into the primary school curriculum.

Table 4: Contingency and Chi-Square table on government policy & Curriculum Integration.

ITEM	SA	A	D	SD	ROW TOTAL	df	CAL. X^2	CRITICAL VALUE	DECISION
1	6	12	42	89	149				
2	54	60	24	11	149	6	12.592	224.1	Fail to reject
3	4	5	35	106	149				
TOTAL	64	77	101	205	447				

Table 4 revealed that, the calculated chi square (X_2) value of 12.592 is less than the critical value of 224.1 at 0.05 level of significance and degree of freedom (df) of 6. Therefore, we fail to reject the hypothesis. Consequent to the Accepted hypothesis, dissemination of information on the need for participation in PE by government will have a positive influence on integration of P.E in the primary school curriculum.

Discussion of Findings

The result from tested hypothesis 1 shows that consequent to the Accepted hypothesis, time allotted to P.E in primary schools will have an influence on integration of P.E in the primary school

curriculum. This is in line the view of Ibukun (2004) that more time should be provided for practical work before students are certified as teachers. There is the need to review upward, the twelve weeks of internship for education students in the university. To provide sound teacher education in future, the present curriculum need to be reviewed so as to provide more time for students in the practical aspect of teaching before certificates are awarded to them as qualified teachers. The time allotted for the teaching of Physical Education in primary schools should also be reviewed up. More time should be given for teaching the subject as only then can a meaningful impact be felt.

The result from hypothesis 2 revealed that consequent to the rejected hypothesis, availability of sport facilities and other infrastructure for P.E classes in primary schools will have positive influence on integration of P.E in the primary school curriculum. The above revelation is in support of Ibukun (2004) when he advocated for modern educational gadgets like computers, modern instructional materials, packages as well as other practical facilities to be consciously introduced into the teacher education programme.

The result from hypothesis 3 revealed that consequent to the Rejected hypothesis, availability of funds will have a positive influence on integration of P.E into the primary school curriculum. This finding is further buttressed by Akindutire (2001) that, the poor funding of the teacher education since the 1980s has become a cause of worry to educationists as it affects the merits and standard of the certificates awarded to education graduates. The result is further supported by Aina (2002), Durosaro (2006), Amadi (2007) and Balogun (2010) where they all lamented over the inadequacy of fund in the education sector.

The result from hypothesis 4 shows that consequent to the accepted hypothesis, dissemination of information on the need for participation in PE by government will have a positive influence on integration of P.E in the primary school curriculum. The finding is supported by the submission of Bucher (1979) that various government levels need to introduce Bills and enact laws through legislative arms to protect students and consumers. Also

appropriate information and guidelines should be set forth to assist students and those that engage in ohysical activities.

Conclusion

Based on the findings of this study, the following conclusions were drawn:

1. Time allotted on subject time table to P.E in primary schools will have an influence on integration of P.E in the primary school curriculum.
2. Availability/non availability of sport facilities for P.E practical classes in primary schools will have influence on integration of P.E in the primary school curriculum.
3. Availability/non availability of funds will have influence on integration of P.E into the primary school curriculum.
4. Dissemination of information on the need for participation in PE by the government will have a positive influence on integration of P.E in the primary school curriculum.

Recommendations

Based on the above observations, it is imperative to state that, integration of physical education into primary school curriculum in Nigeria needs to be given close attention by physical education experts and all stakeholders including the government. It is in view of this that, the following recommendations are made:

1. More time should be allotted to teaching PE in primary schools than what is it presently.
2. Adequate and functional sport facilities for P.E practical classes in primary schools should be made available by government and stakeholders.
3. Funds should be made available and such funds must be used only for the purpose intended for facilitating the smooth running of the school, especially regarding the effective teaching of PE.
4. Public enlightenment should be done by government as well as all stake holders on the need for participation in PE by all and sundry, especially with a view to eradicating the

idea that, participating in PE practical classes and sports would promote nudity.

References

Adedeji, J. A. (1985). *Teaching of Physical and Health Education.* (1st Ed). lbadan: Westbooks Publishers Limited

Adedeji, J. A. (2001). *Equality of Opportunity: The Evolution of Democracy in Physical Education and Sports Ibadan: A Valedictory Lecture, University of Ibadan*. Eden Prints.

Aina, O.I. (2002). Alternative modes of financing higher education in Nigeria and the implications for university governance. *Africa Development*, 27(1&2): 236 – 262.

Ajala, J. A., Amusa, L. O. & Sohi, S. A. (2002). Physical Education. Lagos: Macmillan Publishers.

Ajayi, I.A. (2004). Social science method. Ado-Ekiti: Green Line Publishers.

Akindutire, I.O. (2001). The teaching profession. Lagos: Universal Publishers.

Alaezi, O. (1989). The Nigerian new school curriculum: Issues and insights. Jos: Ehindeyo (Nig) Ltd.

Amadi, M.N. (2007). Funding initiatives in higher education. in J. B. Babalola, G. O. Akpa, A. O. Ayeni, S. O. Adedeji (Eds) *Access, Equity and Quality in Higher Education*. NAEAP Publications. 543-554.

Babalola, V. O. (2004). Resources materials in the implementation of curriculum in the 21st century in A. O. K.Noah, D. O. Shonibare, A. A. Ojo & T. Olujuwon, (Eds); Curriculum implementation and professionalizing teaching in Nigeria. Lagos: Central Education Services

Balogun, A.M. (2010). *Challenges of higher education in Nigeria*: *A manager's perspective*. Being a paper presented at the maiden edition of the Faculty of Education Annual Lecture Series, University of Ado-Ekiti, March 22nd.

Bobade, M.O. (2003). Research Methodology; Fundamental Approach. Revised Ed. Ibadan: Waleswealth.

Bucher, C. A. (1979). Foundations of Physical Education. (8th Ed.). The CV Mosby Company. London.

Durosaro, D.O. (2006). Teacher education in Nigeria: Past, present and future challenges. The Pacesetter: *J. Oyo State College Educ*. 13 (1): 44-54.

Edim, M. E., Emeribe, V. C. & Akah, L. U. (2010). The place of adapted physical education in special education curriculum, in T. Ajobiewe & P. I. Osuorji (Eds). New perspectives in special needs education for sustainment development. Ibadan: Glory-Land Publishing Company.

Federal Ministry of Education (1981): National Policy on Education. Lagos: Federal Government Press.

Federal Ministry of Education (2004): National and Policy on Education (4th Ed). Lagos: Federal Government Press.

Federal Republic of Nigeria (2004). *National Policy of Education*. Lagos: National Educ. Res. Dev. Council.

Federal Republic of Nigeria (2005). Federal Republic of Nigeria in Collaboration with International Labour Organization (ILO) action programme as education 2004-2005*: Teachers for the future: meeting teacher shortages to achieve education for all. Nigeria*: National Policy Brief.

Garba, M. (2004). The critical role of education resource of curriculum implementation in A. O. K. Noah, D. O.Shorribare, A. A. Ojo, & T. Olujuwon, (Eds); Curriculum implementation and professionalizing teaching in Nigeria. Lagos: Central Education Services.

Halbert ,J., & MacPhail, A.(2005). Physical Education in Ireland. In: Puhse U, Gerber M, editors. International Comparison of Physical Education. Concept - Problems - Prospects: Aachen: Meyer & Meyer Verlag; 2005. p. 380-399.

Henderson, S. B., (1996). Physical Education and Sports: An occupational Perspective (9th ed.). London: C.V. Mosby Company.

DIFFERENCES IN BODY ANTHROPOMETRY BETWEEN COMPETITIVELY EFFICIENT AND LESS EFFICIENT JUNIOR MALE HANDBALL PLAYERS

Adodo, S. M. & Agwubike, E. O
Institute of Education
University of Benin
Benin City, Nigeria
e-mail: samado2g4@gmail.com, samuel.adodo@uniben.edu

Department of Human Kinetics and Sports Science
University of Benin
Benin City, Nigeria
e-mail: ellydike70@gmail.com

Abstract

This study was carried out to determine if differences existed in anthropometric and body composition characteristics between competitively efficient (above average) and less efficient (average) junior male handball players. A total of 106 junior male handball players participated in this study. The players were divided into two playing quality or performance groups of above average or (competitively efficient) (n = 26) and average or competitively less efficient (n = 80) levels. A combination of individual players' quality as determined subjectively by a consortium of national handball coaches and team ranking achieved at a championship were used to achieve this purpose. 22 anthropometric attributes were measured for each subject. Similarly, 6 body composition variables were estimated. The results showed that the above average players were better endowed morphologically than the average players particularly in the Longitudinal Skeleton Dimensionality (LSD), Transverse Skeleton Dimensionality (TSD) and Absolute Voluminosity of the Body (AVB) dimensions. The junior male players at both levels of performance were relatively homogenous in the Subcutaneous Fatty Tissue (SFT). However, the

EVALUATION OF MUSCULOSKELETAL FITNESS AND ITS RELATIONSHIP TO QUALITY OF LIFE OF UNIVERSITY ACADEMIC STAFF IN NIGERIA

Michael, G. & Oladipo, I.O. (Ph.D)
Department of Human Kinetics and Health Education
University of Ibadan, Ibadan, Nigeria

ABSTRACT

This study was carried out to evaluate the musculoskeletal fitness and its relationship to quality of life of university academic staff in Nigeria. Teaching staff served as the target population. Forty academic staff volunteered and registered for the study in University of Ibadan but the total number of participants that completed the study was thirty six (36). Quasi-experimental research design was used for the study. The data collected were subjected to statistical analysis using descriptive statistics of mean and standard deviation and inferential statistics of pairwise t-test and Pearson Product Moment Correlation to test the hypotheses at 0.05 level of significance. The mean score of physical health quality of life of the participants showed that the participants rated themselves as having good quality of life. However, the t-test values show that the participants' do not possess adequate musculoskeletal fitness required to carry out their activities of daily living (ADLs). The correlational r values of musculoskeletal components are .074, .029, .126 and .059 which are lower than the critical value of .4683. The implication of this is that the assumption made that the participants possess good quality of life is not supported by the results of their musculoskeletal tests. The findings indicated that no significant relationship exist between

participants' musculoskeletal status and their quality of life. Based on the findings, it was concluded that exercise programme should be put forth to enhance musculoskeletal fitness and improve the quality of life of academic staff in the Universities.

Keywords: Musculoskeletal-fitness, quality of life, academic staff

Introduction

Bones, cartilages, muscles, joints, tendons and ligaments in a person's body compose what is known as the musculoskeletal system. The bones provide the body with a framework, giving it shape and support; they also serve as protection for internal organs such as the lungs and liver. Muscles are fibers that help to make deliberate movement of a body part or involuntary movement within an internal organ possible. Some people view this system as two separate systems that work very closely together, with one being the muscular system and the other being the skeletal system.

High levels of musculoskeletal fitness can enhance one's capacity to meet the demands of everyday life thereby allowing an individual to maintain functional independence for a greater period of time. Musculoskeletal fitness promotes and maintains overall health and athletic performance. It is associated with numerous health benefits, including a reduced risk of coronary heart disease, osteoporosis, glucose intolerance and musculoskeletal injuries. An increase in musculoskeletal fitness, in terms of athletic performance, leads to improved agility and enhanced athletic ability. Musculoskeletal fitness is part of everyday life; walking, lifting things, attending to daily tasks and playing sports are examples of how musculoskeletal fitness is needed to carry out activities of daily living without undue fatigue.

According to Kell, Bell & Quinney (2001) a healthy musculoskeletal system is also associated with improved ability to complete activities of daily living and is directly related to quality of life. Ultimately, high levels of musculoskeletal fitness are associated with positive health status, whereas lower levels of musculoskeletal fitness are associated with lower health status (Warburton, Gledhill & Quinney (2001). The longer a person is able to maintain musculoskeletal fitness, the longer the person will remain an independent person in the society to old age.

Quality of life (QOL), in general is the perceived quality of an individual's daily life, that is, an assessment of their well-being or lack thereof. These include all emotional, social and physical aspects of the individual's life. In health care, health-related

quality of life (HRQOL) is an assessment of how the individual's well-being may be affected over time by a disease, disability or disorder.

Quality of life is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. Quality of life encompasses the physiological, psychological, emotional and spiritual well-being of an individual (Warburton, Gledhill, & Quinney, 2001). An assessment of the effect of high levels of musculoskeletal fitness on indicators of QOL is important because of the impact of QOL in the prevention of chronic disease and delivery of daily tasks without undue fatigue (Hennessy, Moriarty, Zack, Scherr & Brackbill, 1994). Quality of life on the individual level include physical and mental health perceptions and their correlates including health risks and conditions, functional status, social support, and economic status. However this study addressed just the physiological and functional status of university academic staff of University of Ibadan, Ibadan, Nigeria.

Functional status refers to the ability to carry out the activities of daily living (ADLs). Enstrud et al., (1994) are of the opinion that as functional capacity decreases, disability and the need for institutionalization or hospitalization increases, along with the rate of premature mortality. High levels of musculoskeletal fitness enhance one's capacity to meet the demands of everyday life thereby allowing an individual to maintain functional independence for a greater period of time. With the aging population, improved functional status will increasingly become a greater concern for the university academic staff especially with academic staff retirement age in Nigeria that has been fixed at seventy years. Many elderly persons currently live near or below the functional threshold of musculoskeletal fitness for daily living.

Warburton, et al (2001) opined that musculoskeletal system has four elements; which are muscular strength, endurance, power and flexibility. Muscular strength is the maximal one-effort force that can be exerted against a resistance. Certain level of strength is needed, without which it would be impossible to carry out many of

the simple everyday tasks such as lifting objects or even maintaining an upright posture. Strength training has been shown to offset the loss in muscle strength and mass (sarcopenia) associated with aging, which may increase the ability to perform ADLs and improve bone health (Warburton, et al., 2001) Also, high levels of muscular strength allow an individual to engage in more recreational activities, which will help to off-set sarcopenia and disuse-related diseases. Therefore, achieving high levels of muscular strength is an effective means of maintaining functional status.

Muscular endurance is the ability of the muscles to apply a sub-maximal force repeatedly or to sustain a muscular contraction for a certain period of time. From a QOL point of view, it is important for an individual to carry objects and perform repeated contractions for extended periods of time without fatiguing. According to Canadian Society for Exercise Physiology (1996) many tasks of everyday living require good muscular endurance. Salem, Wang, Young, Marion and Greendale (2000) also reported that muscular endurance was directly associated with several functional outcomes.

Muscular power is known as the explosiveness of a muscle. It involves a combination of muscular strength and speed. Although, muscular power is thought to be more important for optimal sport performance than personal health status, many ADLs require the capacity to apply a force quickly, thus, muscular power is associated with functional capacity and the potential to perform ADLs.

Flexibility according to Kell, et al., 2001) has two components, dynamic and static, where dynamic flexibility is the opposition or resistance of a joint to motion (the forces opposing movement rather than the range of movement itself). Static flexibility is the range of motion permissible about a joint. Flexibility is an indicator of health status; an improvement in flexibility is thought to result in a decreased incidence of injuries and an increased performance during physical activities. A reduced flexibility has been associated with decreased functional abilities,

including a lowered walking velocity and increased difficulty climbing stairs and getting up from a chair (Escalante, Lichtenstein, Dhanda, Cornell & Hazuda, 1999). Reduced flexibility has also been associated with a reduction in health status, including increased self-reported pain and a reduction in perceived health, physical function, social function, mental health, and overall QOL (Payne, Gledhill, Katzarmzyk, Jamnik & Ferguson, 2000).

According to Erick and Smith (2013) musculoskeletal diseases represents a common occupational problem in the teaching profession in Australia and teachers represent an occupational group among which there appears to be a high prevalence of MSD. The work of a teacher especially in the university, does not only involve teaching students but also preparing lessons, assessing students' work, research, community service and also being involved in extracurricular activities such as sports, field work, trips and project supervision. Teachers are essential for the effective functioning of the educational system and for improving the quality of learning processes.

The work of teachers often involves significant use of a 'head down' posture, such as frequent reading, marking of assignments, and prolonged sitting or standing; all these have significant effects on their musculoskeletal system. This study therefore aimed at looking into individual, physical and physiological variables and how it affects the quality of life of university academic staff.

Research Hypotheses

The following hypotheses were tested in this study:

1. University Academic staff in University of Ibadan, Nigeria will not significantly possess adequate musculoskeletal fitness (muscular strength, muscular endurance, power, and flexibility).
2. There will be no significant relationship between musculoskeletal fitness and physical health quality of life of academic staff in University of Ibadan.

Research design

The design for this study was quasi-experimental research design. The design enabled the establishment of cause-effect relationships between musculoskeletal fitness and quality of life of university academic staff. This design was chosen because the researcher has no control over the variables of interest and therefore cannot manipulate them.

Sample and Sampling Techniques

Forty academic staff volunteered for the study, however only thirty-six completed it. University of Ibadan was purposively selected being the first university in Nigeria with large population of academic staff. The University has seventeen (17) faculties and five were randomly selected. Through the use of banners and social media, forty volunteers were recruited. Those that took part in the assessment were mainly male academic staff.

Instruments and Data collection Procedure

The following research tests and instruments were used in the course of this study:

Grip Strength Dynamometer T.K.K. 5401 Grip – D, manufactured by Takie Scientific Instruments Co. LTD, Japan and calibrated from 0 – 100kg was used for arm strength test. Hana portable weight measuring scale (RA 9012) made in England was used to measure the total body weight of the participants in kilogram (kg). Stadiometer was used to measure participants' height to the nearest 0.5 centimeter. Static Vertical Jump was used to measure participants' leg power. A calibrated sit-and-reach box was used for measuring trunk and hamstring flexibility of the participants. The track star jewels digit stopwatch made in Switzerland was used in timing the participants. A 50 meter length measuring tape was used for taking measurements where necessary. Sit-up test was used to test for abdominal strength. Sit-and-reach test was used for flexibility test. While the World Health Organisation Quality of Life Questionnaire (WHOQoL) (2012) was used to elicit information about the quality of life of participants as related to their daily living.

Test location

All the tests and measurements were done at the Human Performance Laboratory of the Department of Human Kinetics and Health Education, University of Ibadan, Ibadan, Nigeria.

Results and Discussion

The participants demographic data revealed that although the retirement age of University academic staff in Nigeria has recently elongated to 70 years only 22.2% of the participants have their age close to retirement. However none is below age 40.

The three age ranges of the participants indicated that those between 40 – 49years were 12 (33.3%), for 50 – 59years they were 16 (44.4%) and for 60 – 69years they were 8 (22.2%).

The length of employment of the participants falls within range 5-10years 12 (33.3%), 11–15years were 12 (33.3%), 16–20years were 6 (16.7%), 21–25years 2 (12.5%), 26–30years 2 (12.5%) and 30years and above has 2 (12.5%).

Table1: Mean and standard deviation values for musculoskeletal components n = 36

Variables	Mean	Standard deviation
Combined arm strength (kg)	58.58	20.89
Abdominal endurance (sit-up)	17.33	6.83
Leg power (cm)	27.94	5.99
Flexibility (cm)	1.34	10.20

Table 1 shows the mean and standard deviation values for musculoskeletal components. The value for combined arm strength for all the participants was 58.58$\pm$ 20.89, while 17.33 $\pm$ 6.83 was the value for abdominal endurance. The values for leg power and flexibility were 27.94 $\pm$ 5.99 and 1.34 $\pm$ 10.20 respectively.

Hypotheses Testing

Ho 1: Male Academic staff of Nigeria Universities will not significantly possess adequate musculoskeletal fitness (muscular strength, endurance, power and flexibility) required for their activities of daily living.

Table 2: Comparative analysis of participants musculoskeletal fitness with standardized norm

Variables	N	Mean	Std. Dev.	Crit-t	Cal-t.	DF	P
Participants' Arm strength	36	60.97	21.3				
				2.0	-5.60	35	.000
Arm strength norm		89.33	2.2				
Abdominal Endurance	36	18.0	6.66				
				2.0	-	35	.000
Abdominal Endurance Norm		34.83	4.52		10.48		
Leg power	36	28.94	4.65				
				2.0	-3.65	35	.002
Leg power Norm		32.83	1.51				
Leg power	16	1.26	10.25				
				2.0	-7.86	17	.000
Standardized Leg power	16	21.33	1.28				

When the mean value for the participants' arm strength of 60.97 $\pm$ 21.3 was compared with the expected norm value of 89.33 $\pm$ 2.2 it shows that there is a significant difference between the combined arm strength of male participants with the standardized norm. The cal. t value of -5.59 is greater than the Critical value of 2.0 at df of 17. Likewise the calculated P of .000 is less than 0.05 level of significance. This result therefore, shows that the

participants does not possess adequate arm strength required for their activities of daily living.

Table 2 still shows that there is a significant difference between the participants' abdominal endurance and standardized abdominal endurance. The cal. t value of -10.48 is greater than the critical-t value of 2.0 at df of 17. In the same manner the cal. p of 0.000 is less than 0.05 level of significance. This result therefore, shows that the participants possess inadequate abdominal endurance required for their day-to-day activities.

Table 2 further the mean value for the male participants' leg power to be 28.94 $\pm$ 4.65 while the expected norm value is 32.83 $\pm$1.51, this shows that there is a significant difference between the leg power of male participants with the standardized norm. The cal. t value of -3.65 is greater than the Critical value of 2.0 at df of 17. Likewise the calculated p of 0.002 is less than 0.05 level of significance. This result therefore, shows that the participants does not possess adequate leg power required for their activities of daily living.

The mean and standard deviation values for the male participants' flexibility to be 1.26 $\pm$ 10.25 and the norm value of 21.33 $\pm$ 1.28 which shows that there is a significant difference between the flexibility of male participants with the standardized norm. The cal.t value of -7.86 which is higher than the critical t value of 2.0, further confirms the significant difference. The cal. p value of 0.000 is less than 0.05 level of significance. This result shows that male academic staff do not possesses adequate flexibility required for their activities of daily living.

Ho 2: There will be no significant relationship between musculoskeletal fitness and quality of life of academic staff in the University of Ibadan.

Table 3: Relationship between musculoskeletal fitness and participants' Quality of Life

Variables	N	Mean	Std. Dev.	PPMC (r)	P	Remark
Quality of Life	36	21.83	2.26			
				.074	.770	Not Sig.
Arm strength	36	104.37	22.74			
Quality of Life	36	21.83	2.26			Not Sig.
				.029	.909	
Abdominal Endurance	36	32.00	6.27			
Quality of Life	36	21.83	2.26			Not Sig.
				.126	.619	
Leg power	36	45.94	4.94			
Quality of Life	36	21.83	2.26			Not Sig.
				.059	.815	
Flexibility	36	6.76	11.42			

The results above show that there was no significant relationship between participants' musculoskeletal fitness and their physical health quality of life. The correlation value between quality of life and arm strength is r = 0.074 while the crit value is 0.4683. Likewise, the cal. P value of 0.770 is higher than 0.05. Therefore, there is no significant relationship between arm strength and quality of life of the participants. The abdominal endurance shows a correlation value of r = 0.029 which is lesser compared to the table value of 0.4683 and the cal. P value of 0.909 is higher than 0.05 level of significance. The leg power has a correlation value of r = 0.126 which is lesser than the table value of 0.4683 and the cal. P value of 0.619 is higher than the significant level of 0.05. Likewise, flexibility correlation value of r = 0.059 is lesser than the table value of 0.4683. Also, the cal. P of 0.815 is higher than 0.05. Therefore, none of the four variables joined together is significantly correlated with the quality of life. The ruling is therefore that the null hypothesis is accepted.

The result of the study on participants arm strength as presented in table 2 showed that there was significant difference between the participants' arm strength when compared with the standardized norm. For the participants, their arm strength was 60.97 $\pm$ 21.3 while the standard was 89.33 $\pm$ 2.2. This implies that the participants do not possess adequate arm strength required for their activities of daily living (ADLs). This may be due to the effect of age, because all the participants were within the age range of 40 – 69 years, this corroborates Hurley (1995) that says muscular strength reaches its peak value at age 20–30 years then declines at approximately 45 – 50 years. Likewise, Jette, Branch and Berlin (1990), reported that a reduction in hand function is a significant contribution to the impairment in performing basic activities of daily living. Giampaoli et al. (1999), also revealed that arm strength is an independent predictor of impaired function relating to capacity to perform activities of daily living.

The result as shown on table 2 indicated that there was a significant difference in the participants' abdominal endurance values of 18 $\pm$ 666 when compared to the standard norm. The obtained t-value of -10.48 was higher than the critical value of 2.0 at df 17. The probability of 0.000 was lesser than 0.05. The result implies that the participants do not possess adequate abdominal endurance required for their activities of daily living. Suni and Colleagues (1998) reported that trunk muscular endurance was a strong predictor of mobility and perceived health, respectively, in men and women. Salem et al., (2000) also reported that muscular endurance was directly associated with several functional outcomes.

The participants' leg power result presented on table 2 revealed that there was significant difference in the mean and standard deviation value of 28.94 $\pm$ 4.65 when compared with the expected norm of 32.83 $\pm$ 1.51. The obtained t-value of -3.65 was higher than the critical t-value of 2.0 at df 17. The probability of 0.002 was lesser than 0.05. This implied that the participants of this study do not possess adequate leg power.

As reported under the result of the participants' flexibility shown on table 2, the mean value of 1.26 $\pm$ 10.25 was lower than the standard norm values of 21.3 $\pm$ 1.28 which shows that there was significant difference between the flexibility of the participants with the standardized norm (Crit-t = 2.0, Cal.t = -7.86 and df = 17, $P < 0.05$). This implied that the participants do not possess adequate flexibility required for their activities of daily living.

The correlational result between musculoskeletal fitness and physical health quality of life of academic staff in University of Ibadan presented on table 3 showed the following results:

The Pearson Product Moment Correlation (PPMC) value of 0.074 that was obtained when arm strength was compared with physical health quality of life of participants, it shows no significant relationship. Likewise, the cal. p of 0.770 is higher than 0.05 level of significance, therefore the null hypothesis was not rejected. However, this result just attempt to determine the reason and not the effect of the relationship, neither does it shows that there is no relationship at all, but the value of r = 0.074 is very low compared with 0.4683. In addition, when these values were transformed on the WHOQoL (2012) domains, there is an indication that where there is low value of arm strength (39.7kg) the quality of life rating (17) is also low and where the arm strength has higher mean value (65kg) the quality of life also has high rate value (25). This is in line with the findings of Warburton et al (2001), that high levels of muscular strength are to be accompanied with a greater capacity to perform basic activities of daily living.

The abdominal endurance correlational value of 0.029 that was obtained when compared with physical health quality of life of participants shows that no significant relationship. The cal. p of 0.909 is high, since the probability is > 0.05. However, this result attempted to see if abdominal endurance is a factor to physical health quality of life of the participants. Therefore, the value of r = 0.029 is very low compared with 0.4683. In addition, the transformed score indicated that where there is low value of abdominal endurance (15) there is low quality of life rating (20)

and where the abdominal endurance is high (21) the quality of life also has high rate value (26). This is in alignment with Suni and Colleagues (1998) report that trunk muscular endurance is a strong predictor of mobility and perceived health. Salem et al., (2000) also reported that muscular endurance is directly associated with several functional outcomes.

The findings of this study revealed that there is no significant relationship between the participants' leg power correlational value and their physical health quality of life as presented on table 3. Which shows correlation r = 0.126 with calculated p of 0.619. This result does not indicate effect relationship between participants' leg power and quality of life, neither is there an indication that there is no relationship at all, but with the value of r = 0.126 which is very low compared with 0.4683 indicated that leg power is a factor to the physical health quality of life of the participants. Since on the WHOQoL (2012) domain table where there is low value of leg power (23cm) there is low quality of life rating (17) but when the leg power is high (32cm), the quality of life has high rate value (26), this result corroborates the findings of Bassey et al., (1992) that loses in muscular power is associated with a decrease in functional ability.

The correlational value of 0.059 was obtained when compared participants' flexibility with their physical health quality of life. This results show that there is no significant relationship with cal. p of 0.815 and r value of 0.059.

Furthermore, the domain table reflected that where there is low value of flexibility (-7cm) there is low quality of life rating (17) and when the flexibility value is high (9.2cm) the quality of life has high rating value (22). Warburton, Gledhill and Quinney (2001), reported that the relationship between flexibility and health status are specifically related to the impact of ageing on flexibility associated changes in functional status.

Worthy of note is that the participants poor flexibility (1.34 $\pm$ 10.20) may be attributed to their age, sex and body fat. According to Hockey (1996), these three are among the factors that affects flexibility. The participants' age range in this study is

between 40–69years, while majority of the participants' BMI is above the normal baseline (18.5 – 24.9) in the norm table classification (National Heart, Lung and Blood Institute, 1998). Likewise females have been reported to be more flexible than males.

Conclusion

The following conclusions and interpretations were made based on the findings of this study:

The University academic staff that took part in this study does not possesses adequate arm strength, abdominal endurance, leg power and have poor flexibility. Though, they rated themselves to possess average physical health quality of life. This claim could not be confirmed nor ascertained by their low qualities on the tested variables. This study therefore recommend regular periodic health examination of lecturers in order to be sure that they are fit for their job and prevent untimely death. This set of people needs to be encouraged to take active part in regular exercise programme and physical recreational activities as they claimed they are too busy to have time for such activities.

References

Canadian Society for Exercise Physiology 1996. Canadian Physical Activity, Fitness and Lifestyle Appraisal Manual. Ottawa, ON: Canadian Society for Exercise Physiology.

Ensrud, K.E., Nevitt, M.C., Yunis, C., Cauley, J.A., Seeley, D.G., Fox, K.M.and Cummings, S.R. 1994. Correlates of impaired function in older women. *J. Am. Geriatr. Soc.* 42: 481-489.

Erick, P. And Smith, D. 2013. Musculoskeletal disorder risk factors in teaching profession: a critical review OA Musculoskeletal Medicine. Dec. 01:1(3): 29.

Escalante, A., Lichtenstein, M.J., Dhanda, R., Cornell, J.E. and Hazuda, H.P. 1999. Determinants of hip and knee flexion range: Results from the San Antonio Longitudinal Study of Aging. *Arthritis Care Res.* 12: 8-18.

Giampaoli, S., Ferrucci, L., Cecchi, F., Lo Noce, C., Poce, A., Dima, F., Santaquilani, A., Vescio, M.F. and Menotti, a. 1999. Hand-grip Strength predicts incident disability in non-disabled older men. Age Ageing 28: 283-288.

Hennessy, C.H., Moriarty, D.G., Zack, M.M., Scherr, P.A. and Brackbill, R. 1994. Measuring health-related quality of life for public health surveillance. *Public Health Rep*. 109:665-672.

Hockey, R.V. 1996. Physical Fitness: The Pathway to Healthy Living. 8th ed. USA. McGraw-Hill.

Hurley, V.F. 1995. Age, gender and muscular strength. *J. Gerontol. A Biol. Sci Med. Sci*. 50 (Spec No): 41-44.

Jette, A.M., Branch, L.G. and Berlin, J. 1990. Musculoskeletal impairments and physical disablement among the aged. *J. Gerontol*. 45: M203-M208.

Kell, R.T., Bell, G. And Quinney, A. 2001. Musculoskeletal fitness, Health Outcomes and Quality of Life. *Sports Med* 312: 863-873.

National Heart, Lung and Blood Institute, 1998. Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adult; the evidence report Bethesda, MD: National Institute of Health.

Payne, N., Gledhill, N., Katzarmzyk, P., Jamnik, V. And Ferguson, S. 2000. Health implications of musculoskeletal fitness. *Can. J. Appl. Physiol.* 25:114-126.

Salem, G.J., Wang, M.Y., Young, J.T., Marion, M. and Greendale, G.A. 2000. Knee strength and lower and higher-intensity functional performance in older adults. Med. Sci. Sports Exerc. 32: 1679-1684

Suni, J.H., Oja, P., Miilunpalo, S.I., Pasanen, M.E., Vuori, I.M. and Bos, K. 1998. Health-related fitness test battery for adults: Associations with perceived health, mobility and back function and symptoms. *Arch. Phys. Med. Rehabil*. 79: 559-569.

Warburton, D.E.R., Gledhill, N. And Quinney, A. 2001. Musculoskeletal fitness and health. *Can. J. Appl. Physiol*. 26: 217-237.

World Health Organization 2005. The World health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. SocSci Med 2005; 41(10):1403-1409.

PEDAGOGICAL CONTENT KNOWLEDGE OF PRE-SERVICE TEACHERS' IN PHYSICAL EDUCATION: A CASE STUDY OF KOMENDA COLLEGE OF EDUCATION

1Ogum, N. Prosper*, 2Ocansey, T. Reginald, 3Mintah, K. Joseph, & 4Ogum, A. Mary

1&3Department of Health, Physical Education and Recreation, University of Cape Coast, Ghana

2Department of Physical Education and Sports Studies, University of Ghana, Legon, Accra, Ghana

4University Practice Senior High School, Cape Coast, Ghana

E-mail: pogum@ucc.edu.gh; Tel. +233-243-514-178

Abstract

The study assessed the pedagogical content knowledge of pre-service teachers in Physical Education at the Colleges of Education in Ghana. The descriptive survey design was employed to conduct the study. One hundred and eighty (180) final year students were randomly selected for the study. A questionnaire was used to collect the data for the study. Data were analyzed using frequencies and percentages. The results indicated that pre-service teachers at the colleges received sufficient instructions in physical education about the subject matter and general pedagogical practices to enable them teach the content of instruction effectively to enhance positive learning outcomes in their students. Also, pre-service teachers acquired adequate knowledge about their learners and their characteristics to make them effective teachers in Physical Education. Thus, the teacher education division must keep to, monitor and supervise the present syllabus being used by

the Colleges of Education since the pre-service teachers in this study have proved that they received sufficient instructions to make them effective teachers in Physical Education.

Key words: Pedagogical content knowledge, characteristics of the context of learning, colleges of education, pre-service teachers

Introduction

The beginning of formal education in Ghana can be traced to the coming of the Europeans. The introduction of Castle Schools and Mission Schools gave Ghana the needed foundation for the current educational system. Education at the time of the Castle Schools focused mainly on the 3Rs (Reading, Writing and Arithmetic). Physical education as a school subject at that time received no attention. It was during the time of Sir Gordon Guggisberg, the then Governor of the Gold Coast, that the sixteen principles of education were introduced. The 9th principle states that every school should have a field of play for physical education, recreation and sports. This principle also emphasized that; every child of school going age should be admitted and allowed to play sports (McWilliams, & Kwamena-Poh, 1978). The introduction of the Accelerated Development Plan for Education in 1951 also made the teaching of Physical Education a policy in the country (McWilliams, & Kwamena-Poh, 1978).

Physical Education concerns the teaching of motor skills and movement patterns needed to perform a variety of physical activities planned and directed by schools to achieve and maintain a healthy enhancing level of physical fitness (Ghana Physical Education and Sports Thinktank [GPESTt], 2009). Thus, by the time a student graduates from school, the student should be able to participate regularly in physical activity. Put differently, the student should be able to demonstrate, practice and persist in physically active lifestyle. This is because physical education guided by learning standards, provides opportunities for students to choose to be physically active and to value physical activity. Fostering a physically active lifestyle in students must be recognized as an ultimate goal of physical education.

The teaching of Physical Education enables the individual to develop interest and motivation to use motor skills and movement patterns in ways to enhance a physically active lifestyle. This implies that pre-service teachers of Physical Education need to possess proper and adequate pedagogical content knowledge (PCK) to be able to teach the subject matter knowledge effectively. Pedagogical content knowledge has therefore been embraced by

many of the educational reforms in the world as a way of describing the knowledge possessed by expert teachers (Shulman, 1986). It is that form of knowledge that makes teachers to be teachers rather than subject area experts (Shulman, 1986). It also refers to teachers' knowledge about the basic teaching or learning matters such as learning theories, teaching approaches, curriculum designs, evaluation techniques, and relevant managerial issues (Albalawi, & Badawi, 2008).

Furthermore, PCK has also been viewed as a set of special attributes that help teachers to transfer the knowledge of content to others (Geddis, 1993). Additionally, PCK is a type of knowledge that is unique to teachers, and in fact is what teaching is about. It concerns the manner in which teachers relate their pedagogical knowledge (what they know about teaching) to their subject matter knowledge (what they know about what they teach), in the school context, for the teaching of specific students. It is the integration or the synthesis of teachers' pedagogical knowledge and their subject matter knowledge that comprises PCK.

Over the past years, the major focus in pedagogical research has been in the area of teacher effectiveness (Geddis, 1993). Many of the studies have dealt with the improvement of teaching skills and/or the effect of teacher or student behaviours on student achievement. However, basic school children need quality and effective tuition in Physical Education in order to nurture adherence habits for physical activity. In fact, Colleges of Education can contribute immensely to the physical activity needs of children if basic school pre-service teachers are given the chance to acquire knowledge, skills, and attitudes needed for quality basic school Physical Education teaching (Ghana Physical Education, & Sports Thinktank [GPESTt], 2009).

Pre-service teachers from Colleges of Education represent a frontline in the development of skills and attitudes that enable children and adolescents to engage in regular physical activity. The education of the youth to regularly participate in physical activity in the future starts with teachers in the lower basic school level. Colleges of Education are strategically positioned to provide the foundation of knowledge, skills, and learning experiences that pre-

service teachers need to promote active living in learners in basic schools (GPESTt, 2009).

Studies conducted so far on teacher effectiveness have revealed that if pre-service teachers receive proper and adequate curricula offerings in teacher preparation in Physical Education, they will be able to provide fundamentally and developmentally appropriate experiences for students to learn in order to develop adherence to physical activity (Ball, & McDiarmid, 1990). Contrarily, a report by GPESTt (2009) has revealed that Physical Education is woefully taught at the basic school level in the country. According to the GPESTt , it is difficult to point at any worthy subject matter knowledge and pedagogical knowledge that teachers acquire at training which will enable them teach the subject effectively so that they can in turn impact the lives of learners in basic schools in a positive way. What then is going on at the colleges of education with regards to curricula offerings in teacher preparation in physical education? It is based upon the afore- mentioned that this study sought to provide in-depth appraisal of teacher knowledge on i) subject matter, ii) pedagogy, and the iii) characteristics of context of learning in Physical Education at the Colleges of Education in Ghana.

Method

The descriptive survey design was used to assess pre-service teachers' PCK in Physical Education at the Colleges of Education in Ghana. The population for the study comprised all the 266 final year students of Komenda College of Education who were on the field having their teaching practice. The reason for selecting the final year students was that they were out of campus doing the "Out" component of their In-In-Out programme and could therefore relate theoretical knowledge to practical knowledge. One hundred and eighty final year students were randomly selected for the study. They were assured of anonymity and confidentiality of their responses. A questionnaire developed by the researchers was used to elicit responses from the respondents. This consisted of 15 closed ended items on a four point Likert scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD) which yielded an alpha reliability coefficient of .67. Frequencies and

percentages were used to report on the current status of pre-service teachers' pedagogical content knowledge in physical education at the Colleges of Education in Ghana.

Results

Results from table 1 indicate that 97% (174) of the participants either agreed or strongly agreed that they received adequate subject matter at training while 83% (150) believed their knowledge was influenced by field experiences. Similarly, 85% (153) of the participants either agreed or strongly agreed that their confidence in teaching physical education was boosted by the amount of knowledge they received at training while 73% (132) agreed or strongly agreed that their teaching style was influenced by the way they have learnt the content at training. Again, 64% (116) of the participants either agreed or strongly agreed that they did not use trial and error strategies in teaching the content of instruction to students since they knew the content and what strategies to use to teach every aspect of the content.

Table 1: Scope of Subject Matter Knowledge of Pre-Service Teachers in Physical Education

Statement	SA f %	A f %	D f %	SD f %
1. I received at training adequate subject matter knowledge and this affects my processes of instruction	88 48.8	86 47.8	1 0.6	5 2.8
2. My knowledge seems to be influenced by field experiences	56 31.1	94 52.2	20 11.1	10 5.6
3. The amount of knowledge I received during training boosted my confidence in teaching practical physical education	80 44.4	73 40.6	21 11.7	6 3.3
4. The way I teach the content of physical education is not	24 13.1	40 22.2	86 47.8	30 16.7

influenced by the way I have learnt it				
5. I use trial and error strategies when delivering the content to students	19 10.6	34 18.9	75 41.7	52 28.9

Table 2 also shows that 91% (164) of the participants either agreed or strongly agreed that they learnt at training how to use demonstrations, simulations and questioning strategies to explain concepts to learners while 62% (112) either agreed or strongly agreed that they acquired at training a wide range of teaching and learning styles to enable them create a healthy learning environment when teaching. Also, 89% (160) either agreed or strongly agreed that they learnt their classroom management practices through field experiences, field observations and students' teaching while 73% (132) either agreed or strongly agreed that they were aware of individual student skill differences when teaching motor content. Furthermore, 64% (116) of the participants either agreed or strongly agreed that they used peer coaching in their teaching because they are aware of it.

Table 2: Scope of Pedagogy Knowledge of Pre-Service Teachers in Physical Education

	SA		A		D		SD	
	f	%	f	%	f	%	f	%
1. I learnt how to use demonstrations, simulation and questioning strategies to explain a concept to learners at training	79	43.3	85	47.2	11	6.1	5	2.8
2. I did not acquire at training how to display a wide range of teaching and learning styles that lead to creating a healthy								

learning environment	28	15.6	40	22.2	74	41.1	38	21.1
3. I learnt my classroom managementpractices through experiences, field observations and students teaching	79	43.8	81	45.0	10	5.6	10	5.6
4. I am not aware of individual student skill differences when teaching motor content	13	7.2	35	19.4	89	49.4	43	24
5. I do not use peer coaching in my teaching because I am not aware of peer coaching functions and techniques	28	15.6	36	20	87	48	29	16.1

Table 3 shows that 88% (159) of the participants either agreed or strongly agreed that good teaching is highly related to one's content knowledge and the ability to convey that knowledge to others while 60% (92) either agreed or strongly agreed that they have a limited knowledge of their students' culture and religion. Also, 55% (99) of the participants either agreed or strongly agreed that their perception played a pivotal role in the way they acquired knowledge during training while 65% (117) either agreed or strongly agreed that their thoughts, interpretation and use of information is influenced by their prior experiences. Again, 71% (128) of the participants either agreed or strongly agreed that their understanding and interpretation of students' emotions affect their selection of content and methods of teaching to facilitate students learning.

Table 3: Characteristics of the Context of Learning in Physical Education

	SA		A		D		SD	
	f	%	f	%	f	%	f	%
1. I believe that good teaching is highly related to one's content knowledge and ability to convey that knowledge to others	100	55.6	59	32.7	10	6.1	11	5.6
2. I have a limited knowledge of my students' culture and religion	15	8.3	77	42.9	62	34.4	26	14.4
3. My perceptions did not play a pivotal role in the way I acquired knowledge during training	23	12.2	59	32.8	78	43.3	21	11.7
4. The way I think, interpret and make use of new information is not influenced by my prior experiences	3	1.7	60	33.3	90	50	27	15
5. My understanding and interpretation of students' emotion does not affect my selection of content and methods of teaching to facilitate students learning	11	6.1	41	22.8	48	26.7	80	44.4

Discussion

The findings revealed that pre-service received at training adequate knowledge about the subject matter, general pedagogical knowledge and knowledge about learners and their characteristics to make them effective teachers of physical education. This finding is supported by Grossman et al. (2005) and Grossman (1990) who

stressed that teachers' subject matter knowledge is key to effective teaching since subject matter knowledge influences what pre-service teachers teach and the methods of instruction used during teaching. Similarly, McDiarmid, Ball, and Anderson (1989) observed that teachers capacity to pose questions, select tasks, evaluate their pupils' understanding and make curricular choices all depend on the amount of subject matter they have received at training and how they themselves understand the subject matter. This implies that teachers need much deeper and more critical understanding of the subject matter to be able to develop, select and use appropriate representation to ensure effective teaching.

The findings also suggests that the pedagogy component of the physical education teacher education programme in Ghana provide opportunities for pre-service teachers to acquire at training specific knowledge of how to manage, assess, and instructionally facilitate student learning through text. Additionally, the findings show that pre-service teachers acquire at training knowledge about teaching strategies, information to plan, and when to use a variety of teaching styles for the understanding of concepts and lesson content to facilitate student learning. Furthermore, the findings suggest that the acquisition of general pedagogical knowledge during methods course enabled the pre-service teachers to prepare adequately as well as organize and manage the learning environment to enhance effective use of instructional time. Rovegno et al. (2003) revealed that when pre-service teachers are aware of a wide variety of teaching or instructional strategies for the teaching of a particular content of instruction, they are able to explain concepts to learners to enhance positive learning outcomes. Kinchin and O'Sullivan (2003) corroborated Rovegno et al. when they indicated that when pre-service teachers' are aware of a wide variety of teaching or instructional strategies, they are able to design their instructional tasks, group decision making and problem solving to give students a sense of ownership and control of their learning experience to enhance student engagement and success during the learning process.

The findings of this study again have shown that the pre-service teachers have knowledge of their learners and their characteristics

to ensure positive learning outcomes in their students. Simply stated, the pre-service teachers acquired at training knowledge about students emotions to help them design instructional task and create a healthy learning environment to enhance effective use of instructional time. Furthermore, pre-service teachers are aware of the perceptions and experiences that students are likely to bring into the classroom during teaching. As a result, they are able to reconcile students previously held information with new knowledge to aid students understanding of the content.

Hargreaves (1998b, 1998c) observed that the emotional understanding teachers share with their students appears to influence teaching and learning. McCaughtry (2004) found that teachers' understanding and interpretation of student emotion affect their selection, order, and formulation of curriculum units as well as pedagogical approaches and interactions during instruction in order to facilitate students learning. McCaughtry and Rovegno (2003) also pointed that students' emotional reactions to a teacher's instruction can provide the teacher with critical information to evaluate its success and future instruction. Similarly, Hargreaves (1998b, 1998c) and McCaughtry (2004b, 2005) noted that teachers' interpretations of students' emotional dispositions and personalities influence how they provide feedback, assign leadership positions, plan management strategies, pedagogical approaches, and curricular structures. Pajares (1992) reported that pre-service teachers' perceptions are key to the way they acquire knowledge and interpret course material to support their own perceptions about teaching during pedagogical training.

Conclusions

Pre-service teachers at the Colleges of Education in Ghana received at training sufficient instructions in Physical Education about the subject matter, general pedagogical practices and information about their learners and their characteristics to enable them teach the content of instruction effectively to enhance positive learning outcomes in their students. Also, pre-service teachers acquired at training adequate knowledge about their learners and their characteristics to make them effective teachers in Physical Education. These imply that content of the curriculum is

well tailored to meet the teaching demands of prospective teachers. Thus, the education division must keep to, monitor and supervise the present syllabus being used by the Colleges of Education since the pre-service teachers in this study have proved that they received sufficient instructions to make them effective teachers in Physical Education.

References

Albalawi, A., & Badawi, M. (2008). Teachers' perception of e-learning at the University of Tabuk. In G. Richards (Ed.), Proceedings of world conference on e-learning in corporate, government, healthcare, and higher education 2008 (pp. 2434-2448). Chesapeake, VA: AACE.

Ball, D., & MacDiarmid, G. (1990). The subject matter preparation of teachers. In W.R. Housron (Ed.), Handbook of research on teacher education (pp. 437-449), New York: Macmillan.

Fraenkel, J. R., & Wallen, N. E. (2000). How to design and evaluate research in education. (4th ed.). Boston: McGraw- Hill Inc.

Ghana Physical Education and Sports think Tank. (2009, July 29). Are there physical education teachers at the elementary school level? Ghanaian Times (No. 13442), p. 22.

Grossman, P. L. (1990). The making of a teacher: Teacher knowledge and teacher education. New York: Teacher College Press.

Grossman, P., Schoenfeld, A., & Lee, C. (2005). Teaching subject matter. In L. Darling-Hammond & J. Bransford (Eds.), Preparing teachers for changing world (pp. 201-231). San Francisco: Jossey-Bass.

Hargreaves, A. (1998b). The emotional practice of teaching. Teaching and Teacher Education, 14, 835–854.

Hargreaves, A. (1998c). The emotions of teaching and educational change. In A. Hargreaves (Ed.), International handbook of educational change, (pp. 558-575). London: Kluwer Academic Publishers.

Kinchin, G., & O' Sullivan, M. (2003). Incidences of student support for and resistance to a curricular innovation in high school physical education. Journal of Teaching in Physical Education, 22, 245-257.

McCaughtry, N. (2004). The emotional dimensions of a teacher's pedagogical content knowledge: Influences on content, curriculum, and pedagogy. Journal of Teaching in Physical Education, 23, 30-47.

McCaughtry, N. (2004b). The emotional dimensions of a teacher's pedagogical content knowledge: Influences on content, curriculum and pedagogy. Journal of Teaching in Physical Education, 23, 30–47.

McCaughtry, N., & Rovegno, I. (2003). The development of pedagogical content knowledge: Moving from blaming students to predicting skilfulness, recognizing motor development, and understanding emotion. Journal of Teaching in Physical Education, 22, 355–368.

McWilliam, H. O. A., & Kwame-Poh, M. A. (1978). The Development of education in Ghana. Hong Kong: Commonwealth Printing Press Ltd.

Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. Review of Educational Research, 62 (3), 307–332.

Rovegno, I., Chen, W., & Todorovich, J. (2003). Accomplished teachers' pedagogical content knowledge of teaching dribbling to third grade children. Journal of Teaching in Physical Education, 22, 426-449.

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. Harvard Educational Review, 57, 1-22.

VOLUME 8
ISSUE 1, 2015

Analysis of Cardiorespiratory Fitness of 9-11 year Old Primary School Children in Nigeria Using Blood Pressure and Vital Capacity

Babalola, Joseph Folorunso & Nna, Charity Chidinma
Corresponding author Department of Health, Physical Education and Recreation, University of Cape Coast, Ghana

Abstract

The skeletal muscle has the ability to extract and use oxygen for generation of energy to perform physical activities. This ability is referred to as cardiorespiratory fitness. The variables measured in this study were resting systolic and diastolic blood pressure, vital capacity and forced vital capacity. Four hypotheses tested at 0.05 alpha level. There were significant differences between the participants and the standard norms in all the variables studied in this research. Resting systolic blood pressure (t-Cal= 190.576 > t-Crit.=2.021, P<0.05); Resting diastolic blood pressure (t-Cal=51.951> t-Crit.=2.01, P<0.05); Vital Capacity (t-Cal=-31.527> t-Crit. = 2.021, P<0.05); Forced Vital Capacity (t-Cal=13.951 > t-Crit. = 2.021, P<0.05); Generally, it was observed that the cardiorespiratory fitness level of the participants was low despite the significant difference in the variables when compared to the standard norm. A programme should be designed to encourage children to lose weight in a healthy manner, thus reducing their BMI and improve their physical fitness, and general wellbeing. Parents should guide the pupils to spend less time on computer games and encourage active physical exercises in form of trekking to school where possible, in order to enhance their cardiorespiratory fitness.

Keywords: Cardiorespiratory fitness, Primary school children, Blood pressure

Introduction

Cardiorespiratory fitness also known as cardiopulmonary fitness is a health-related component of physical fitness that measures the ability of the heart to pump blood and the ability of the skeletal muscle to extract and use oxygen. It is a condition when the heart, through the blood vessels, and respiratory system are able to supply the working muscles with oxygen and nutrients. The performance of the heart indicates the state of an individual's cardiovascular system functionality. Therefore, cardiorespiratory fitness is a measure of how well the body is able to transport oxygen to the working muscles during prolonged exercise. McArdle, Katch and Katch, (2000) said that cardiorespiratory fitness shows how well the muscles are able to absorb and use the oxygen, once it has been delivered, to generate adenosine triphosphate (ATP) which is the energy source, via cellular respiration. Indices of cardiorespiratory fitness include Systolic and Diastolic Blood Pressure, Mean Arterial Blood Pressure, Heart Rate, Respiratory Rate, Vital Capacity, Peak Expiratory Flow Rate and Maximum Oxygen Consumption (Ross & Wilson, 2006).

Blood pressure is the pressure that blood exerts on the wall of the blood vessels. The pressure originates in the contraction of the heart, in turn, forcing blood out of the heart and into the blood vessels. The force is caused by the pumping action of the heart which sends blood to all parts of the body, through the arteries (McGlynn, 1999; McArdle et al., 2000). Blood pressure is affected by exercise in that it rises during sports performance which may be due to an increase in stroke volume and heart rate brought about by nervous and hormonal influences (Heyward, 2002).

There are two mechanisms that take place in the heart. These are systole and diastole. Systole is the contraction of the heart chambers while diastole is the relaxation of the chambers. The normal blood pressure that is considered to be at a safe level is 120/80. The figure 120 is measured through systole while the 80 accounts for diastole. The systolic pressure will show the pressure that the heart emits when blood is forced out of the heart while diastolic pressure is the pressure that the heart shows when it is

relaxing. This is the main mechanism by which blood pressure operates (Heyward, 2002).

Vital capacity refers to the maximum amount of air that a person is capable of expelling from the lungs after maximum inhalation. This is equal to the sum of inspiratory reserve volume, expiratory reserve volume and tidal volume. A person's vital capacity can be measured using a regular or wet spirometer. Measurement of vital capacity can help the physician to determine if a patient is suffering from any underlying lung disease. Researches have found that exercises can help to increase vital capacity while smoking decreases it (Pollock et al., 1998; Adegoke & Arogundade, 2002; Fabunmi, 2011). The measurement of vital capacity in an adult can show a value of between 3 and 5 liters. Demographic factors that can affect an individual's vital capacity are height, weight, sex, age and ethnicity. A low vital capacity is associated with a disability, obesity or chronic respiratory disease (Freedman, Dietz, Srinivasan, & Berenson, 2004).

There seems to be very few studies on the fitness levels of children in Nigeria. There are also few indigenous studies with particular reference to cardiorespiratory fitness of primary school children. Most previous research efforts in Nigeria have concentrated on cardiorespiratory fitness of athletes and adult sedentary individuals (Adegoke & Arogundade, 2002; Fabunmi, 2011). Many of the pupils within the age bracket of this study (9-11 years) prefer to play computer games instead of engaging in physical exercises. Some are chauffeur driven to school in their parents' cars, many of them use taxi cabs or motor cycles thus making them sedentary and with little or no opportunity for physical activities.

Methodology

Ex-post facto research design was used for this study. Measurements of resting systolic and diastolic blood pressure, vital capacity and forced vital capacity were taken using standardized instruments that were valid and reliable. The nature, purpose and procedure of the research were explained to the participants in

detail. Written informed consent was also obtained from the prospective participants' teachers/parents prior to data collection.

Blood Pressure: The blood pressure was measured using sphygmomanometer and stethoscope. At the arrival at the venue of study, each participant was made to be in sitting position and be allowed to rest for 5 minutes before commencement of the measurement. The participant sat on a chair, while the left arm freed from clothing was positioned so that the brachial artery (at the antecubital crease) was held at heart level, roughly at the junction of the 4th intercostals space with the sternum. The cuff of the sphygmomanometer was then wrapped around the left arm about 2.5 centimeters above the antecubital crease (Amusa, Igbanugo & Toriola, 1998). The sphygmomanometer was inflated and gradually deflated during which the resting systolic and diastolic blood pressure was taken and recorded.

Vital capacity: The participant while in erect position was instructed to take a deep breath to fill the lung as much as possible and then place his/her lips over the end of the spirometer tube, to form an air tight seal and exhale as quickly as possible, blowing (Thomas & Nelson, 2001). This was repeated 3 times. The values of vital capacity were read on the spirometer.

Forced Vital Capacity (FVC): In erect position, the participants were required to make a maximal inspiratory effort with lips tightly closed around the mouthpiece of the portable spirometer and exhale forcefully and continuously through the mouthpiece into the Spirometer. The values of the forced vital capacity were read on the spirometer.

Results

Data were analysed using one sample t-test to compare the obtained values with the existing standard norms and independent t-test to compare the participants by gender all at 0.05 level of significance.

Table 1: Percentage Age Distribution of the Participants

	Boys		Girls			
Age in years	No	%	No	%	Total	%
9	13	52	15	60	28	56
10	8	32	6	24	14	28
11	4	16	4	16	8	16
Total	25		25		50	100%

The table 1 above shows the percentage age distribution of the participants. Twenty eight representing (56%) of participants were nine years old comprising of 13 boys and 15 girls. Fourteen of them were 10 years old, making 28 percent while eight participants were 11 years old making 16 percent. This shows that respondents with age of 9 years have the highest percentage.

Table 2: Gender Distribution of the Participants

Sex	No	Percentage %
Male	25	50%
Female	25	50%
Total	50	100%

Table 2 shows the gender distribution of the participants. The table shows that 25 participants or 50% were boys and 25 participants or 50% were girls. This implies that equal percentage of sex was used for the study.

Table 3: Summary of the t-test statistics on Cardiorespiratory Fitness between the male and female Primary School Pupils.

Variable	Gender	N	Mean	Std. Dev.	Crit.-t	Cal.-t	df	Sig. (2 tail)	Remark
RSBP	Male	25	101.2000	5.2599					
					2.00	.336	49	.738	NS
	Female	25	100.8000	2.7689					
RDBP	Male	25	71.6000	6.2450					
					2.00	.993	49	.326	NS
	Female	25	73.4000	6.5701					
VC	Male	25	.2336	.1531					
					2.00	.126	49	.900	NS
	Female	25	.2236	.1816					
FVC	Male	25	.3660	.1881					
					2.00	.166	49	.860	NS
	Female	25	.3836	.1846					

Keys

RSBP Resting Systolic Blood Pressure
RDBP Resting Diastolic Blood Pressure
VC Vital Capacity
FVC Forced Vital Capacity

A critical view of the Table 3 shows that there were no significant differences in the Cardiorespiratory Fitness between the male and female participants of this study. However, for hypotheses testing, when the two sexes were combined and the values were compared to the standard norms there were significant differences in the variables of study as shown in Table 4.

Table 4: Summary of the t-test statistics on Cardiorespiratory Fitness of Primary School Pupils Compared to Standard Norms

Variables / Std. Norm	Pair t-Test	N	Mean	Std. Dev	t. Cal	t. Crit.	df.	Sig. (2 tail)	Remark
RSBP	RSBP	5	100.4	1.97	190.57	2.02	49	0.00	Sig
Std. Norm	80-130	0	0	9	6	1	49	0	Sig
RDBP	RDBP	5	72.50	6.71	51.951	2.02		0.00	
Std. Norm	50-80	0	.229	9	-31.527	1	49	0	Sig
VC	VC	5		.169		2.02	49	0.00	Sig
Std. Norm	1.75 FVC	0	.390	.187	-32.621	1		0	
FVC	2.29	5				2.02		0.00	
Std. Norm		0				1		0	

KEYS

RSBP	Resting Systolic Blood Pressure
RDBP	Resting Diastolic Blood Pressure
VC	Vital Capacity
FVC	Forced Vital Capacity
Std. Norm	Standard Norm

Hypothesis 1

Ho:- There will be no significant difference in the resting systolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to standard norm.

Table 4 shows that there is a statistical significant difference in the resting systolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to the Standard Norm. It was observed that the t- Calculated value was greater than t-Critical value (t-Cal= 190.576 > t-Crit. = 2.021, p<0.05). This shows that there was significant difference. The null hypothesis one was rejected. Therefore it was concluded that, there is a significant difference in the resting systolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to the standard norm.

Hypothesis 2

Ho:- There will be no significant difference in the resting diastolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to standard norm.

Table 4 shows that there is a statistical significant difference in the resting diastolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to the Standard Norm. It was observed that the t- Calculated value was greater than t-Critical values (t-Cal=51.951> t-Crit. = 2.01, P<0.05). This shows that there was a significant difference. The null hypothesis two was rejected. Therefore it was concluded that, there is a significant difference in the resting diastolic blood pressure of male and female 9 to 11 years old primary school pupils when compared to the standard Norm.

Hypothesis 3

Ho:- There will be no significant difference in the Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to standard norm.

Table 4 shows that there is a statistical significant difference in the Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to the Standard Norm. It was observed that the t- Calculated value was greater than t-Critical values (t-Cal=-31.527> t-Crit. = 2.021, P<0.05). This shows that there was a significant difference. The null hypothesis three was rejected. Therefore it was concluded that, there is a significant difference in the Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to the Standard Norm.

Hypothesis 4

Ho:- There will be no significant difference in the Forced Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to the standard norm.

Table 4 shows that there is statistical significant difference in the Forced Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to the Standard Norm. It

was observed that the t- Calculated value was greater than t-Critical values (t-Cal=-32.621> t-Crit. = 2.021, P<0.05). This shows that there was significant difference. The null hypothesis four was rejected. Therefore it was concluded that, there is a significant difference in the Forced Vital Capacity of male and female 9 to 11 years old primary school pupils when compared to the standard norm.

Discussion

Blood pressure

What is considered to be normal blood pressure in children depends on factors such as height, age and sex. The biggest factor in children in this study is their height; taller kids have higher normal blood pressure than shorter kids. Stratton et al., (2007) noted that it is normal for children's blood pressure to change as they get older, and grow taller.

The mean systolic blood pressure in the male participants was 100.40±1.979 while the mean diastolic blood pressure for the male and female participants was 72.50±6.719 respectively. Literature shows that for children in age 9 categories, the upper and lower limits of normal average systolic pressure ranges between 113-121 and 114-120 while upper and lower limits of normal average diastolic pressure ranges between 76-81 and 75-79. The result of this study was in congruence with these values. The values of the normal average range for children in ages 10 and 11 as recorded in literature were also in consonance with the values recorded for this study (Appendix 1).

The Low-Normal Pediatric Systolic Blood Pressure for children of school-age (6–12 years) is greater than 80 (Appendix 2). The average resting systolic blood pressure for the children in this study was 95mmHg. Blair, Kampert & Kohl, (1996), and Vincent (2014) stated that school aged children (6-12 years) have systolic blood pressure of 85-120 and diastolic blood pressure of 50-80mmHg. The statistical analysis shows that there was a significant difference in the resting systolic blood pressure of male and female 9 to 11 years old primary school pupils used in

this study, when compared to 80-130 and 50-80 which are the standard norms for Systolic Blood Pressure and diastolic blood pressure respectively.

Vital capacity

The vital capacity of the lungs is the volume of air which can be expelled after the deepest possible inhalation. The mean value for the participants in this study was 0.229±0.169. Thomas and Nelson (2001) reported that the normal range of vital capacity for a given height is estimated on the basis of these observations to be given by the equation $y = -2.41 + 0.0341\ x \pm 2(0.199)$, where y = vital capacity in liters, and x = standing height in cm. The t-Calculated value was greater than t-Critical values (t-Cal=-31.527< t-Crit. = 2.021), ($P<0.05$). This shows that there was a significant difference when the values were compared with the standard norm. Also, significant difference was reported for forced vital capacity (table 4).

Conclusion

The results show that there were significant differences between the participants and the standard norms in all the variables studied. The reason may be attributed to the developmental stage of the pupils. Finings revealed significant difference between the cardiorespiratory fitness levels of the participants when compared to the standard norm. This may result from the low level of the pupils' participation in programmed physical activities as most of them indulged in computer games instead of real physical activities.

Generally speaking, the physical fitness levels among school children have been falling leading to poor cardiorespiratory fitness. Many school children do not engage in physical exercises. This may be because of the lack of availability of qualified physical education teachers among the school staff or as a result of the lazy attitude of the few qualified physical education teachers available.

Recommendation

It was recommended that qualified physical education teachers should be employed in the primary schools to handle the course and guide the pupils during outdoor physical education classes.

References

Adegoke, O.A. and Arogundade, O. 2002. The effects of chronic exercise on lung function and basal metabolic rate in some Nigerian athletes. *African Journal of Biomedical Research* 5 pp 9-11

Amusa, L.O., Igbanugo, V.C. and Toriola, A.L. 1998. *Experiments and laboratory experiences in exercise physiology* (2nd ed.) Nigeria Lab Publication Limited.

Andersen, L.B., Wedderkopp, N., Hansen, H.S., Cooper, A.R. and Froberg, K. 2003. Biological cardiovascular risk factors cluster in Danish children and adolescents: The European Youth Heart Study. *Prev Med.* 37(4): 363–367.

Blair, S.N, Kampert, J.B. and Kohl H.W. 1996. Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. *JAMA*; 276(3):205-210

Bryman, M. A. 2001. *Fitness and wellness for life.* (7th ed.) Boston, WCB McGraw Hill Book

Chad, T. 2001. Cardio-vascular exercise principles and guidelines. Brian Barton jumpsite www.empiregym.net retrieved 14/07/2014

Church, T.S., Kampert, J.B., Gibbons, L.W. and Barlow, C.E. 2001. Usefulness of cardiorespiratory fitness as a predictor of all-cause and cardiovascular disease mortality in men with systemic hypertension. *Am J Cardiol.* 88(6):651-656

Dunn, A. Marcus, B. and Kampert, K. 1997. Reduction of cardiorespiratory disease risk factors: 6 month results from *Project active preventive medicine.* 26: 883-892.

Fabunmi, A.A. 2011. Comparative effects of a twelve-week aerobic exercise programme on respiratory functions of obese and non-obese sedentary individuals in Ibadan, Nigeria. *Unpublished Ph.D Thesis.* Department of Human Kinetics and Health Education, University of Ibadan, Ibadan.

Freedman, D.S., Dietz, W.H., Srinivasan, S.R. and Berenson, G.S. 2004. The relation of overweight to cardiovascular risk factors among children and adolescents: The Bogalusa Heart Study. *Pediatrics*. 103:1175–1182.

Heyward, V.H. 2002. *Advanced fitness assessment and exercise prescription* (4th ed) USA Human Kinetics.

Klabunde, R.E. 2005. *Cardiovascular Physiology Concepts*. Lippincott Williams & Wilkins. pp. 93–4.

McArdle, D.M., Katch, F.I. and Katch, V.L. 2000. *Essentials of exercise physiology.* 2nd ed. Philadelphia PA: Lippincott Williams and Wilkins.

McGlynn, G. 1999. *Dynamics of Fitness: A Practical Approach.* 5thed. St. Louis. The McGraw-Hall Companies Inc.

Pollock, M.C., Gaesser, G.A., Butcher, J.D., Despires, J.P., Dishman, R.K., Frankline, B.A. and Garber, C.E. 1998. Quality and Quantity of exercise for developing and maintaining cardio-respiratory and Muscular fitness and flexibility in healthy adults. *Med. Sci. Sports Exercise* 30:79-97

Ross. W. and Wilson, G. 2006. *Anatomy and physiology in health and illness.* UK: Churchill Livingstone.

Thomas, J.R. and Nelson, J.K. 2001. *Research methods in physical activity* (4th ed). United state of America. Human Kinetics.

Vincent, I. (2014) Range of Heart Rate for Children and Teens http://pediatrics.about.com/od/pediatricadvice/a/Normal-Pulse-Rates-For-Kids.htm Retrieved 13/01/2015)

Wedderkopp, N., Froberg, K., Hansen, H.S. and Andersen, L.B. 2004. Secular trends in physical fitness and obesity in Danish 9-year-old girls and boys: Odense School Child

Study and Danish substudy of the European Youth Heart Study. *Scand J Med Sci Sports.* 14(3): 150–155.

APPENDIX

Appendix 1: Average systolic and diastolic blood pressures for boys and girls

Age	Blood Pressure	Boys	Girls
Age 9	Normal average systolic pressure	Ranges between 113-121	Ranges between 114-120
Age 9	Normal average diastolic pressure	Ranges between 76-81	Ranges between 75-79
Age 10	Normal average systolic pressure	Ranges between 114-123	Ranges between 116-122
Age 10	Normal average diastolic pressure	Ranges between 77-82	Ranges between 77-80
Age 11	Normal average systolic pressure	Ranges between 116-125	Ranges between 118-124
Age 11	Normal average diastolic pressure	Ranges between 78-83	Ranges between 78-83

(Adapted from http://www.md-health.com/Normal-Blood-Pressure-For-Children.html)

Appendix 2: Low-Normal Pediatric Systolic Blood Pressure

Age*	Low Normal
Infant (birth–1 year)	greater than 60*
Toddler (1–3 years)	greater than 70*
Preschooler (3–6 years)	greater than 75
School-age (6–12 years)	greater than 80
Adolescent (12–18 years)	greater than 90

(https://www.health.ny.gov/professionals/e)

AWARENESS OF THE BENEFITS OF GINGER USE AMONG STUDENTS OF NIGERIA ARMY SCHOOL OF EDUCATION, SOBI-ILORIN, KWARA STATE

[*1]Dominic, Olufunmilola L., [2]Muhammad Abdullahi, M., & [2]Seidina, Iliasu Y.
[1]Department of Health, Physical Education and Recreation, University of Cape Coast, Ghana.
[2]Department of Human Kinetics Education, University of Ilorin, Ilorin Nigeria.

*Corresponding Author: lolafunmidom@gmail.com

Abstract

The objective of this study was to determine the level of awareness, knowledge of benefits and use of ginger among the students of the Nigerian Army School of Education (NASE), Sobi-Ilorin Kwara State. The descriptive survey design was used to elucidate the awareness, knowledge of benefits and practice of ginger use. The population was all 350 students of NASE, Ilorin. They were purposively selected, from which 337 validly participated. The instrument for data collection was a validated researcher-structured questionnaire. Test retest reliability was conducted and PPMC coefficient (r = 0.72) was obtained. Frequency and percentage were used for demographic data while t-test was used for testing the hypotheses at 0.05 alpha level. The result revealed that NASE, Ilorin students were highly aware of ginger, 312 (92.6%). There was significant difference between soldiers and officers in; awareness n = 337, t (335) = 4.94, p = 0.001, η^2 = .007; health benefits n = 337, t (335) = 2.92, p = 0.004, η^2 = .002 and performance purposes n = 337, t (335) = 2.48, p = 0.001, η^2 = .002. It was concluded that majority of NASE students are aware

of ginger, which they mainly consumed as drinks. Further study is necessary to ascertain the size of benefits and the best way ginger use would enhance the health and job performance of military personnel.

Keywords: Awareness, Ginger, Health, Performance, Supplements

Introduction

Ginger, a natural spice, is commonly use among Nigerian populace for several purposes. Some of these purposes includes spice, herbal remedy, flavour and treatment of different illnesses. Over the last few years, there has been a substantial rise in the use of natural or alternative medicine among adults. These complementary and alternative medicine in the form of dietary supplements and herbal remedies are subscribed to on the premise that they have beneficial effects without advice from the physician (Cohen, Ek & Pan, 2002). Ginger (*Zingiber officinale Roscoe, Zingiberaceae*) has been in existence for thousands of years and it is one of the most commonly consumed dietary condiments in the world (Surh, Park, Chun, Lee, Lee& Lee, 1999). Ginger contains many bioactive components which are believed to exert a variety of remarkable pharmacological and physiological activities like treatment of numerous ailments, such as colds, nausea, arthritis, muscle pain, migraine, and hypertension (Nicoll & Henein, 2009; Ali, Blunden, Tanira & Nemmar, 2007).

The major producers of Ginger today are China and tropical/subtropical places in Asia, Brazil, Jamaica and Nigeria (Osabor, Bassey & Umoh, 2015). The ginger plant is approximately 30 - 60 cm tall and is extremely rare to find in the wild. Ginger's current name comes from the Middle English *gingivere*, but this spice dates back over 3000 years to the Sanskrit word *srngaveram*, meaning "horn root," based on its appearance. In Greek, it was called *ziggiberis*, and in Latin, *zinziberi*. Indians and Chinese are believed to have produced ginger as a tonic root for over 5000 years to treat many ailments, and this plant is now cultivated throughout the humid tropics, with India being the largest producer. Ginger was used as a flavouring agent long before history was formally recorded (Utuk, 2017).

Ginger was an exceedingly important article of trade and was exported from India to the Roman Empire over 2000 years ago, where it was especially valued for its medicinal properties. It continued to be a highly sought after commodity in Europe even after the fall of the Roman Empire, with Arab merchants

controlling the trade in ginger and other spices for centuries. In the thirteenth and fourteenth centuries, the value of a pound of ginger was equivalent to the cost of a sheep. During the medieval times, it was imported in preserved form to be used in sweets. Queen Elizabeth I of England is credited with the invention of the gingerbread man, which become popular Christmas treat (Ferguson, 2014).

At least 115 constituents have been identified by a variety of analytical processes in fresh and dried ginger varieties. Gingerols are the major constituents of fresh ginger, gingerols are founds lightly reduced in dry ginger, whereas the concentrations of shogaols, which are the major gingerol dehydration products, are more abundant in dry ginger than in fresh ginger (Jolad, Lantz, Chen, Bates & Timmermann, 2005). Ginger contains at least 14 bioactive compounds, including 4-gingerol, 6-gingerol, 8-gingerol, 10-gingerol, 6-paradol, 14-shogaol,6-shogaol, 1-dehydro-10-gingerdione,10gingerdione,hexahydrocurcumin,tetrahydrocurcumin, gingerenone A, 1,7-bis-(4′ hydroxyl-3′ methoxyphenyl)-5-methoxyhepthan-3-one and methoxy- 10-gingerol (Koh, Kim & Kim, 2009). Scientists have reported that the proportion of each individual component in a sample of ginger depends on country of origin, commercial processor and whether the ginger is fresh, dried, or processed (Bailey-Shaw et al, 2008; Schwertner, Rios & Pascoe, 2006)

The most common and well-established use of ginger throughout history is utilization in alleviating symptoms of nausea and vomiting. Quimby (2007) and Thompson and Potter (2006) reported via several controlled studies that ginger is generally effective as an antiemetic (drug that control vomiting and nausea). The effectiveness of ginger as an antiemetic has been attributed to its carminative (an herb or preparation that prevent gas formation) effect, which helps to break up and expel intestinal gas. This idea was supported by the results of a randomized, double-blind trial in which healthy volunteers reported that ginger effectively accelerated gastric emptying and stimulated antral contractions (Wu, Rayner & Chuah,2008).Ginger root contains a very high

level (3.85 mmol/100g) of total antioxidants, surpassed only by pomegranate and some types of berries (Halvorsen, 2002).Topic et al (2002) reported that ginger reduced age-related oxidative stress and ethanol induced hepatotoxicity (chemical-driven liver damage). The work of El-Sharaky, Newairy, Kamel and Eweda (2009); Ahmed et al (2008) also noted that ginger protects the levels of reduced glutathione (antioxidant) and suppresses lipid peroxidation (a process by which free radicals steal electron from cell membrane there by causing damage to the cell).

One of the many health claims attributed to ginger is its ability to decrease inflammation, swelling and pain. Young et al (2005) and Minghett, Sosa and Cilurzo (2007) reported that 6-gingerol, a dried ginger extract and a dried gingerol-enriched extract exhibit some level of analgesic and potent anti-inflammatory effects. Aside the anti-inflammatory effect, ginger, it is also effective against osteoarthritis and rheumatism Reginster, Gillot, Bruyere and Henrotin (2000). There are *in vitro* and animal data supports its benefits in alleviating cardiovascular disease, as well as the anti-inflammatory, antioxidant, antiplatelet, hypotensive and hypolipidemic effects of this condiment are well documented (Nicoll & Henein, 2009). An aqueous ginger extract was reported to induce a dose-dependent decrease in arterial blood pressure in a variety of animal models (Ghayur & Gilani, 2005). Furthermore, a ginger extract inhibited airway contraction and associated calcium signalling, possibly by blocking plasma membrane in calcium channels. Dried form of ginger was also beneficial in treating dementia, including Alzheimer's disease (Ghayur et al., 2008). El-Abhar, Hammad and Gawad (2008) reported that in rats, ginger extract alleviated the symptoms of acetic acid-induced ulcerative colitis.

Ginger is found virtually in every market in Nigeria either in dried or fresh form. The plant has a high medicinal and food value. It is cultivated in large quantities by many farmers in northern part of Nigeria (Kaduna, Benue, Nassarawa, Niger and Gombe).

The ginger root is used in Nigeria as herbal medicine and in homes as spice for pap, flavour soup and other delicacies, drinks and treatment of various illness (Utuk, 2017).

Orally, ginger is usually well tolerated when used in typical doses. However, higher doses of 5 g per day increase the risk of side effects and decrease tolerability. Common side effects of ginger include abdominal discomfort, heartburn, diarrhoea and a pepper like irritant effect in the mouth and throat. Topically, ginger can cause dermatitis in sensitive individuals (Akram et al, 2011). This implies that ginger must not be consumed in excess so that its health benefits will not be compromised.

Nutrients in the form of dietary supplement can improve performance during physical activity. Athletes across Nigeria commonly take different types of supplements to boost their performance during physical activity or competitive sports including local supplement such as Zobo, Kunu and herbs (Amina et al, 2014). These local supplement are virtually found in every market in Nigeria most especially ginger, which is a commonly consumed dietary spice. However, the use of ginger as supplement in boosting performance as well as recovery was supported by limited studies. This was evident in the work of Mashhadi, et al (2013); which revealed that ginger has effect as anti-oxidative and anti-inflammatory in promoting health and physical activity. Furthermore, it was buttressed by Nafiseh et al (2013), that ginger can increase performance in exercise. Melissa, Matsumura, Gerald, Zavorsky, James (2015) also reported that ginger can delay the onset of muscle soreness and enhance recovery of damage muscle.

Several researches have confirmed ginger to have beneficial role in the biological system ranging from alleviation of respiratory illnesses to enhancing the immune system and physical alertness as well as performance exercise (Nafiseh et al, 2013). The researcher observed that the use of ginger is not new in NASE Sobi-Ilorin Kwara State which implies some level of awareness among the students. This might improve their day-to-day activities, since their profession requires physical alertness and optimal performance if they must survive.

However, there is no empirical evidence to support this assumption. Therefore, it became imperative to find out the participants' level of ginger awareness, the benefits and differences in ginger use between officers and soldiers.

Methods

The descriptive research survey was adopted. The population was all the registered 350 male and female students of NASE Sobi-Ilorin, Kwara State, Nigeria. All the students were purposively selected for the study because they possess similar characteristics and met the inclusion criteria of being military personnel, studying and resident at NASE Sobi-Ilorin. The valid sample was 337 respondents that consisted of 232 soldiers and 105 officers with an age range of 18-50 years. A researcher-structured questionnaire which contained 30 items that were divided into sections A and B was used for data collection. Section A dealt with demographic data of the participants while section B dealt with level of awareness and benefits of ginger use. The questionnaire was validated and subjected to test retest reliability which was conducted at the base of 222 Battalion, Nigerian Army Sobi-Ilorin with two weeks interval between the first and second administration. Pearson Product Moment Correlation (PPMC) was used to determine the reliability level and $r = 0.72$ was obtained. The participants were duly enlightened and informed consent was obtained from them before data collection. Frequency and percentage were used for analysis of demographic characteristics and answering the research questions while t-test was used to test the hypotheses at 0.05 level of significance. All the statistical analysis was conducted using Statistical package for Social Sciences (SPSS Version 20.0).

Results

Table 1: Level of Ginger Awareness among NASE Students in Sobi-Ilorin, Kwara State

Variable	All Students N (%)	Officers N (%)	Soldiers N (%)
Have you ever seen ginger?			
Yes	312 (92.6%)	99 (94.3%)	213 (91.8%)
No	25 (7.4%)	6 (5.7%)	19 (8.2%)
Total	**337 (100%)**	**105(100%)**	**232 (100%)**
Do you take ginger drink?			
Yes	274 (81.3%)	91 (86.7%)	183 (78.9%)
No	47 (13.9%)	14 (13.3%)	49 (21.1%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**
How often do you use ginger?			
Daily	79 (23.4%)	20 (19.0%)	59 (25.4%)
Weekly	80 (23.7%)	29 (27.6%)	51 (22.0%)
Monthly	52 (15.4%)	19 (18.1%)	33 (14.2%)
Can't remember	99 (29.6%)	37 (35.2%)	85 (36.6%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**

Result in table 1 revealed that majority of NASE, Sobi-Ilorin students 92.6% (312) have seen ginger before, 7.4% (25) have not; 81.3% (274) of them take ginger drink while 13.9% (47) of them did not. In addition, 23.4% (79) of them use ginger daily, 23.7% (80) use it weekly, 15.4% (52) use it monthly, while 29.6% (99) cannot remember how often they use it. However soldiers use ginger products daily while officers use more weekly and monthly. Further consideration by job status shows that majority of the officers 94.3% (99) have seen ginger while just 5.7% (6) have not.

Among the soldiers, 91.8% (213) of them have seen ginger while8.2% (19) have not. Majority of the officers 86.7% (91) drink ginger while 13.3% (14) did not. For the soldiers, 78.9% (183) of them drink ginger while 21.1% (49) of them did not. This result implies that students of NASE, Sobi-Ilorin have good awareness level of ginger and its products, and ginger is part of the nutrients in the diets they consume.

Table 2: Benefits of Ginger Use among Students of NASE, Sobi-Ilorin, Kwara State

Benefits	**All Students N (%)**	**Officers N (%)**	**Soldiers N (%)**
Health Benefits			
As pain reliever			
Yes	173 (51.3%)	38 (36.2%)	135 (58.2%)
No	164 (48.7%)	67 (63.8%)	97 (41.8%)
Total	**337 (100%)**	**105(100%)**	**232 (100%)**
To stimulate appetite			
Yes	198 (58.8%)	47(44.8%)	151 (65.1%)
No	139(41.3%)	57(55.2%)	81(34.9%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**
Nutritional Benefit			
As spice			
Yes	280 (83.1%)	91 (86.7%)	139 (81.5%)
No	57 (16.9%)	14 (13.4%)	43 (18.5%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**
Performance Benefits			
For boosting stamina			
Yes	198 (58.8%)	49(46.7%)	149(54.2%)
No	139(41.3%)	56 53.4 (%)	83 (35.7%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**

To be active and alert			
Yes	195 (57.9%)	51 (48.6%)	144 (62.1%)
No	142 (42.1%)	54 (51.5%)	88 (37.9%)
Total	**337 (100%)**	**105 (100%)**	**232 (100%)**

Table 2 reveals that the respondents used ginger for different purposes such as health (pain reliever and stimulating appetite), nutritional (spice) and performance (boosting stamina, activeness and alertness).Majority of the students 173 (51.3%) used ginger as pain reliever, among which, 36.2% (38) of them were officers and 58.2% (135) of them were soldiers. The result also shows that majority of the students 58.8% (198) used ginger for boosting stamina. These comprised of 46.7% (49) officers and 149 54.2% (149) soldiers. Majority of the students used ginger for stimulating appetite; these comprised of 44.8% (47) officers and 65.1% (151) soldiers. Furthermore, majority of the students used ginger to improve alertness and activeness for optimal performance in their job. Among these were 48.6% (51) officers and 62.1% (144) soldiers.

Table 3: t-test Analysis for Difference in Ginger Use between Officers and Soldiers

Variables and Groups	**n**	**M ± SD**	**MD**	**t**	**df**	**SED**	η^2	**Sig**
Ginger Awareness:								
Soldiers	232	9.32 ± 1.32	1.67	4.94	335	1.02	.007	0.001
Officers	105	7.65 ± 0.22						
Total	**337**	**16.97 ± 1.54**						
Health Benefits from Ginger Intake:								
Soldiers	232	10.60	0.94	2.92	335	0.32	.002	0.004

		± 2.56						
Officers	105	11.53 ± 2.68						
Total	**337**	**22.13 ± 5.24**						
Performance Benefits from Ginger Intake:								
Soldiers	232	5.13 ± 1.40	0.45	2.48	335	0.18	.002	0.001
Officers	105	5.58 ± 1.54						
Total	**337**	**10.71 ± 2.94**						

$p \leq 0.05$

Table 3 shows result of t-test analyses conducted to examine the differences in ginger use between officers and soldiers. There was significant difference between soldiers and officers in all the tested variables: level of ginger awareness (*n = 337, M ± SD = 9.32 ± 1.32, t (335) = 4.94, MD = 1.67, SED = 1.02, p =.001*); health benefits from ginger intake (*n = 337, M ± SD = t (335) = 2.92, MD = 0.94, p = 0.004*) and performance benefits from ginger intake (*n = 337, t (335) = 2.48, MD = 0.45, p = 0.001*). Despite reaching statistical significance, the magnitude of the differences was small η^2 = .007, .002 and .002 for awareness, health and performance benefits respectively.

Discussion

The study investigated awareness and practice of ginger use among 337 students of Nigerian Army School of Education (NASE) Sobi-Ilorin, Kwara State. The awareness of ginger and ginger products among NASE, Sobi-Ilorin students was generally high. Majority of the respondents had seen and consumed ginger in different forms and for different health and performance benefits.

Surh et al., (1999) that ginger is a common dietary condiment that has been consumed over a thousand, it was found in this study that few of the students actually used ginger as often as daily, and a fewer of them used it weekly or monthly.

It was revealed that the officers had seen and taken ginger drink more than soldiers did. However, more soldiers (25.4%) used ginger daily than officers (19.0%) did but on weekly and monthly basis; the officers (27.6% and 18.1%) used it more than the soldiers (22.0% and 14.2%) respectively. Since ginger is used for diverse purposes, this disparity between soldiers and officers might be due to the level of interaction, their cultural backgrounds and/or nutritional practices in the different units they had been posted to serve within the army. This corroborates the assertion of Gosh, (2011) that ginger is used in different ways including boosting appetite, alleviating cold and nausea.

The finding also revealed that more soldiers used ginger for relieving pain (58.2%) and stimulating appetite (65.1%) than officers (36.2% and 44.8%) respectively. The nature of soldiers' job requires them to be on the fields always while officers perform their job mainly from the office excluding the few on special duties. Since ginger has different bioactive compounds that yield several health benefits, the soldiers could have observed this and used ginger more because of their higher exposure to health hazards while on the fields. The high level of ginger usage as well as the little disparity in use, confirms the postulations of Nafiseh et al, (2013), Nicoll and Henein (2009) and Ali et al, (2008) that ginger has remarkable benefits for health and treatment of ailments. So also among the students based on their cultural, social, occupational setting and health needs.

Majority of the soldiers preferred to use ginger for boosting stamina, activeness and alertness more than the officers did. It is well established that the physical demand of the military's job requires high level of fitness and alertness for optimal performance at all times. While this is crucial in military training, the soldiers of NASE, Sobi-Ilorin proved to be using ginger more than the officers to minimise fatigue, boost stamina and alertness which is

crucial for their job as revealed in table 3. This finding is similar to the view of Nafiseh et al (2013) and Bentley et al (2012) that ginger intake increases exercise performance among humans. This might be one of the reasons why soldiers whose occupation require optimal performance, activeness and alertness used ginger and its products daily unlike the officers whose duties are more from the office rather than the field.

Conclusion

Majority of the students had awareness of ginger and mainly consumed it as drink. Their frequency of use was generally low, just a few used it daily while even fewer of them used it weekly or monthly. The most common health benefits the NASE students derived using ginger was relieving pain, stimulating appetite, activeness and alertness. There was difference in the awareness, knowledge of benefit and use of ginger among officers and soldiers. The officers mostly consumed ginger to derive nutritional benefits but the soldiers used it for both nutritional and performance enhancement. We recommend that further studies should be carried out to elucidate the specific benefit of ginger on the health and performance of NASE students, the general military performance and the appropriate time of use and dosage regimen in order to avert possible adverse effect of ginger overuse.

References

Akram, M.M., Ibrahim, S., Khan, U.E., Mohiuddin, A., Sami, M., Asif, S.M., Ali, S., Khalil, A. &Ghazala, S. (2011). *Zingiber officinale Roscoe* (A Medicinal Plant), *Pakistan journal of. Nutrition*, 10 (4), 399-400.

Ali, B.H., Blunden, G., Tanira, M.O. & Nemmar, A. (2008). Some phytochemical, pharmacological and toxicological properties of ginger (*Zingiber officinale Roscoe*): A review of recent research. *Food Chem Toxicol*., 46(2), 409–20.

Ahmed, R.S., Suke, S.G., Seth, V., Chakraborti, A., Tripathi, A.K. & Banerjee, B.D. (2008). Protective effects of dietary ginger (*Zingiber officinales Rosc.*) on lindane-induced oxidative stress in rats. *Phytother Res*, 22(7), 902–6.

Amina A.A., Lami S.J., Usman B.L., Christiana T.A.K., & Halima M.K. (2014). Why popularity of local beverages is soaring.

Bailey-Shaw, Y.A., Williams, L.A., Junor, G.A., Green, C. E., Hibbert, S.L., Salmon, C.N. & Smith, A.M. (2008). Changes in the contents of oleoresin & pungent bioactive principles of Jamaican ginger (*Zingiber officinale Roscoe*) during maturation. *J Agric Food Chem*., *56*(14), 5564–71.

Bentley, D.J., Dank, S., Coupl, R., Midgley, A. &Spence, I. (2012). Acute antioxidant supplementation improves endurance performance in trained athletes. *Res Sports Med*, 20, 1–12.

Chukwuma, M. (2015). Shea nut oil, turmeric, others top list of local plants for joints pains. Retrieved from www.guardian.ng 17 January 2017.

Cohen, R. J., Ek, K. & Pan, C.X. (2002). Complementary & alternative medicine use by older adults: A comparison of self-report & physician chart documentation. *J Gerontol A Biol Sci Med Sci*, *57*(4):M223–7.

El-Abhar, H.S., Hammad L.N. & Gawad, H.S. (2008). Modulating effect of ginger extract on rats with ulcerative colitis. *Journal of Ethnopharmacol*. *118*(3), 367–72.

El-Sharaky, A.S., Newairy, A.A., Kamel, M.A. & Eweda, S.M. (2009). Protective effect of ginger extract against bromobenzene-induced hepatotoxicity in male rats. *Food Chem Toxicol*., *47*(7), 1584–90.

Ferguson, P. (2014). History of Gimgerbread Men. Archived from original on 7 August 2013.

Ghayur, M.N. & Gilani, A.H. (2005). Pharmacological basis for the medicinal use of ginger in gastrointestinal disorders. *Dig Dis Sci*., *50*(10), 1889–97.

Ghayur, M. N., Gilani, A.H., Ahmed, T., Khalid, A., Nawaz, S.A., Agbedahunsi, J. M., Choudhary, M.I. & Houghton, P.J. (2008). Muscarinic, Ca (++) antagonist & specific butyrylcholinesterase inhibitory activity of dried ginger extract might explain its use in dementia. *Journal of Pharm Pharmacol*., *60*(10), 1375–83.

Ghosh, A.K. (2011). *Zingier officinale*: A natural Gold. International Journal of Pharma & Bioscience. 2 (1).

Halvorsen, B.L. (2002). A systematic screening of total antioxidants in dietary plants. *J Nutr*. *132*(3), 461–71.

Jolad, S.D., Lantz, R.C., Chen, G.J., Bates, R.B. & Timmermann, B.N. (2005). Commercially processed dry ginger (*Zingiber officinale*): Composition and effects on LPS-stimulated PGE2 production. *Phytochemistry*, *66*(13), 1614–35.

Koh, E.M., Kim, H.J. & Kim, S. (2009). Modulation of macrophage functions by compounds isolated from *Zingiber officinale*. *Planta Med*. *75*(2):148–51.

Minghetti, P., Sosa, S. & Cilurzo, F. (2007). Evaluation of the topical anti-inflammatory activity of ginger dry extracts from solutions & plasters. *Planta Med*. *73*(15), 1525–30.

Mashhadi N. S., Ghiasvad R., Askari G., Hariri M., Darvish L., & Mofid M. R. (2013). Anti-oxidative and anti-inflammatory effects of ginger in health and physical activity. Retrieved January 2017.

Matsumura M. D., Zavorsky G. S. & James M.S. (2015). The effect of pre-exercise ginger supplementation on muscle damage and delayed onset muscle soreness.

Nafiseh, S.M., Reza, G., Mitra, H., Gholamreza, A., Awat, F., Leila, D., Maryam, H. & Azam, B. (2013). Effect of Ginger & Cinnamon Intake on Oxidative Stress & Exercise Performance & Body Composition in Iranian Female Athletes. *International Journal ofPreventive Medicine*, 4(1), 31–35.

Nicoll, R., &Henein, M. Y. (2009). Ginger (*Zingibe rofficinale Roscoe*): A hot remedy for cardiovascular disease? *Int J Cardiol*. *131*(3), 408–9.

Quimby, E.L. (2007). The use of herbal therapies in paediatric oncology patients: Treating symptoms of cancer & side effects of st&ard therapies. *Journal of Pediatr Oncol Nurs*., *24*(1), 35–40.

Reginster, J. Y., Gillot, V., Bruyere, O. &Henrotin, Y. (2000). Evidence of nutriceutical effectiveness in the treatment of osteoarthritis. *Curr Rheumatol Rep*., 2(6), 472–7.

Thompson, H.J. & Potter P.J. (2006). Review: Ginger prevents 24hour postoperative nausea & vomiting. *Evid Based Nurs*. 9(3) 80.

Topic, B., Tani E., Tsiakitzis, K., Kourounakis, P.N., Dere, E., Hasenohrl, R. U., Hacker, R., Mattern, C.M. & Huston, J.P. (2002). Enhanced maze performance & reduced oxidative stress by combined extracts of *Zingiber officinale*& ginkgo biloba in the aged rat. *Neurobiol Aging*., *23*(1), 135–43.

Wu, K.L., Rayner, C.K., Chuah, S.K. (2008). Effects of ginger on gastric emptying & motility in healthy humans. *Eur Journal of Gastroenterol Hepatol 20* (5), 436–40.

Nutritionist-resource, (2017). Sport nutrition. Retrieved Febuary 20, 2017 from www.nutritinist-resource.ng.uk.

Naijabizcom, (2011). How to export ginger from Nigeria. Retrieved January 20, 2017 from www.naijabizcom.com.

Young, H.Y., Luo, Y. L., Cheng, H.Y., Hsieh, W.C., Liao, J.C. & Peng, W.H. (2005). Analgesic & anti-inflammatory activities of [6]-gingerol. *Journal of Ethnopharmacol* (*1*(2), 207–10.

CORRELATE OF SAFETY MEASURES OF OIL MARKETING COMPANIES AND SAFETY BEHAVIOURS OF FUEL STATION ATTENDANTS IN SEKONDI-TAKORADI METROPOLIS

[1]Ansah, Edward W., [2]Mintah Joseph K., & [3]Menyanu Elias K.

Dept. of Health, Physical Education and Recreation (HPER), University of Cape Coast, Cape Coast, Ghana
1E-mail: edward.ansah@ucc.edu.gh; Phone: +233 (0) 247703379,

Abstract

Workers of fuel retail industry are exposed to many hazards as result of their job and behaviors. Management's safety practices are important workplace preventive measures to reducing health and safety hazards. The purpose of this study was to explore the level of safety behaviors among pump attendants and the relationship between attendants' safety behaviors and safety measures of the companies in the Sekondi-Takoradi. This survey involved 114 pump attendants from four purposively sampled oil marketing companies. Researcher generated questionnaire with Cronbach's alpha internal consistency reliability of .81 was used to collect data, using SPSS version 16.0 with Pearson correlation as statistical tool. The results indicated that 70% of the respondents disagreed they sometimes ignore safety rules to get their work done quickly, while 86.8% disagreed they sometimes intentionally allow fuel to touch their body. Also, as 60% of the participants agreed they always change into house dresses after work, 78% agreed they always observe safety rules at their stations. Pearson bivariate correlation analysis showed that safety policy enforcement positively correlated moderately (r = 0.6) with attendants' safety behavior while a low positive relationship was observed between personal protective equipment and safety

behaviors of the attendants. The fuel attendants performed their jobs with high sense of safety. Furthermore, provision of appropriate workplace safety measures has positive relationship with the safety behaviors of the participants. Hence, instituting worksite safety policy and enforcing them will positively promote safe work performance among the attendants.

Key Words; Safety behavior, safety measures, pump attendants, health and well-being.

Introduction

Contemporary workplace health and safety issues are importance to the worker, the family, their organisation and the general society. They are not only about the health and safety of the workers, but also about promoting business, corporate image and an act of cooperate social responsibility (Hafner, van Stolk, Saunders, Krapels, & Baruch, 2015). Maintenance of appropriate worksite health and safety provides the highest standards for worker health promotion while increasing productivity. In that case, safety measures management institute become important vehicles to which worker health and safety can be improved (Ansah, & Mintah, 2012). Such measures can reliably reduce injury rates and promote the health of employees (Remawi, Bates, & Dix, 2011). Moreover, provision of appropriate safety measures improved safety procedures, reduce injury rate, illness and promote the health and well-being of workers. Evidence suggests that organisations with strong safety culture and management support for safety have high turn-over rate, low absenteeism, hospital expenses and worker compensation claims. Additionally, strong organizational safety culture promotes increased co-operation, worker confidence, productivity and corporate image of the organization (Remawi, Bates, & Dix, 2009).

Fuel service stations are hazardous working environment where attendants are exposed to harmful conditions ranging from customer abuse, armed robbery attack, and exposure to carcinogenic petroleum fumes (Ansah, & Minth, 2012). There are research indications, for instance, that repetitive and long standing work, that form attendants' routine duties, have negative influence on musculoskeletal system like low back, leg and foot pains. Such work settings are positively associated with high blood pressure (Hughes, Nelson, Matz, & Lloyd, 2011). Fuel station work at developing countries expose the attendants to acute and chronic carcinogenic petroleum compounds such as lead, benzene, toluene and high amount of sulphur (Gueniat, Harjono, Missbach, & Viredaz, 2016). These heavy metals and chemicals are grave carcinogenic and can cause various lung cancers (Attfield et al.,

2012) eye and respiratory tract irritation, skin and neurocognitive dysfunctioning (WHO, 2010). Rapid unconsciousness and death due to respiratory failure may also result from exposure to these petroleum compounds at very high concentration (Boschetto et al., 2006). Therefore, to ensure that workers are safe and healthy, management has to institute measures such as personal protective equipment (PPE), safety education and workplace safety policies (Clarke, 2008).

Workplace safety policies are regulations instituted by management (in conjunction with workers) as the first step towards promoting the health of workers. Primarily, safety regulations aim at protecting and/or promoting the health and safety of the workers (Choudhry, Fang, & Ahmed, 2008). Instituting and actively enforcing these policies also promote effective health and safety behaviors of workers. It further provides increased supervisory safety interactions in the form of regulation enforcement that could significantly increase the safety behaviors of the workers (Zohar, & Luria, 2003). Companies with workplace safety policies are more likely to have better worker safety performance than those without such policies (Boustras, & Hadjimanoli, 2012). Moreover, it been observe that firms that enforce instituted workplace safety regulations decrease compensation claims of 22.5% to 12.8% as compare to a slight increase in firms without enforcement activities (Baggs, Silverstein, & Foley, 2003). Moreover, the policies forms the bases for the formation of safety committees, providing safety training, facilities and PPE.

Workplace safety committee is a vital indicator of the importance management places on the health and safety their workers. For example, companies with safety committee are also about 1.7-2.1 times more likely to have positive worker safety records relative to those without such committees (Parker et al., 2007). On the whole, worksite safety policies promote effective worker safety behaviors and safeguard their health safety. Thus, safety committee influenced positively the safety work practices of workers including the appropriate use of PPE and safety facilities (Tsung-Chih, Chi-Wei, & Mu-Chen, 2007).

The import PPE to worker health and safety cannot be underestimated in any work environment. Availability of PPE is required to promote constant use of such devices (Strong, Thompson, Koepsell, & Meischke, 2008). The use of PPE is expected to reduce the risk of exposure to many workplace hazards and injuries (WHO, 2010). And that, workers are more likely to always wear PPE when such devices were available. Therefore, unavailability of PPE may put workers especially young workers at greater risk of exposure. Yet, combining PPE with training, strong safety culture and strong leadership skills produced the desired safe work behaviors for the well-being of workers (Lehmann et al., 2009). However, protective use of PPE will always be hampered without accompanied safety education or training (Ansah, & Mintah, 2012).

Employee safety education and training has been recognized over ages as an effective instrument for promoting worker safety behaviors (Jensen, 2005). Occupational health and safety training embodies instructing workers to recognise known hazards and assisting them to use available methods to protect themselves. This form of education gives guidance to become better informed worker that takes action(s) aimed at eliminating workplace hazards. Education positively influenced worker safety climate perception, compliance with safety procedures and accident involvement among some Ghanaian industrial workers (Gyekye, & Salminen, 2009). Besides, safety training predicted safety compliance and safety participation among industry workers in Kerala (Vinodkumar, & Bhasi, 2010). In addition, safety training correlated positively high with safety compliance and safety participation among workers. Perhaps, effectiveness of safety training is also evidence in the level of the use of provided safety facilities.

The important of safety facilities to promoting health and safety of workers has been identified since the end of the Second World War (LaDou, 2003). Provision of safety facilities enhances safety behaviors, protects and promotes the health and well-being of workers (Jensen, 2005). Workplace safety facilities are appliances,

except PPE, use by workers in their day-to-day operations. These facilities enhance the smooth operation of work and help prevent injury and ill health. For instance, provision of required safety devices and interaction with workers lead to a reduction in the number of self-reported needle stick injuries among public hospital nurses (van der Molen, Zwinderman, Sluiter, Frings-Dresen, 2011). Similarly, attitude of workers towards work and personal hygiene improved when they were provided with appropriate safety facilities. Moreover, a research suggested that engineering controls enhance compliance and reduce exposure incidents among some health care workers (Gershon et al., 2000). Thus, safety facilities are necessities if workers behaviors are to be enhanced to help preserve their health and safety.

The strategies to upscale workers' behaviors require management to institute health and safety policies, provide appropriate PPE, educate workers on workplace safety procedures and provide the necessary safety facilities (Boustras, & Hadjimanoli, 2012). There is a need to place premium on worker behavior as a key determinant of whatever good or bad that occurs to their health now or in the future. And that, workers behaviors stem mostly from the work environment (Lovato, Sabiston, Hadd, Nykiforuk, & Campbell, 2006). However, there is generally a lack of empirical literature on the level of safety behaviors among pump attendants in Ghana. Besides, no study explored the relationship between the provision of safety measures and safety behaviors among this population of workers. This study therefore, aimed to explore, the level of safety behaviors among pump attendants and the correlation between the safety measures provided by the OMCs and the safety behaviors of the attendants in the Sekondi-Takoradi Metropolis of Ghana.

Methods

This cross-sectional survey consisted of 114 conveniently selected attendants from four purposively sampled OMCs; Allied Oil (23), Ghana Oil Company (32), Shell Ghana Limited (29) and Total Petroleum Ghana (30), operating in Sekondi-Takoradi in the Western Region of Ghana.

The participants responded to a 25-item questionnaire. Part one of the questionnaire (items 1, 2, 3, 4, and 5) collected participants' background information; age, gender, educational level, number of years working at the fuel service stations, and whether shift or not. The part two was a five point Likert scale with scores of 5 strongly disagree, 4 agree, 3 no idea, 2 disagree and 1 strongly disagree. However, negative items had reverse scores. Items 6, 7, 8, and 9 measured safety policy enforcement, 10, 11, 12 and 13 provision of safety education, 14, 15, 16 and 17 safety facilities, 18, 19, 20 and 21 provision of PPE. In addition, items 22, 23, 24, and 25 measured safety behaviors of the attendants. A score below 50% indicated low and 50% or above indicated high safety behavior measure of the participants. The questionnaire yielded alpha reliability of .81. SPSS version 16 was used for data analysis.
Institutional Review Board (IRB) of the University of Cape Coast, Ghana, approved the research protocol. Authorization was obtained from the OMCs and/or managers of the service stations to survey the attendants. The attendants were contacted at their stations for their voluntary participation. Each participant signed an informed consent form before completing the survey.

Results

There were 21 (18.4%) females and 93 (81.6%) male participants. Working experience ranged from less than one to 17 years (M = 3.35; SD = 3.43). Of these participants, 73% (84) had secondary education, 11.4% (13) had vocational education, 7.9% (9) had basic education, and 7.0% (8) had tertiary education. Among this sample, 93% (106) work on 24 hour shift with just 7% (8) on 12-hour basis. The age of the participants ranged from 19 to 45 years (M = 26.3; SD = 5.74).

To determine the level of safety behaviors among the attendants, frequency and percentage distributions were calculated. The results revealed that 70.2% of the respondents either disagreed they sometimes ignore safety rules to get their work done quickly, but 23.7% agreed to this statement. On whether the attendants sometimes intentionally allowed fuel to touch their body, 86.8%

disagreed, while 11.45% agreed. In addition, while about 37% of the participants disagreed that they always change into their house dresses after work (before going home), 59.7% agreed they do so. Moreover, 21% of the participants confirmed that they do not always observe safety rules at their stations. On the contrary, 77.7% agreed they always observe safety rules at their stations. The results therefore, suggest that, majority of pump attendants in Sekondi-Takoradi Metropolis observe a high standard of safety at the fuel service stations (see Table 1 for data).

Table 1: Frequency Data Showing the Level of Safety Behaviors of Fuel Attendants

Variable	Agree f %)	No Idea f (%)	Disagree f (%)
I sometimes intentionally allow fuel to touch my body i.e. mouth, hand	13 (11.4)	2 (1.8)	99 (86.8)
I always change into my house dress before going home after work	68 (59.7)	3 (2.6)	43 (37.7)
I always observe the safety rules when working	88 (77.2)	2 (1.8)	24 (21.0)

Pearson bivariate correlation analysis was also calculated to determine the relationship between safety measures (provided by the OMCs) and the safety behaviors of the attendants. Results from Table 2 revealed that there was a positive moderate correlation (r = 0.6) between safety policy enforcement and attendants' safety behavior measure. Moreover, the correlation between PPE and safety behavior of the attendants was positively low (r = 0.4). In addition, safety facilities correlated positively low (r = 0.2) with attendants' safety behavior measure. However, a moderate inverse relationship (r = -0.5) was observed between safety education and attendants' safety behavior. Hence, generally, there is positive relationship between the safety behaviors of the attendants and safety measures, except safety education, of the OMCs in the Sekondi-Takoradi Metropolis (see Table 2 for data).

Table 2: Correlation among Safety Behaviors (SB) and Safety Measures (SPE, PPE, SE, SF)

Safety Variables	PPE	SE	SF	SB	R2
Safety Policy Enforcement (SPE)	.627	.715	.349	.594	.35
Personal Protective Equipment (PPE)		.619	.314	.386	.15
Safety Education (SE)			.400	-.541	.29
Safety Facilities (SF)				.185	.03

N = 114

Discussion

The findings of this study revealed that attendants averagely scored high on the safety behavior measure. Perhaps, the participants observed high safety procedures while at work. A probable reason being that majority of the OMCs provides average amount of safety measures at the fuel service stations. Several studies (Lovato et al., 2006; Zohar, & Luria, 2003) revealed that provision of appropriate safety measures at workplaces culminate into high safety performance of workers. Then, provision of safety facilities for these attendant would be effective in increasing some thermal injury prevention practices among them. But safety training among the workers could also increase safety compliance and safety participation as recorded among industrial workers in Kerala (Vinodkumar, & Bhasi, 2010). Thus, providing adequate safety measures do not only improve working conditions for the workers their attitudes and behaviors regarding safe work procedures are equally positively influenced.

One of the first steps towards promoting and protecting the health and well-being of workers is instituting and enforcing workplace safety policies as safe work performance of the workers is also likely to be enhanced. The argument is that increase in the regulation enforcement activities of immediate supervisors is also

key to promoting work safety practices of these attendants (Zohar, & Luria, 2003).

This study also revealed that about quarter of the attendants scored low in their safety behavior index. Perhaps, this was due to high work demand, negative attitude towards safety and inexperience of some of the participants. As observed in earlier research (Parimalam, Kamalamma, & Ganguli, 2007), probably these attendants were aware of the benefits of using PPE at work but just ignored the use of such devices. There may be an existing gap between knowledge they possess or what workers acquire and what they practice at work. This may be due to some workplace factors such as high demand of work and the quest to serve clients, which could override their sense of safety. Further factor complication the challenge may be the fact that many of the attendants are young and prone to taking risk resulting injuries. For instance, experienced and adult workers are less likely to have workplace injuries than the less experienced ones due to poor worksite safety behaviors attributed to inexperience, low or lack of knowledge about the operation guidelines and risk taking behaviors (Parimalam, Kamalamma, & Ganguli, 2007). Acquisition of knowledge by workers is also a product of safety measures provided through safety training, continuous education and provision of appropriate safety facilities (Health and Safety Executive, 2009).

Generally, the findings of this study also suggest a positive relationship between safety behavior of the attendants and safety measures of the OMCs. Safety policy enforcement contributed highest to the variance in safety behavior of the attendants. Safety policy is the panacea to all safety measures companies provide for their workers (Health and Safety Executive, 2008). There is a need to strive for a written workplace safety policy. Because this is an effective way to promoting safety behaviors of workers. Moreover, some among proportion of attendants' safety behaviors was a contribution from PPE. This finding also highlight the importance of providing and enforcing the use of PPE among workers.

Provision of appropriate PPE has been found to be a major mediator in safety behaviors of workers (Vinodkumar, & Bhasi, 2010). For example, increased PPE use was strongly associated with workplace training or education (Macfarlane, Chapman, Benke, Meaklim, Sim, & McNeil, 2008), thus, making worksite safety training an important intervention reducing behaviors counter to safety. Hence, not only should provision of PPE be paramount in the acts of protecting the health of these attendants, more importantly training them to appropriately use the devices. Therefore, provision of appropriate PPE may not necessarily be effective to increasing the attendants' safety behavior, but safety training and/or education would equally be essential contributor (Tiramani, Colosio, & Colombi, 2007).

The moderate but inverse correlation found between safety education and safety behavior of the attendants, and moderate positive correlation between safety education and PPE and safety education and safety facilities explain the knowledge gap that exist between attendants' education and behaviors. This is possible among the attendants as it was observed that apprentices often do not apply safety principles in their line of duty (Lipscomb, Dale, Kaskutas, Sherman-Voellinger, Evanoff, 2008). The positive correlation seen between safety education and the other safety measure variables (safety policy enforcement, PPE and safety facilities), underscores the importance of safety education to the contribution of workers' safety behaviors.

Conclusions and Recommendations

The nineteen percent variation in attendants' safety behavior measure was a contribution from safety facilities. Perhaps, as management supplies safety facilities such as changing room with cabinets, washroom, water with soap among others, attendants are more likely to effectively use them which safeguard their health. But, provision of essential safety facilities needs to go hand-in-hand with positive interaction that encourage workers to make positively the use of the facilities. For example, the rate of self-reported needle stick injury reduced among public hospital nurses

as result of provision of carriers and holders (van der Molen et al., 2011). Therefore, providing safety facilities without safety education would perhaps not enough to motivate attendants to take necessary actions to protect themselves and others at work.

This study indicated that pump attendants in Sekondi-Takoradi Metropolis observed quite a high standard of safety at their fuel service stations. Generally, there is positive relationship between safety behaviors of the attendants and safety measures as provided by the OMCs at these fuel service stations. In addition, safety education contributes negatively in promoting the safety behaviors of the attendants. Hence, the attendants may need to be provided with adequate safety facilities and PPE to motivate them put the knowledge acquired through workplace safety education into appropriate use. Moreover, instituting workplace safety policies and enforcing them, increasing provision of PPE, and providing adequate safety facilities would promote significantly the safety behaviors of the pump attendants.

This is the first study that explored the correlation between safety measures, as provided by OMCs and their fuel station heads, and safety behaviors of attendants in Ghana, and the Sekondi-Takoradi where oil found in the country is pushing a lot of companies. The study was done in only two big cities with purposively selected OMCs and conveniently chosen small sample of attendants. Therefore, its results, findings and conclusions cannot be said to represent the generality of Ghanaian OMCs and attendants. There is a need to replicate this study all over the country and assess safety status and needs in the downstream oil sector. To establish cause-effect relations, there is a need to do a bigger study involving many OMCs and their attendants about predictors and their paths of predicting safety behaviors.

References

Ansah, E. W., & Mintah, J. K. (2012). Safety management practices at fuel service stations in Central and Western Regions of Ghana. Nigerian Journal of Health Education, 16(1), 78-89.

Attfield, M. D., Schleiff, P. L., Lubin, J. H., Blair, A., Stewart, P. A., Vermeulen, R… Silverman, D. T. (2012). The diesel exhaust in miners study: A cohort mortality study with emphasis on lung cancer. Journal of National Cancer Institute, 104, 1-15.

Baggs, J., Silverstein, B., & Foley, M. (2003). Workplace health and safety regulations: Impact of enforcement and consultation on workers' compensation claims rates in Washington State. American Journal of Industrial Medicine, 43, 483-494.

Boschetto, P., Quintavalle, S., Miotto, D., Cascio, N. L., Zeni, E., & Mapp, C. E. (2006). Chronic obstructive pulmonary disease (COPD) and occupational exposures (Electronic version). J of Occup Med and Toxico., 1(11) doi:10.1186/1745-6673-1-11.

Boustras, G., & Hadjimanoli, A. (2012). Management of health and safety in micro enterprises in Cyprus-Survey on ergonomics. 63rd Meeting of the Senior Labour Inspectors Committee 29-30 November 2012. NICOSIA, CYPRUS.

Choudhry, R., Fang, D., & Ahmed, S. (2008). Safety management in construction: Best practices in Hong Kong. Journal of Professional Issues, Engineering Education and Practice, 134(1), 20-32.

Clarke, E. (2008). Do occupational health services really exist in Ghana? A special focus on the agricultural and informal sectors. Journal of Science and Technology, 27(3), 86-95.

Gershon, R. R. M., Karkashian, C. D., Grosch, J. W., Murphy, L. R., Escamilla-Cejudo, A., & Flanagan, A. P. (2000). Hospital safety climate and its relationship with safe

work practices and workplace exposure incidents. American Journal of Infection Control, 28(3), 211-221.

Gueniat, M., Harjono, M., Missbach, A., & Viredaz, G. V. (2016). Dirty diesel. How Swiss traders flood Africa with toxic fuels. Accra: Public Eye.

Gyekye, S. A., & Salminen, S. (2009). Educational status and organizational safety climate: Does educational attainment influence workers' perceptions of workplace safety? Safety Science, 47(1), 20-28.

Hafner, M., van Stolk, C., Saunders, C., Krapels, J., & Baruch, B. (2015). Health, well-being and productivity in the workplace: A Britain's Healthiest Company summary report. Cambridge, UK: RAND Corporation.

Health and Safety Executive. (2008). Safety in petrol filling stations. Health and Safety Executive HS (G) 146, 2008. From http:// www. colerainebc.gov.uk

Health and Safety Executive. (2009). Working alone, health and safety guidance on the risks of lone working. From http://www.hse.gov-.uk/pubns/indg

Hughes, N. L., Nelson, A., Matz, M. W., & Lloyd, L. (2011). Safe patient handling and movement series: Solutions for prolonged standing in perioperative settings. AORN Journal, 93, 167- 174.

Jensen, E. A. (2005). An assessment of safety/risk management practices/perspectives among high/middle school technology education instructors and business/industry professionals. From http://www2uwstout.edu/content/ lib/thesis/2005jense

LaDou, J, (2003). International occupational health. International Journal of Hygiene and Environmental Health, 206(4-5), 303-313.

Lehmann, C. C., Haight, J. M., & Michael, J. H. (2009). Effects of safety training on risk tolerance: An examination of male workers in the surface mining industry. Journal of Safety, Health & Environmental Research, 4(3), 1-22.

Lipscomb, H. J., Dale, A. M., Kaskutas, V., Sherman-Voellinger, R., & Evanoff, B. (2008). Challenges in residential fall

prevention: Insight from apprentice carpenters. American Journal of Industrial Medicine, 51(1), 60-68.

Lovato, C. Y., Sabiston, C. M. V., Hadd, V., Nykiforuk, C. I. J., & Campbell, H. S. The impact of school smoking policies and student perceptions of enforcement on school smoking prevalence and location of smoking. Health Education Research, 22(6), 782-793.

Macfarlane, E., Chapman, A., Benke, G., Meaklim, J., Sim, M., & McNeil, J. (2008). Training and other predictors of personal protective equipment use in Australian grain farmers using pesticides. J Occupational and Environmental Medicine, 65(2), 141-146.

Parimalam, P., Kamalamma, N., & Ganguli, A. K. (2007). Knowledge, attitude and practices related to occupational health problems among garment workers in Tamil Nadu, India. Journal of Occupational Health, 49(6), 528-534.

Parker, D., Brosseau, L., Samant, Y., Pan, W., Xi, M., & Haugan, D. (2007). A comparison of the perceptions and beliefs of workers and owners with regard to workplace safety in small metal fabrication businesses. American Journal of Industrial Medicine, 50(12), 999-1009.

Remawi, H., Bates, P., & Dix, I. (2011). The relationship between the implementation of a safety management system and the attitudes of employees towards unsafe acts in aviation. Safety Science, 49(5), 625-632.

Strong, L. L., Thompson, B., Koepsell, T. D., & Meischke, H. (2008). Factors associated with pesticide safety practices in farm workers. American Journal of Industrial Medicine, 51(1), 69-81.

Tiramani, M., Colosio, C., & Colombi, A. (2007). The impact of personal protective equipment in reducing risk for operators exposed to pesticides: From theory to practice. G Ital Med Lav Ergon, 29(3), 376-379.

Tsung-Chih, W., Chi-Wei, L., & Mu-Chen, L. (2007). Safety climate in university and college laboratories: Impact of

organizational and individual factors. Journal of Safety Research, 38(1), 91-102.

van der Molen, H. F., Zwinderman, K. A. H., Sluiter, J. K., & Frings-Dresen, M. H. W. (2011). Better effect of the use of a needle safety device in combination with an interactive workshop to prevent needle stick injuries. Safety Science, 49(8-9), 1180-86.

Vinodkumar, M. N., & Bhasi, M. (2010). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. Accident Analysis and Prevention, 42(6), 2082-93.

WHO. (2010). Preventing disease through healthy environments, exposure to benzene: A major public health concern. Public Health and Environment, World Health Organization Bulletin, 20, 12-27.

Zohar, Z., & Luria, G. (2003). The use of supervisory practices as leverage to improve safety behavior: A cross-level intervention model. Journal of Safety Research, 34(5), 567-577.

THE USE AND IMPACT OF ICT IN TEACHING AND LEARNING OF HEALTH EDUCATION IN ELEMENTARY SCHOOLS IN LAGOS STATE, NIGERIA

Blavo, Jude Femi & Oroleeye, Adesoji Adeyemi
Dept of Physical and Health Education,
Adeniran Ogunsanya College of Education, Lagos, Nigeria.
Phone +234-802-387-9964, +234-702-859-6959,
E-mail- judeblavo@yahoo.com Sports Council,
Adeniran Ogunsanya College of Education, Lagos, Nigeria.
Phone +234-812-061-6095
Email:sojioroleye@yahoo.com

Abstract

The study assessed the use and impact of Information and Communication Technology in teaching and learning of health education in elementary schools in Lagos State, Nigeria. A survey design was used for the study. The data were collected using self developed structured questionnaire, the co-variates collected in the questionnaire were: availability of ICT, adequate personnel and availability of funds, test-retest reliability co-efficient of 0.76 while purposive and stratified sampling technique was used to select the respondents and schools respectively. One thousand eight hundred and twenty six instruments were retrieved out of One thousand nine hundred and fifty distributed and statistics of mean, standard deviation and ANOVA were used to analyze the data. Results indicated that all the co-variates used in the study were significant. Showing a joint regression produced F (6.1819) = 83.188, P<0.05. Since p value is less than 0.05. Integrating information and communication technology into health Education is very.essential to improve the teaching and learning of health education in elementary schools in Lagos Nigeria.

Key words: Use, Impact, ICT, Health Education, Teaching and Learning.

Introduction

In the way and manner we tend to use technology across the globe, we may want to evaluate the usefulness of information and communication technology in an educational context, we also need to research how ICT can afford the processes of learning and what learning system can be achieved. As well, evaluating the impact of an ICT innovation in teaching and learning process is highly commendable. This gives a broad overview of issues surrounding the evaluation of the effectiveness of information and Communication Technology environment (Ayotunde, 2010). In consonance to Information and Communication Technology (ICT) media techs are used in modern schools especially schools where ICT is given priority. These tools of ICT are effectively put in place to give vivid picture, true state, and clarity of ideas of matters relating to it.

The term Information and Communication Technology (ICTs) is very popular across the globe and gradually growing in developing countries like Nigeria. However, not many assess its impact and application to enhance the quality of teaching and learning of health education in our education institutions particularly in elementary schools. Information in its real sense is an entity that arises from a set of data which has been structured and deigned toward a particular audience upon which vital decisions may be made. More so, it also refers to as a processes data with a purpose. In his view, Adedoyin (2007) opined that information is the exchange of data between or among individuals or organizations. He further stated that, it is the process through which information, knowledge, ideas or messages are conveyed or transmitted from one source to another. It is also a way of human social life and it is as well impossible to be alive without communicating our existence and interaction with one another. Communication is a process of information exchange between two or more individuals in an attempt by an individual to persuade or influence the behaviour of the other individual.

The teaching of health education in elementary schools exposes and increase teachers' experience which in turn assists pupils to attain valuable and sound ethics which encourages in harnessing

healthy decisions and determination in future. (Adebare, 2012). However, the confidence and professionalism of teachers has been undermined and this has resulted in avoidance of their exercise. Research shows that generally there is little reference to many health education lesson and teachers (Ganthon, 2012).

Moreover, as important as the teaching of health education is in elementary school, so also is the use of Information and Communication Technology (ICT) amongst pupils in these schools stir up a great interest to the teaching and learning of health education. In this presents time teaching and learning of any subject must be encouraged with the introduction and use of Information and Communication Technology gadgets which cannot be over emphasized. Its usage has gone viral than expected. Teaching and learning in the 21st century is not complete without making use of information and communication technology as a tool.

Health education is an important aspect of learning that cannot be substituted for other subject, especially in elementary schools. Health education in the elementary schools is the basis of acquiring knowledge and ideas about the health of an individual and the environment. However, the elementary school set-up consists mainly of pupils who are less knowledgeable about human health. According to Michael (2010) stated that, the impact and effectiveness of health education can never be traced for anything whatsoever; this is because the health of an individual's is paramount to his or her well being.

In his view, Adekunle (2012) stated that Instructional materials, information and communication technology (ICT) encompasses a broad range of technologies that complement the classroom learning environment and can dramatically increase a pupil's access to quick and updated information which is very vital. The question to "Know" "how much" or "how many" has always been an eloquent task that is yet to be answered. He further stated that the earliest report shows people whom has quickly developed methods of one-to-one correspondence to help them communicate about members and objects.

The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy (Rosen and Well, 1995; and Thierer, 2000). Most experts in the field of education agreed that, when properly used, information and communication technology hold great promise to improve teaching and learning in addition to shaping workforce opportunities. There is no doubt that computer can aid the instructional process and facilitate students' learning. Many studies have found positive effect associated with technology aided instruction (Burnett, 1994, and Fitzgerald and Warner, 1996).Nigeria does not only lack information infrastructure, it also lacked the human skills and knowledge to fully integrate ICT into secondary education. To use information and communication technology (ICT) in secondary schools in Nigeria, the need for locally trained workers to install, maintain and support these systems cannot be over emphasized.

In Nigeria also, most secondary school teachers lack the skills to fully utilize technology in curriculum implementation hence the traditional chalk and duster approach still dominates in secondary school pedagogy. Information transfer using ICT is minimal or non-existence in secondary schools in Nigeria (Anao, 2003). Secondary school teachers in Nigeria need to be trained on educational technologies and the integration of computers into classroom teaching. According to Carlson and Firpo (2001), "teachers need effective tools, techniques, and assistance that can help them develop computer based projects and activities especially designed to raise the level of teaching in required subjects and improve student learning.

The price of computer hardware and software continues to drop in most developed countries, but in developing countries, such as Nigeria, the cost of computers is several times more expensive. The importance of ICT is quite evidence from the educational perspective. Though the chalkboard, textbooks, radio/television and film have been used for educational purpose over the years, none has quite impacted on the educational process like the computer.

While television and film impact only on the audiovisual faculties of users, the computer is capable of activating the senses of sight, hearing and touch of the users. ICT has the capacity to provide higher interactive potential for users to develop their individual, intellectual and creative ability. The main purpose of ICT use"consists just in the development of human mental resources, which allow people to both successfully apply the existing knowledge and produce new knowledge" (Shavinina, 2001,).

Research Hypothesis

The following hypotheses were tested:

There is no significant use and impact of Information and Communication Technology in teaching and learning of health education in elementary schools in Lagos State, Nigeria There is no significant availability of Information and Communication Technology gadgets in teaching and learning of health education in elementary schools in Lagos State, Nigeria There is no significant effect of adequate personnel in teaching and learning of health education in elementary schools in Lagos State, Nigeria.There is no significant availability of funds for the teaching and learning of health education in elementary schools in Lagos State, Nigeria

Methodology

Sample and Instrumentation

The descriptive survey design was used for the study; the population comprised 1826 teachers of Elementary schools in Lagos State Nigeria. The instrument used for the study was a self developed structured questionnaire validated by experts in the field of Health Promotion and Educational Evaluation. The instrument was pre-tested using 50 elementary school teachers in Ogun state, Nigeria

Data Collection and Analysis

The instrument was personally administered on the respondents by the researchers, using some of the teachers as research assisstants. 1950 questionnaires were administered using purposive sampling

technique to select the respondents and stratified technique to select the schools; the questionnaire had a brief introduction on it which included the consent of the respondents to allow them respond and understand the essence of the study. The instrument was collected and collated and it was observed that only 1826 can be used for further analysis. The shortage was due to respondents' mortality or those instruments that were not properly filled. Data were analyzed using mean, std deviation and ANOVA.

Table 1: Showing the overall response of sampling (mean) from teachers in different elementary Schools in Lagos State

Variables	Mean	Std Deviation	N
Use and Impact	3.7514	.7339	1826
Availability of ICT	3.5323	.9347	1826
Adequate Personnel	9.5520	.7048	1826
Availability of Funds	1.1172	.6062	1826

Table one above shows that 1826 respondents answered the instrument, After collecting the data from the respondents, the analysis was carried out and it was observed that usage and impact of ICT as a dependent variable is 3.75144, and regarding to this variable respondent deviate from their mean equal to 0.7339, this shows that the respondents agree that usage of ICT brings a positive impact on the teaching and learning of Health education in elementary schools thus helping to improve their knowledge and skills in the delivery of their duties.

Adequate Personnel as an independent variable is 9.5520 and regarding to this variable respondents deviate from a mean equal to 0.7048 this indicates that most of the schools lack professionally trained personnel to handle the installation and maintenance of these ICT gadgets while it was also observed that most personnel for health education were inadequate to take on the subject efficiently using modern Technology. The few personnel on

ground believe that the use of ICT provides information to operate different devices and help to produce the productive knowledge that related to current studies, they are also agree that ICT in education sector provides knowledge that is helpful at the professional level.

Availability of funds for the procurement of ICT as an independent variable is 1.1172 and regarding to this variable respondents deviate from a mean equal to 0.6062. This result shows that there are no funds for the purchase of ICT gadgets which often bring about inadequacies in teaching and learning. More so, there is the need for the purchase of Equipped ICT lab, internet in computer lab, use of multimedia during teaching as well as digital computer laboratory for the effective teaching and learning of Health Education.

Table 2: Correlation of variables

Variables	Use and Impact	Availability of ICT	Adequate Personnel	Availability of Funds
Use and Impact	1.000	.876	.894	.567
Availability of ICT	.876	1.000	.543	.136
Adequate Personnel	.894	.543	1.000	.631
Availability of Funds	.567	.136	.631	1.000

Table 2 above shows the inter dependence of variables on each other. Table shows lot of relationship between all the variables, availability of ICT and its usage and also its impact in Health education. More so, there was a correlation which indicates the use of ICT as 0.894 which indicates a change recorded in its use and impact. It was also observed that there was a good relationship with in availability of fund and usage and impact which indicates 0.567 with adequate personnel indicating a relationship of 0.631.

Table3: ANOVA showing joint effects of Variables

Source of Variance	Sum of Squares	df	Mean Square	F	Sig
Regression	84968.181	6	14161.364	83.188	.000

R= 0.464
R square = 0.215
Adjusted R square = 0.213

Table 3 shows that the joint effects co-efficient R between use and impact of ICT on other variables is 0.464. Estimated R square equals 0.215 while Adjusted R square equals 0.213. This simply means that the Use and Impact of ICT when taken together accounts for 22 percent variation in the teaching and learning of Health education in elementary schools. Further investigation on the joint effect regression produced F (6.1819) = 83.188, P<0.05. Since P value is less than 0.05, the null hypothesis is therefore rejected.

Table 4: Showing relative coefficients of variables

Variable	Unstandardized Coefficient		Standardized Coefficient	t	Sig
	B	Std Error	B		
Use and Impact	0.315	.063	.113	4.958	.000
Availability of ICT	2.788E-02	.145	.005	2.193	.847
Adequate Personnel	-1.320	.207	-232	-4.370	.000
Availability of Funds	1.543	.147	.395	10.522	.000

Table 4 shows the efficiency of Independent Variables with Dependent variable. The value of‘t’ for first independent variable i.e. Availability of ICT is 2.193 which shows that it is a very efficient variable. Also the value of ‘t’ for Adequate Personnel is -4.370 which shows its less efficient this indicates that if there are

available ICT gadgets then excess personnel may not be required thus promoting the teaching and learning of Health Education in elementary schools efficiently. Now the value of't' for Availability of funds is 10.522 which shows that it is a more efficient variable which is highly needed for the stability of the other variables which encompasses purchase and maintenance

Discussion

According to the findings in the study, it revealed that the availability and usage of ICT Gadgets has a significant use in the teaching and learning of health education in elementary schools which will enhance acquisition of knowledge, the results also indicates that it will improve the capacity and programme delivery of Health education teachers. The result is in line with the study of Wasif Nisar, Ehsan Ullah Munir and Shafqat Ali Shad (2011) who observed that availability and usage of ICT is very essential to improve the educational efficiency of students, they further stated that the availability of ICT in Education is supportive for the students to improve their learning skills as well as helps utilize latest technologies of ICT which are helpful for the students to better prepare their assignments and projects.

According to Ayodele (2012), he posits that information and communication technology cannot be over emphasized in today's teaching and learning especially in health education. Consequently, Ganthon (2012) supports this assertion when he claims that the era of theoretical basis of teaching health education is over, the world has been digitalized and health education is not left behind. More so, it was observed that despite the importance of Personnel, that available ICT gadget will help students develop themselves and it will promote their ability of self development and academic prowess. Going by the findings of this study,

Aduwa-Ogiegbaen and Iyamu (2005) citing Thomas (1987) stated that Today, computers perform a host of functions in teaching and learning as many nations are adding computer literacy, reading and writing literacy as skills students will need for succeeding in a technologically developed world .

Considering the findings concerning the availability of funds, it was observed that there is the need for the funding of ICT gadgets in schools which can enhance the interest of both the learner and the teachers in the area of Health education. The result is in line with the write up of Aduwa-Ogiegbaen and Iyamu (2005) who obderved that the price of computer hardware and software continues to drop in most developed countries, but in developing countries, such as Nigeria, the cost of computers is several times more expensive. While a personal computer may cost less than a month's wages in the United States, the average Nigeria worker may require a savings of about a year' income to buy one.

Conclusion

There is no doubt that teachers and students in schools in Nigeria will have incredible resources available if they have access to modern ICT gadgets. By integrating information and communication technology into health Education, thus the availability and usage of ICT is very essential to improve the teaching and learning of health education in elementary schools in Lagos Nigeria.

Recommendations

Based on the outcome of the study, the following recommendations were made:

There is the need for Government to provide adequate funds for the purchase of ICT gadgets and needed software equipment that will enhance and promote the teaching of Health education among students, thereby eliminating future spending on Health facilities.

Non Governmental organizations should come to the aid of these schools by supplying and helping out with some needed ICT gadget that can enhance students learning of Health education.

There is the need for the recruitment of adequate personnel for the handling of the ICT gadgets when provided and more so, such personnel should be trained and retrained for the handling and maintenance of such gadgets.

References

Adebare, P.P. (2012) A Handbook on ICT and its Application, Ilorin, Published by Deoti Publising Ventures.

Adebola, R.O. (2010) Essence of using computer gadgets to teach children in Nigeria. Journal of Cultural Education 6 (2) 56-62.

Adedoyin, S.T. (2007) Enhancing classroom knowledge in Teaching and Learning Process. Journal of Education and Technology 8 (3) 112-117

Aduwa-Ogiegbaen, S. E., & Iyamu, E. O. S. (2005). Using Information and Communication Technology in Secondary Schools in Nigeria: Problems and Prospects. Educational Technology & Society, 8 (1), 104-112.

Anao, A. R. (2003). Society, knowledge incubation and management - Lagos. The Guardian Newspapers, November 11, 75.

Burnett, G. (1994). Technology as a tool for urban classrooms. ERIC/CUE Digest, 95, New York: Eric Clearing house on Urban Education, from http://www.ericdigests.org/1994/tool.htm.

Carlson, S., & Firpo, J. (2001) Integrating computers into teaching: Findings from a 3-year program in 20 developing countries. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 85-114.

Fitzgerald, G., & Werner, J. (1996). The use of the computer to support cognitive behavioural interventions for students with behavioural disorders. Journal of Computing in Childhood Education, 7, 127-48.

Ganthon,M .G.(2012) Technology and Science Education: An antidote to academic boredom. Journal of Education and Technology 8 (3) 87-91

Okebukola, P. (1997). Old, new and current technology in education. UNESCO Africa, 14 (15), 7-18.

Shavinina, L. V. (2001). A new generation of educational multimedia: High intellectual and creative educational multimedia technologies. In L. R Vandervert, L. V. Shavinina & R. A. Cornell (Eds.), Cyber education: The future of Distance Learning. Larchmont, NY: Mary Ann Liebert, Inc, 63-82.

Thierer, A. (2000). Divided over the digital divide, Washington, DC: Heritage Foundation.

Thomas, R. M. (1987). Computer technology: An example of decision-making in technology transfer. In R. M. Thomas & V. N. Kobayashi (Eds.), Educational technology: its creation, development and cross-cultural transfer, Oxford: Pergamon Press, 25-34.

Tondeur, J., M. Valcke and J. Van Braak, 2008. A multidimensional approach to determinants of computer use in primary education: teacher and school characteristics; Journal of Computer Assisted Learning.

Wasif Nisar,M, Ehsan Ullah Munir and Shafqat Ali shad(2011) Usage and Impact of ICT in Education Sector; A Study of Pakistan. Australian Journal of Basic and Applied Sciences, 5(12): 578-583, 2011

IMPEDIMENTS TO EFFECTIVE IMPLEMENTATION OF SPORTS POLICY IN NIGERIA SCHOOLS

Dr A.A.O. MUMUNNI & ADELAKUN KAYODE (Ph.D)
Department of Curriculum Studies and Educational Technology
Faculty of Education
University of Port-Harcourt
Rivers State, Nigeria

Department of Physical and Health Education
Federal College of Education (Technical)
Omoku, Rivers State, Nigeria
08035005830
jakpub@yahoo.com

Abstract

A policy remains a mere intention if it is not implemented. Non-implementation policy is a serious problem in Nigeria. There is always a wide gap between policy formulation and policy implementation in Nigeria. What is written is not always what is practiced. This paper presents a theoretical review of barriers to effective implementation of sports policies in schools. This paper looked at1989 and 2009 Nigeria Sports Policy as they affect schools' sports. It observed that the laudable policies have not been effectively implemented because of some government and institutional factors which reduce government policy on sport to a mere paper work. Some impediments to sports and physical education policy implementation in schools in Nigeria were examined. Some of the barriers highlighted in the paper included lack of collaboration between Ministry of sports and Ministry of Education; corruption, treatment of sport as a marginal programme in the school curriculum and many others. The paper recommended adequate funding of schools sports and suggested

the need for effective collaboration between Ministries of Education and Sports at Federal and State levels.

Keywords: Implementation, sport policy, physical education, collaboration, impediments

Introduction

A policy is a written or an unwritten plan of actions to achieve a predetermined goal by an individuals or groups of people. It is a selected, planned line of conduct in the line of which individual decisions are made and co-ordination achieved, (Webster Dictionary, 2004). Mkpandiok (2006) defined policy as an explicit or implicit decisions or group of decisions which may set out directives for guiding
future decisions or initiate, sustain, or retard action, or guide the implementation of previous decision. The National Sports Policy in Nigeria is a document of the Federal Republic of Nigeria, which contains statement of intentions of the federal government about sports and the envisaged means of achieving them. It is a document which spelt out in clear terms the basic philosophy, objectives, structure of sports and various obligations of the three tiers of government (Federal, State and Local Government) as well as various strategies to accomplish its aims. The document clearly articulates the values of sports in schools and in the general education process and what is expected of schools in the total development of a child from primary school to the university. The policy as it affects schools is directed towards increasing the quality of life of students as well as providing avenue for discovery of sport talents who could project the image of Nigeria in the world of sports.

One thing is to have a sport policy, another thing is to implement it. To implement means, to fulfill, to accomplish, to complete, to execute, to realize etc. It is the process of accomplishing the desired goal as stated in the policy. Implementation is at the other end of policy formulation continuum. Okoh (1993) contended that both policy and practice (implementation) must be closely related, otherwise one makes a mockery of the other. A policy that is not implemented is just a dream without effect. Implementation could be a state of having achieved the goal of a policy (as a noun). It could also mean a process of achieving a policy (as a verb).

Therefore implementation is a complex and dynamic concept. Van Meter and Van Horn cited by Brynard (2005) stated that policy implementation encompasses those actions by public or private individuals that are directed at the achievement of objectives set forth in prior policy decisions. Policy implementation is the accomplishment of policy objectives through the planning and programming of operations and projects so that agreed upon outcomes and desired impacts are achieved.

Generally, sports and physical education programmes in schools are marginally treated. This often lead to poor implementation of sports in schools. Hardman (2010) reported that globally, there is a gap between 'hope and happening', a gap between the 'promise and reality in schools because policy and practice regarding physical education and sport implementation do not add up. In Nigeria, the situation seems to be worse than the global standard. There is a wide gap between policy formulation and policy implementation almost in all sectors. This is more clearly seen in the implementation of sport policy as it affects schools from primary schools to the university. An in-depth look at various policies regarding sports in schools will reveal well-crafted and well-intentioned policies, but there is no correlation between what is written and what is practiced in school sports. There is always no sincere intention to implement brilliant sport policies, some of which may seem over-ambitious policy statements. Perhaps Nigeria inherited this deception and non-implementation of policies from her British colonialists, because long ago, Ikejiani (1964) lamented at non-implementation of policies in Nigeria when he stated:

> …any policy statement remains a paper policy until translated into action leading toward the realization of the stated aims. It is a practice of colonial powers to hold out plausible statement objectives aimed at softening criticism and gaining moral support of other nations… Our greatest quarrel with colonial education is the hiatus between policy statements and their implementation. p11

However, Nigeria cannot continue to hold her colonialists responsible for non-implementation of policies six decades after her independence from the colonial power. Even though successive policy makers make reference to pre-independence era, fifty years is more than enough to change the 'policy' of non-implementation of policies. Why can't Nigeria implement the sport policy which she drafted? It is with this background that this paper was developed.

Brief Historical Evolution of Sport and Physical Education Policies in Schools.

Sport had been part of life of Nigerians before the advent of Europeans. This is exemplified in various traditional festivals and recreational activities of Nigerians. Wrestling, swimming, ayo game, canoeing just to mention but a few traditional sports were enjoyed by the indigenous people of Nigeria. Young children were taught various traditional sports by their elders and through association or spectatorship. This made the culture of traditional sport to be passed down from generation to generation. Although there were no written policies, the practice of sport that time had specific purposes procedures and times for carrying them out. This practice continued till colonialists introduced international sports like soccer, badminton, gymnastics cricket etc.

With the introduction of formal education and foreign sports, physical exercises (education) and sports were introduced to school system in no distant time. The enactment of 1887 ordinance saw to the expansion of many subjects in the school curriculum. Hence physical drill became part of the school curriculum in Lagos colony. As a matter of policy, the strict and rigid subject was taught by a 'specialist'. Taiwo (1980) reported that:

> Physical drill was of military type. The lessons were given in Lagos schools on a weekly round by a Hausa trooper.$_{p22}$

This shows that Physical education as it is known today was taught in schools before 1890, and as a matter of government policy, it was taught by 'teachers' with special knowledge or training in the subject area but without any pedagogical training. The 1908 Southern Protectorate Education Ordinance (law/policy) listed physical exercise as optional subject to be taught to boys and girls in primary and secondary schools (Taiwo, 1980). Even though the 1908 ordinance made physical exercises an optional subject in primary and secondary schools, the ordinance set the standard for the teaching of physical exercises. It made teaching and learning of hygiene and sanitation (now Health education) compulsory in primary and secondary school. It also made physical exercises to find its way into the curriculum of teacher training colleges. The 1908 Ordinance can be said to be the beginning of an era for the policy on education that directly affected the teaching and learning of physical education and sport in primary and secondary schools as well as teacher training colleges. To buttress this claim, the National Sports Policy of Nigeria, FRN (2009) traced the origin of sport organization when it stated that:

> Formal sports organization started in Nigeria at about 1910 with the introduction of Empire Day competitions, which were organized on inter-school basis. The establishment of Mission schools in different parts of Nigeria assisted in the development of sports and the introduction of new ones. Though most of the sports were alien to Nigerians, they were welcomed because they served the common goal of recreation, entertainment, social mobilization and promotion of unity in diversity.p1

With the claims on the origin of organized sports in schools, one can rightly say that the 1908 Ordinance paved the way for organized sports competitions in Nigeria, because prior to the time the Ordinance was enacted there was no record of organized inter-school sport.

The Phelps-Stokes Commission Reports and The 1925 Memorandum on Education Policy in British Tropical Africa, which Adesina (1988) referred to as the first comprehensive statement of the colonial government policy on African education also integrated physical education into the nation's education policy. One of the recommendations of Phelps-Stokes Commission was made clearer in the report of Fajana (1978):

> …many important recommendations were made. One of them was that health, sound recreation, character development, physical education should form part of education of the masses P136

The meticulous recommendations of Phelps-Stoke Commission formed the bulk of Education policy or Ordinance of 1926. This Ordinance streamlined the course of Nigeria's educational development and school sport in particular till the eve of political independence.

In the post-independence era, physical education and sport policy in schools rely on the National Policy on Education as well as international standards as seen in Continental and Global Charters in which Nigeria is a signatory. For instance, The United Nations Educational, Scientific and Cultural Organisation (UNESCO) International Charter of Physical Education and Sports of 1978 made far-reaching statement of beliefs and recommendations on what physical education and sports should be in schools. These recommendations and statements of beliefs from UNESCO formed the bedrock of sport policy for Nigeria especially as it affects schools.

Overview of 2009 National Sport Policy as it Affects Schools' Sports

The 2009 National Sport Policy of Nigeria is a 25-page document of the Federal Republic of Nigeria, which spells out in clear and unequivocal terms, the philosophy that underlines government investment in sports as well as various strategies to accomplish its purposes. The document clarifies Federal Government philosophy and principal objectives which guides its own initiatives in matters of sports. In the first edition of the policy, which was released in 1989 with the title- Sport Development Policy for Nigeria, FRN (1989) stated that 'the provision of this document is intended to provide the national framework for the formulation and coordination of sport programmes, and to guide government actions at State and Local Government levels as far as the matter of sport is concerned'. The document can be described as the testament of Nigeria sport, which makes sports to reflect the overall interest of all Nigerians irrespective of age or social background. The National Sport Policy covers diverse areas such as sport and security, environment, international relations, culture and tourism and many others. Part of the interest of this paper is how the policy affects school sport. There are many sub-sections that affect schools sports in the policy. However, one of the major elements of the policy is Sport in education. A brief analysis of how the 2009 National Sports Policy directly affects school sport is presented below:

Parts of section two (2.5m&n) of the policy states that The National Sports Policy shall seek to (m) promote school and institutional sport development and competitions at all three tiers of government and (n) ensures that sport is an integral part of the curriculum of educational institution at all levels (nursery, primary, secondary and tertiary).These two objectives form parts of the general objectives of the national policy. It presented the role of government at all levels in integrating sports into school system. It emphasizes the need to develop sport in all educational institutions from primary schools to university level.

Besides, since education is on the concurrent list in the Constitution of the Federal Republic of Nigeria, Federal, State and Local governments are involved in establishing and financing educational institutions, therefore each tier of government must ensure inclusion and development of sports in schools under their jurisdiction. This must also include organization of sports competitions among schools.

The Policy clearly highlights the obligations of the three tiers of government to school sport in section 3. The document stated that the Federal Government through the National Sports Commission (NSC) shall collaborate with the Federal Ministry of Education on matters of schools' sports. It further stated in Section 3.2.2 (ii &viii) that The State Government through their supervisory agencies shall encourage development of physical education and sports in schools; and collaborate with the State Ministry of Education on matters of schools' sports. These policy statements for States were also repeated for Local Government in sections 3.2.3 (iii&viii) respectively. These sub-sections placed emphasis on collaboration among departments in other Ministries. Ministry of Sports cannot work in isolation if it must achieve its broad goal. It must work together with the Ministry of Education under which a very large population of youths could be found. Apart from this, if sports talents were to be found and developed, Ministry of sports must focus on schools.

The document also provides more far reaching statements in chapter four on schools' sports. In fact, a full section of the chapter was devoted to sport in education. Section 4.4(b) states that Government shall ensure availability of sporting facilities in schools. The burden of athletes' identification for the country was placed on schools. Section 4.5 of the document states that Government shall put in place sports competition programmes at the National, State and Local Government levels that will facilitate identification of young and budding talented athletes. The sports competition programmes shall include Primary schools sports competitions; secondary schools sports competitions; Annual Inter-House Sports competitions for primary schools;

Annual Inter-House Sports competitions for secondary schools; intra-zonal annual sports competitions for primary schools; Intra-zonal annual sports competitions for secondary schools; inter-zonal schools sports competitions; inter-state schools sports competitions and institutional/collegiate sports competitions. These show that government recognizes the need for intra and extra-mural sports competitions in schools. If Nigeria is to truly discover talented athletes early enough, the hunting game must start from schools.

Furthermore, the policy sees sport as an integral part of the formal system of education, which should be part of the school curriculum from nursery school to university level. This is clearly stated in section 4 sub-section 6 of the document. Section 4.6.1 stated that in order to have an all-round development of youth, sport shall be offered as compulsory subjects at the nursery, primary and secondary school levels of the formal education system. Apart from this, the policy further stated that all primary and secondary schools must have play grounds for sports as a condition for approval for their establishment, and no pupil or students (including those in tertiary institutions) shall suffer any penalty or discrimination for participating in sport. The policy directs all schools to establish a structured sporting programme which covers every student except those exempted on medical grounds; and finally, section 4.6.5 of the policy stated that any student studying in any higher institution of learning shall offer a minimum of a 4-credit unit course in sports.

These are laudable policy statements on schools' sports. It is an all-encompassing policy which caters for primary school pupils secondary and tertiary institution students. The policy if implemented would have had positive effects on sport development in Nigeria and strategically situates Nigeria among the top ranking sporting nations of the world. However, the question is, are these policy statements realizable? The answer is Yes. Are we realizing them? The answer is emphatic NO, the policy as it affects schools is far from being realized. There is a wide gap between the expected and the observed.

National Sport Policy and the Present State of Sporting Programme in Nigeria Schools

A careful analysis of each statement of the national sport policy as it affects schools' sports reveals good intention on the part of the government and the policy formulators. Each of the items portrays an ideal situation of what is expected of government at all levels and schools. However, in the real sense, what is obtainable or observed in various schools at all levels is different from what is expected. The National Sports policy seems to be on its own without any serious efforts made on the part of the government to implement it.

Although, the policy expects sports to be an integral part of the school curriculum from nursery school to higher institution, this is not currently being practice. Many schools do not engage their students in sports for various reasons ranging from lack of sports facilities and equipment to non-availability of competent teachers to handle physical education and sports in schools. Apart from primary schools where pupils offer all subjects in the curriculum in which physical education is one, at no level is physical education or sport compulsory in the Nigeria educational system. Inter- house sport programme has become a thing of the past in many primary and secondary schools. Inter-State schools' sports competitions are almost forgotten. Many higher institutions in Nigeria do not encourage participation in sports. Many institutions do not regularly participate in inter-collegiate sporting competitions like Nigeria Universities Games (NUGA), Nigeria Polytechnics Games (NIPOGA), Nigeria Colleges of Education Games (NICEGA) etc. The policy statement which directs all students in any higher institution to offer a minimum of a 4-credit unit course in sports (human kinetics) is not enforced in higher institutions in Nigeria. In Colleges of Education, physical education (sport education) is not offered by all students except those students in Primary Education studies and those studying physical and health education. In polytechnics, the situation is not different as physical (sport) education is not part of the general studies curriculum.

Very few universities in Nigeria offer physical (sport) education as part of their general studies in year one and two. When this situation is compare to what is happening in some other countries of the world, one will notice a wide gap. For instance, Laker (2000) stated that many degree programmes in the United States of America require students to take some physical (sport) education courses, while compulsory physical education in England and Wales ends at 16. In China, sport education is highly regarded in the school curriculum from primary school through university. In fact, to gain admission into a university in China, a candidate must have attained a certain level of competency in sport. Jones (1999) stated:

> … to be allocated a place at university, sport has a place that is quite unlike Britain, because sporting ability is formally used in the selection process for university entrance. A gold medal in the Olympic Games gives access to any university in the subject of choice of the student, whilst in lower competition there is a well-defined range of sport performances or ranking for which students are awarded number of points in the State examination, thus enhancing their chances of gaining a university place. To gain these rankings, students must achieve the required standard in an 'official' competition at city level or above.

This shows that sport is at the heart of school curricula in some countries of the world. Concessional admission is given to candidates who excel in sports in China and some other parts of the world.

Contrary to what is stated in the policy, many primary and secondary schools do not have play grounds before approval. The situation is worse in private schools where proprietors do not have any regard for government policies but they always have their ways.

Barriers to Effective Implementation of Sport Policy in Schools in Nigeria.

Experience has shown that Nigeria government is good at writing policies, but very weak in implementing those brilliantly crafted policies. Generally, many reasons could be adduced for non or weak-implementation of policies in Nigeria. The impediments to implementation of policies in general, also account for non-implementation of policy on schools' sports in Nigeria.

In a study conducted in South Africa, Brynard (2005) noted the gap between policy and implementation:

> The discrepancies between policy and implementation are largely caused by unrealistic policies and a lack of managerial expertise. Another key finding is that policy implementation has suffered from people driven process. Insufficient coordination of policy implementation is cited virtually in all sectors, and has significantly hampered the implementation policies. In addition, insufficient staffing and capacity of all the three spheres of government as well as the linkages between them have largely worked against the successful implementation of policies.

In a simple language, over-ambitious policy may be difficult, if not impossible to realize. Also when there are no competent or qualified people to implement a policy, the policy will either be haphazardly implemented or not implemented at all. Before a policy is formulated, there must be both human and material resources to implement it.

In another view, Hargrove (1981) identified problems that always lead to policy-implementation failure when he stated that:

> The chief cause of implementation failure is corruption… corruption has local roots and is not

> usually depicted as a national problem unless it is very wide spread. The implementation problem comes in two forms: either funds are so directed to private purposes that public goals are disregarded or the controversy over corruption kills the programme, but corruption is usually localized. National policies are brought into question only if corruption appears to be endemic in the program.

To Hargrove, corruption is the bane of policy implementation. When money that is meant for sports is diverted to private pockets or diverted to perceived areas of urgent needs other than schools sports, the resultant effect will be non-implementation of policy as it affects schools' sports. Corruption has been institutionalized in all facets of life in Nigeria and the educational sector is not immune from this. From the messengers or clerks in educational institutions to the Head or Chief Executive Officers in whatever names in educational institutions, inspectorate divisions and other offices that are concerned with running of schools, stealing and kickbacks are norms. Money that is meant to purchase sport equipment, organize sports competitions or to re-train sport officers or coaches are often mismanaged or out-rightly stolen without any trace. This is affecting implementation of sports in schools. While the findings and opinion of Brynard (2005) and Hargrove (1981) are cogent and applicable to Nigeria situation, there are more convincing barriers to implementation of Nigeria Sport Policy as it affects schools sports.

Frequent changes of government have made sport policy difficult to implement. Lack of continuity in government is an obstacle to implementation. Each successive comes with a new idea about that will take a long period of time to realize. A new government would want to start afresh instead of continuing from where the old government stopped. People in government often do this because of corruption. They believe that it would be difficult to have a "bite of the national cake" if they continued from where the previous government stopped.

Also, to a large extent government always pay lip-service to established policies. In other words when policy are written, there is no political will to translate policy statement to reality. Hence, government at all levels see policy statements on sport as just another paper work without any commitment to make it a reality. In addition FRN (2009) noted that the oscillation of the administration of sport between the Federal Ministry of Sports and the National sport Commission was a major factor militating against the desired growth and development of sport in Nigeria.

Lack of collaboration between Ministry of Education, which has statutory responsibilities on schools and the Ministry of Sport, which has ultimate benefit in getting young and budding sports talents from schools if the Ministry of Education gets it right is another impediment. There is no collaboration between the two Ministries. The Ministry of Education dictates what happens to sports in schools. If the Ministry does not see any need for school sport in a particular year, then nothing would be done. It is the Ministry of Education that employs physical educators and sport coaches for schools and pays their bills and it is said that he who pays the pipers dictates the tune. It is the Ministry of Education that constructs sports facilities and purchases sport equipment for schools. It is the Ministry that dictates the period and time limit for sports in schools. The Ministry is often overwhelmed with many responsibilities that most times the aspect of schools' sports is neglected. Sometimes because of inadequate financial resources, money that is meant for schools sport is often diverted to other areas of needs like purchase of reagents and other laboratory equipment. in all of these, Ministry of Sports has nothing to do in schools. If there were collaboration between the two Ministries, one could employ and pay physical educators and coaches while the other could purchase and supply equipment to schools and construct sports facilities where necessary.

The 1989 sport development policy for Nigeria, FRN (1989) recognized the need for collaboration between the Ministry of Sports and other Ministry. It states that for maximum effect in sports programme formulation and implementation, the Sport

Ministry is required to collaborate with department in other Ministries. In order to facilitate such collaboration, sport Ministry is expected establish a standing Inter-Ministerial programme Committee with each of these other Ministries, with which it may have cause to collaborate on a relatively frequent and stable basis. Furthermore, the guidelines for implementation of the sports development policy for Nigeria, FRN (1989) stated that " as the majority of youths are within the school system, there is need for the Ministries of Youth and Sports and Education to work in concert towards the provision of sports facilities in schools, colleges, polytechnics and universities" This means that the policy itself recognized the need for collaboration for effective implementation of sports policy in schools, but this has not been the practice, everything about schools sports is the responsibility of the Ministry of Education. As a result of this, there is a wide gap between policy formulation and implementation about schools' sports.

Inadequate financial resource for education is another barrier to effective implementation of policy on schools' sports. Governments over the years have proved to be unwilling to back its intention through policy framework with adequate budgetary allocations. This has made it difficult for the Ministry of Education to provide fund to schools to organize intramural and interscholastic sporting competitions and buy sports equipment. Besides, many schools lack competent teachers to teach sports and organize sporting competitions. For instance Adelakun (2014) discovered that 96 percent of primary schools teachers teaching physical education and sports in Imo State are not specialists in the subject, while 15 percent of teachers teaching physical education in secondary schools in Imo State are non-specialists. If there were many non-specialists without adequate sports knowledge teaching the subject, how can they effectively implement the policy on schools' sports in their domains?

Sports facilities and equipment are not adequate in schools. In fact, in many primary and secondary schools, sports facilities and equipment are not even there. The United Nation Children's Fund, UNICEF (2000) discovers that majority of schools in Nigeria lack sporting equipment and playing fields for sports. The Organization found that only 28 percent (28%) of schools in Nigeria have playing grounds, while only five percent (5%) have sporting equipment. Policies on schools sport cannot be implemented where there are no sports facilities and equipment. Ironically, sports facilities are always the first to be destroyed anytime there is a need to expand schools and build more classroom or hostels. In many schools new classrooms have been constructed at the centre of soccer pitches and athletics tracks.

Non-recognition of sport as an important element in the school curriculum by schools heads. Some school heads do not see sport as an important element in the school curriculum. They demonstrate this by converting money meant for sport to another ventures. Sometimes when money is generated through inter-house sport, schools heads often use the money to purchase science equipment or any other thing they consider more important than sport. The situation is the same in many higher institutions where Provosts in colleges of education, Rectors in Polytechnics and Vice-chancellors in universities will collect sports fees from students annually but they do not use the money to develop sports in their institutions. In addition, school heads often discourage students from engaging in sports by removing it from the time table or by not creating any time for sports on the time table., In such scenarios implementing sports policy as it affects their schools would be difficult.

Low perception about sport and marginalization of sport by the society is another impediment to effective implementation of schools sports. Parents and other members of the society often see sport as a marginal aspect of the school system. They sometimes discourage their children from participating in sport and this negates the spirit of Nigeria sport policy.

Shortage of qualified personnel in schools to implement policy is also a barrier. Qualified teachers are in short supply in schools especially in primary schools. It is either they are not employed by the ministry of education or they are not even available to be employed, although the latter could rarely be the case. In many schools where Physical education teachers are available, they are aged with limited capabilities to handle strenuous physical activitied. Besides, those physical education teachers that are available in schools are either poorly motivated or overloaded with work without additional remunerations. This often leads to low morale and poor implementation of policy on schools' sports'.

Insecurity is another constraint to effective policy implementation on school sport. Life is so cheap nowadays that it cost little or nothing to kill or maim human beings in Nigeria. In the North there is Boko Haram, in the South there are criminals who are politically called 'militants'. These groups often kidnap, rape and sometimes kill pupils and students. This sometimes makes parents to prevent their children to take part in sports especially extramural sports. In some places it is difficult for people to gather in small groups either as athletes or spectators. This is making effective implementation of sports policy difficult in such areas.

Inadequate and reliable data in schools and about schools from Ministry of Education is another barrier. To effectively plan for schools sports, data are need on the number of physical education specialists in each school, available sports facilities and equipment, number of physically challenged students, true students' population, expenditure on sports etc. the data need for planning .

Weak monitoring of schools sports programme by the inspectorate division of the Ministry of Education and poor supervision of the programme by school heads also contribute to poor implementation of Sports policy as it affects schools.

Finally when an over-ambitious policy is written, the end of it is poor implementation. Writing of sport policy should not only be about finesse, ornamental write-ups or something written just to impress, it should also be about its workability. Every word used, every item written must be with sincerity of purpose and the ultimate aim of achieving it. Consideration must always be given to available human and material resources. Sport policy must not just be about ideal situations, its contents must be practicable. Some items of the 2009 Nigeria sports policy are ideal, but seem to be over-ambitious in Nigeria's current situation.

The Way Forward

1. There should be collaboration between the Ministry of Education and the Ministry of Sport

2. Ministry of sports should be made to provide sport equipment and facilities to schools and organize coaching clinics periodically for physical education teachers and sports officers

3. Federal, State and Local governments should live up to their responsibilities by providing sports facilities and equipment to schools.

4. Ministry of Education should make organization of annual Inter-House sport compulsory in all primary and secondary schools.

5. Qualified personnel should be employed to teach physical education and sports in all schools

6. Local government should be made to organize inter-schools sports competitions for schools in their domains, while should co-ordinate Inter- Local Government sports competitions among schools

7. Government should increase subventions to schools on sports

8. Schools heads must be made to spend money meant for sports on sports. Whether the money is contributed by parents for sports, generated from sponsorship or donations during inter-house sport or it was given by government
9. Heads of higher institutions should be made to use students' sports fees for its purpose.

10. All higher institutions must be made to comply with teaching of sports, and every student must offer a minimum of 4-credit unit in sports education as stipulated in the policy.

11. Teacher education curriculum should include physical education for all students in colleges of education and universities. This will prepare would-be teachers to teach physical education/sport in any school they find themselves.

Conclusion

Implementation of sports policy as it affects schools requires political will by government at all levels. Government has good intention towards schools sports but that intention should not only manifest on papers, it must be carried out with full determination to achieve its objectives. Sports facilities and equipment, qualified physical education and sports coaches must be made available in all schools for sports policy to be effectively implemented in school.

References

Adelakun, K. (2014). *Implementation of physical and health education programme of universal basic education in Imo State.* Unpublished Ph.D dissertation of the University of Port-Harcourt.

Brynad,P.A (2005). *Policy implementation: lesson for service delivery.* Retrieved on the 16th October, 2010 from http://www.unpan/un.org/intradoc/group/public/document.

Federal Republic of Nigeria (1989). *Sport development policy for Nigeria*, Lagos: The author.

Federal Republic of Nigeria (1989). *Guidelines for implementation of the sport development policy for Nigeria*, Lagos: The author.

Federal Republic of Nigeria (2009). *National sports policy of Nigeria*, Abuja: The author

Hardman, K. (2010). *Physical education: the future ain't what it used to be.* Retrieved on the 14th June, 2011 from http://wwww.restena.iu/apep/docs.

Hargrove, E.C. (1981). *The search for implementation theory.* Retrieved on the 16th October, 2010 from http:// www.eric.ed.gov/PDF/ED207158

Ikejiani, O. (1964). *Background to the problems of Nigerian education.* Ikeja: Longmans.

Jones, R. (1999). Sport and physical education in school and university. In J. Riordan & R. jones (Eds) *sport and physical education in China.* London: E&FN Spon.

Laker, A. (2000). *Beyond the boundaries of physical education: educating young people for citizenship and social responsibility*. London: Routledge Falmer

Okoh, J.D. (1993). Understanding the national policy on education: A challenge to the Nigerian teacher. In A.M. Wokocha (Ed) *Trends and Issues in the Nigerian primary school system.* Lagos: IVY press.

Webster Dictionary (2004). T*he new Webster's Dictionary of the English language.* New York: Lexicon publication

GENDER DISPARITY IN ANTHROPOMETRIC AND FITNESS CHARACTERISTICS OF UNIVERSITY STUDENTS

Moses, M. Omoniyi[1] and Osei, Francis[2]
Department of Sports and Exercise Science, Faculty of Allied Health Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
Email: [1] moniy152002@yahoo.com Tel: +233547336905
[2] Oseifranicis7@gmail.com

Abstract

Status of anthropometric and fitness characteristics are usually considered as vital tools for health assessment. Although studies have reported that university students exhibit different health-related lifestyles, gender comparative information on anthropometric and fitness characteristics in Ghana is scarce. The study examined gender disparity in anthropometric and fitness characteristics of apparently healthy university students. A cross-sectional descriptive design approach was utilized. 120 randomly recruited university students (mean age 22.01 ± 2.29years, male, 67 and female, 53) participated in the study. Body weight, height, body mass index, waist and hip circumferences, trunk flexibility and static body balance were measured in a laboratory setting. Results showed that male had higher age ($P < 0.05$), height ($P < 0.05$), waist circumference ($P < 0.05$), waist-hip ratio ($P < 0.05$) and static balance ($P < 0.05$) significantly. Weight ($P < 0.05$) and body mass index ($P < 0.05$) were significantly higher in female. The proportion of anthropometric and static balance characteristics of male university students was higher than female while trunk flexibility of male compared favourably with their female counterparts. To encourage healthy living of female in this study, flexibly modified and friendly physical activity programmes are recommended.

Key word: Gender, Body mass index, Waist-to-hip, Trunk flexibility, Static balance

.

Introduction

Gender refers to the array of socially constructed roles and relationships, personality traits, attitudes, behaviours, values, relative power and influence that society ascribes to the two sexes on a differential basis (Vlassoff, 2007). Vlassoff (2007) is of the opinion that gender characteristics do not exist in isolation but are defined in relation to one another and through the relationships between women and men, girls and boys. Gender connotes socially constructed roles, behaviours, expressions and identities of girls, women, boys and men as against sex - the biological characteristics such as anatomy and physiology that distinguish males and females (Health Canada, 2017) as applied in this study. Body size and shape related health problems are some of the concerns of the twenty first century. Also, lack of will-power to take healthy decision exposes most university students to health risk factors and inactivity. Adolescents' health is influenced by lifestyles, access to health care, schools and leisure opportunities, family background, communities and towns (Lazzeri et al, 2014). Being inactive has been adjudged to be one of the main factors declining life expectancy (Lee et al, 2012).

Physical inactivity is associated with becoming overweight or obese and therefore exposes one to the risk of high cholesterol, high blood pressure, bone and joint problems, diabetes, sleep apnea, low self-esteem and social stigmatization (Lieberman, Tybur & Latner, 2013; Pulgarón, 2013; Friedman, 2000; American Psychological Association, n.d.). Physical activity participation to improve range of motion, food consumption and growth prevalence is high in children irrespective of gender. Studies however revealed that participation of female in physical activities drop with aging without reduction in other components (Skelton & Beyer, 2003; Commodore, 1998). Aging has also been linked to more stability (balance) decline in female than male (Iosa, Fusco, Morone & Paolucci, 2014; Addo, 2011; Trudelle-Jackson, Jackson, & Morrow, 2006). These tend to increase susceptibility of female gender to illness or diseases. Gender differences are associated with how illness affects men and women, health-seeking

behaviours, availability of support networks, and the stigma associated with illness and disease (Baxter et al, 2016). Men and women respond differently when ill: time before acceptance of illness, recovery time, and treatment women and men receive from family members and society (Vlassoff, 2007).

The field of international health and nutrition has recognised gender discriminations and dynamics as major social determinants of health and nutrition outcomes (United Nations Children's Fund, 2011). Appearance of body sizes sometimes designate condition of health of an individual (American College of Sports Medicine - ACSM, 2014). Measurement of body size is mostly centered on circumference which provides general representation of body composition for both male and female (Tran & Weltman, 1989; 1988). Body composition has meaningful influence on possible range of motion at the anatomical joints when undertaken daily course. Sit and reach is commonly used to assess low back and hamstring flexibility (Jackson & Baker, 1986). The relative importance of hamstring flexibility to activities of daily living supports the inclusion of the sit and reach test for health-related fitness testing (ACSM, 2014).

Positive association between body size and physical activities contributes to improved range of motion, and center of gravity needed to maintain both static and dynamic balance. Literature recommends that strategic use of flexibility training be considered with caution for populations desiring maximum strength development (Stathokostas, Little, Vandervoort & Paterson, 2012; Kovacs, 2006).

Lifestyles of inactivity have been considered high among most university students and in particular female (Agopyan, 2015). These inactive habits expose university student to numerous health risk factors and diseases. Higher institutions of learning remain an experimental stage for youths to exhibit many lifestyles such as trying specific meal and drink without recall to side-effects. University life is connected to health risk drinking of male and female students. Fat accumulation due to poor eating habits is usually associated with the large body size or frame of female gender. Female are also labeled with low fitness center patronage

.

and physical activity participation thereby perform poorly in flexibility assessment.

Gender related articles on Ghanaians have been published (Addo, 2011; United Nations, 2014) but none of them considered body frame, trunk flexibility and static balance of university students. Although university students exhibit different lifestyles, anthropometric and fitness characteristics are vital tools for health assessment with many reported significant association of these health indices between male and female, comparative information on body mass index, waist-hip ratio, flexibility and balance body equilibrium in Ghana is scarce. The study examined gender disparity in anthropometric and fitness characteristics of apparently healthy university students.

Methodology

Participants

A cross – sectional descriptive design approach was utilized in this study. One hundred and twenty (120) randomly recruited students (aged between 17 and 32 years) of *Kwame Nkrumah University of Science and Technology, Kumasi* served as participants. The students were sampled from six colleges and consented to participate in the study after awareness discussion about the study objectives. The participants were year two, three or four students who had experience of university lifestyles more than one year. The participants' age were recorded in years. Measurements of body weight, height, waist and hip circumferences, trunk flexibility and static body equilibrium was carried out during the Trade and Technology (TRATECH, 2015) talents exhibition of the Department of Sports and Exercise Science in a laboratory setting using ACSM (2014) procedures.

Instrumentation

PRESTIGE stadiometer (Model HM0016D, India) with weighing scale was used to measure height in meters (m) and weight in kilograms (kg). Body mass index (BMI in kg/m^2) was calculated by dividing weight (kg) with the square of height (m) (Fryar, Gu & Ogden, 2012). Waist-to-hip girth ratio (WHR) was computed as

abdominal girth in centimeters (cm) divided by hip girth (cm); waist girth represents the narrowest girth around the natural waist and hip girth reflects the widest girth measured around the buttock (Katch, McArdle & Katch, 2011). Trunk flexibility was measured using the Canadian Trunk Forward Flexion test box. In the trunk flexibility test, the participants removed their shoes, sat and made soles of the feet flat against the sit and reach box at 26cm mark. Inner edges of the soles were placed within 2cm of the measuring scale. Slowly reached forward with both hands as far as possible, the position was held for approximately two seconds. Researchers ensured that the participants kept hands parallel, do not lead with one hand, fingertips overlapped and in contact with the measuring portion of the sit and reach box. The better of two trials of the most distant point in centimeters reached with the fingertips was recorded. Static balance of the participant was measured with standing stroke test that requires the participant to stand on one leg. Participants removed their shoes and placed both hands on the hips, positioned non-supporting foot against the inside knee of the supporting leg. After one minute practice, participant raised the heel to balance on the ball of the foot. The stopwatch was started as the heel is raised from the floor. The stopwatch was stopped if the hand(s) came off the hips, or the supporting foot swiveled or moved (hopped) in any direction, or the non-supporting foot lost contact with the knee, or the heel of the supporting foot touched the floor. The total time in seconds of three attempts, when any of the aforementioned occurred, were recorded.

Statistical Analysis

Data obtained were analyzed using SPSS Statistics 17.0 Data Editor for statistical analysis. Descriptive and independent T-Test analyses were reported in tables 1 to 3.

.

Results

Table 1: Descriptive Summary of Anthropometric, Flexibility and Balance Characteristics of Participants

N = 120		Age	Height	Weight	BMI	WC	HC	WHR	Flexibility	Balance
Mean		22.01	1.67	64.92	23.67	72.99	93.79	.77	10.56	80.67
Std. Er of M		.21	1.16	1.12	.58	.89	.92	.01	.74	6.76
Std. Dev.		2.29	1.27	12.26	6.40	9.78	10.06	.10	8.08	74.09
Skewness		1.83	-4.86	.67	6.26	-.47	-1.21	-2.39	-.80	4.19
Percentiles	25	20.66[a]	1.61[a]	56.17[a]	20.52[a]	67.00[a]	88.57[a]	.72[a]	6.14[a]	46.00[a]
	50	21.72	1.68	63.40	22.65	72.62	93.00	.76	11.91	61.00
	75	22.87	1.74	71.25	25.02	78.50	99.20	.81	15.75	87.00

a. Percentiles were calculated from grouped data.

BMI= Body mass index WC = Waist Circumference (cm) HC = Hip Circumference (cm) WHR = Waist-hip Ratio (cm)

Results in table 1 showed the participants' average age (22.01 ± 2.29years), height (1.67 ± 1.27 meters), weight (64.92 ± 12.26 kg), BMI (23.68 ± 6.40 kg/m^2), waist circumference (72.99 ± 9.78 cm), hip circumference (93.79 ± 10.06 cm), waist to hip ratio (0.77 ± 0.10), trunk flexibility (10.56 ± 8.08 cm) and balance (80.67 ± 74.09 seconds). All the variables assume positive kurtosis whereas only age, weight, BMI and balance were positively skewed. 75 percentile ranks of the participants have BMI of 25.02 kg/m^2

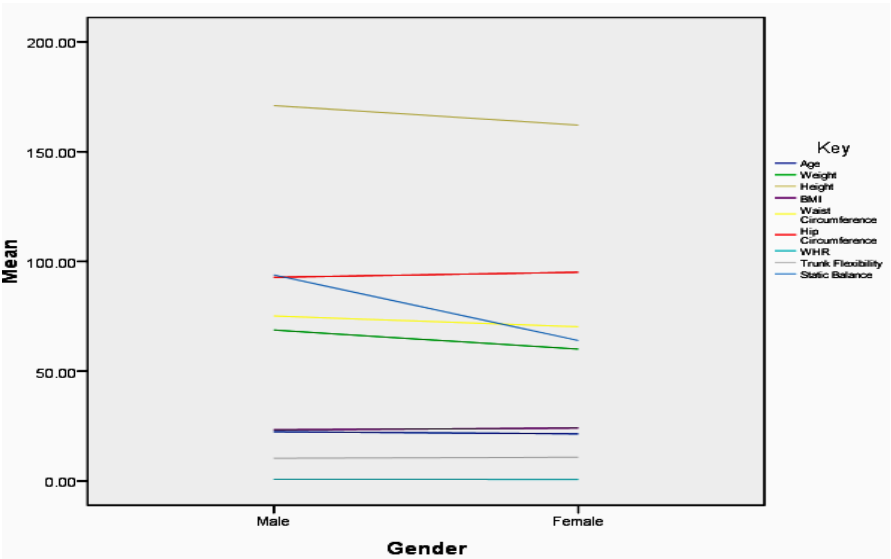

Fig. 1: Gender Anthropometric, Flexibility and Balance Characteristics Distribution

Figure 1 reveals the slope of line of mean of the various variables between male and female.

Table 2: Gender Comparison of Anthropometric, Flexibility and Balance Gender Comparison

Profiles	Gender	Mean	Std. Deviation	Std. Error Mean	Tvalue	Pvalue
Age (yr)	Male	22.42	2.35	.28	2.258	.026*
	Female	21.49	2.11	.28		
Weight(kg)	Male	60.74	10.49	1.28	4.095	.000*
	Female	68.07	12.69	1.74		
Height (m)	Male	1.70	1.53	1.87	4.059	.000*
	Female	1.62	4.93	.67		
BMI (kg/m^2)	Male	22.89	2.95	.36	-.664	.018*
	Female	25.94	9.06	1.24		
Waist Circumference (cm)	Male	75.15	10.08	1.23	2.800	.006*
	Female	70.25	8.73	1.20		
Hip Circumference (cm)	Male	92.78	10.79	1.31	-1.231	.221
	Female	95.06	8.99	1.23		
Waist-to-hip Ratio (cm)	Male	.80	.08	.01	4.807	.000*
	Female	.71	.11	.02		
Trunk flexibility (cm)	Male	10.33	9.06	1.11	-.332	.741

.

	Female	10.83	6.71	.92		
Static Balance (sec)	Male	93.86	83.32	10.17	2.231	.028*
	Female	63.98	56.93	7.82		

*Significant at $p<0.05$.

Table 2 shows that 67(55.8%) of the participants were males and 53 (44.2%) females. Females' BMI was more than the males ($25.94 \pm 9.06 > 22.89 \pm 2.95$ kg/m^2). Males have more static balance than females ($93.86 \pm 83.32 > 63.98 \pm 56.93$seconds). In WHR, males have higher value than females ($0.80 \pm 0.08 > 0.71 \pm$ 0.11cm). Significant difference exists in age, weight, height, BMI, waist circumference, waist to hip ratio and balance ($p<0.05$).

Discussion

The study compared anthropometric and fitness characteristics of apparently healthy male and female university students. Our findings showed that these university students generally have WHR and BMI value regarded as normal by ACSM (2014). Female students in this study were younger in age, shorter in height and had higher weight and BMI compared to their male counterparts. These findings corroborate the work of Agopyan (2015) who found that male students had higher means than females in all anthropometry parameters except percent body fat of students among school of Physical Education and Sports in Turkey with regard to gender and three different departments. Earlier studies also reported that females usually have higher BMI and overweight values compared to males (WHO, 2011; Huxley, Mendis & Zheleznyakov, 2010). The waist circumference of these university males was higher than that of the females as against higher hip circumference in female participants. A study on the abdominal obesity as indicators of waist circumference or waist-to-hip ratio in Malaysian adults' population showed that males had higher mean of WC and WHR compared to female in a study (Ahmad et al, 2016). This is in line with earlier submission that males have higher waist to hip ratio than female (Klein et al, 2007).

The sit and reach flexibility value of the females (non-athletes) in our study was not significantly different from that of males although studies have shown that female athletes have better range of motion than males (Mitani, 2017; Merino-Marban, Romano & Mayorga-Vega, 2014). Physical activities, exercises and athletic trainings are reported vital core indicators of differences in hamstring and low back range of motion between male and female (Egwu, Mbada & Olowosejeje, 2012).

Literature in support of favourable disposition of females to flexibility at the expense of males abounds (Egwu et al, 2012; Decker et al, 2003; Sullivan et al, 1994; Battié et al, 1987). This study however admits contrary view but rather concedes possible effects of physical activities as documented by ACSM (2014). ACSM, (2014) stressed that flexibility depends on distensibility of the joint capsule, adequate warm-up, muscle viscosity, compliance of ligaments and tendons. Physical activity participation of male could be possible reason for their better static balance performance.

Our study showed that university male students performed better in static balance than female. This connotes that males have higher and fixed base of support that allows easy movements around the center of gravity (Melo et al, 2017; Dorneles, Pranke & Mota, 2013). Study has documented a significance correlation between balance and sports skill performance (Sekulic et al, 2013). Study conducted by Iosa, Fusco, Morone & Paolucci (2014) documented that development of balance has sexual implications as permanent sexuality which replaced female estrus has effect on the phylogenetic development of upright gait. With respect to gender, Sekulic et al, (2013) showed that balance skills were significantly related to sports performance for men but not for women. Outcome of this study does not support the assertion of Mazzà et al, (2009) who reported that females have better control strategy to reach higher accelerations than males.

.

Conclusion

This study replicates previous findings of disparity in genders' anthropometric and static balance characteristics but admit no difference in trunk flexibility performance. The proportion of anthropometric and static balance characteristics was higher in male university students than female while trunk flexibility of male compared favourably with their female counterparts. Age differences may account for the observed disparities as male university students were averagely older than their female counterparts. Active physical activity participation, friendly physical activity programmes and specific stretching exercises wound play vital roles in bridging identified disparities and enhance healthy living.

References

Addo, B.D. (2011). Gender factor in motor skills performance of university practice primary school in Winneba, Central Region of Ghana. (Unpublished masters dissertation) University of Education, Winneba, Ghana.

Ademuyiwa, O.A. (2004). Health risk and gender issues. In V.C. Igbanugo, B.O. Ogundele, A.O.Abass and O.A. Adegbesan. (eds). *Multi-disciplinary Approaches to Human Kinetics and Health Education. Dept of Human Kinetics and Health Education*, University of Ibadan, Ibadan, Codat Publications; 203-209.

Agopyan, A. (2015). Comparison of body composition, cardiovascular fitness, eating and exercise habits among university student. Anthropologist, 19(1): 145-156

Ahmad, N., Adam, S. I. M., Nawi, A. M., Hassan, M. R., & Ghazi, H. F. (2016). Abdominal obesity indicators: waist circumference or waist-to-hip ratio in Malaysian adults population. International Journal of Preventive Medicine, 7, 82. http://doi.org/10.4103/2008-7802.183654

American College of Sports Medicine. (ACSM, 2014). ACSM'S Guidelines for Exercise Testing and Prescription. (9th Edition). Wolters Kluwer/ Lippincott Williams & Wilkins, pg 105-113

American Psychological Association: Adolescent girls and physical activity - Strengthening the body, mind and soul. Available @ http://www.apadivisions.org/division-35/news-events/news/physical-activity.aspx

Battié, M.C., Bigos, S.J., Sheehy, A, Wortley, M.D. 1987. Spinal flexibility and individual factors that influence it. *Physical Therapy.*, 67(5): 653-658

Baxter A., Salmon C., Dufresne K., Carasco-Lee A., Matheson F.I. (2016). Gender differences in felt stigma and barriers to help-seeking for problem gambling. *Addictive Behaviors Reports*, 3, 1-8.

Commodore, D.I. (1998). Falls in the elderly population: A look at incidence, risks, healthcare costs, and preventive strategies. *Rehabil Nurs.*, 20:84-89.

Decker, M. J., Torry, M. R., Wyland, D. J., Sterett, W. I., Steadman, J. R. 2003. Gender differences in lower extremity kinematics, kinetics and energy absorption during landing. *Clin. Biomech.*, 18(7): 662-669.

Dorneles, P. P., Pranke, G. I. & Mota, C. B. (2013). Comparison of postural balance between female and male adolescents. Fisioterapia e Pesquisa, 20(3), 210-214. https://dx.doi.org/10.1590/S1809-29502013000300003

Egwu, M.O., Mbada, C.E and Olowosejeje, D. (2012). Normative values of spinal flexibility for nigerians using the inclinometric technique. *Journal of Exercise Science and Physiotherapy*, 8 (2):93-104

Friedman, J. M. (2000). Obesity in the new millennium. *Nature*, 404(6778), 632-634.

Fryar, C.D., Gu, Q. and Ogden, C.L. (2012). Anthropometric reference data for children and adults: United States, 2007–2010. National Center for Health Statistics. Vital Health Stat 11(252).

Health Canada. (2017). Health portfolio sex and gender-based analysis policy. Available @ https://www.canada.ca/en/health-canada/corporate/transparency/corporate-management-

.

reporting/heath-portfolio-sex-gender-based-analysis-policy.html Retrieved 13/12/2017

Huxley R, Mendis S, Zheleznyakov E et al. (2010). Body mass index, waist circumference and waist: hip ratio as predictors of cardiovascular risk – a review of the literature. *European Journal of Clinical Nutrition*, 64(1):16 - 22

Iosa M, Fusco A, Morone G and Paolucci S (2014) Development and decline of upright gait stability. *Frontiers in Aging Neuroscience* 6:14. doi: 10.3389/fnagi.2014.00014

Katch,V.L., McArdle,W.D. and Katch, F.I. (2011). Essentials of exercise physiology. (4th ed.). Lippincott Williams & Wilkins, a Wolters Kluwer business

Klein, S., Heymsfield, S.B., Kelley, D.E., Leibel, R. L. Nonas, C. and Kahn, R. (2007). Special article ASN position statement waist circumference and cardiometabolic risk: a consensus statement from Shaping America's Health: Association for Weight Management and Obesity Prevention; NAASO, The Obesity Society; the American Society for Nutrition; and the American Diabetes Association. *Am J Clin Nutr*, 85:1197–1202. Printed in USA, NAASO and the American Diabetes Association. Available @ http://www.nutrition.org/media/news/latest-news/press-releases/waistcircumference.pdf

Kovacs, M. S. (2006). Applied physiology of tennis performance. *British Journal of Sports Medicine, 40*(5), 381–386. doi:10.1136/bjsm.2005.023309

Lazzeri, G., Azzolini, E., Pammolli, A., Simi, R., Meoni, V., & Giacchi, M. V. (2014). Factors associated with unhealthy behaviours and health outcomes: a cross-sectional study among tuscan adolescents (Italy). *International Journal for Equity in Health*, *13*, 83. doi:10.1186/s12939-014-0083-5

Lee, I., Shiroma, E.J., Lobelo, F., Puska, P., Blair, S.N., & Katzmarzyk, P.T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet, 380*, 219-229.

Leite, T., de Souza Teixeira, A, Saavedra, F., Leite, R. D, Rhea, M. R. and Sima˜ o, R. (2015). Influence of strength and flexibility training, combined or isolated, on strength and flexibility gains. *J Strength Cond Res* 29(4): 1083–1088

Lieberman, D. L., Tybur, J. M. and Latner, J. D. (2012), Disgust sensitivity, obesity stigma, and gender: Contamination psychology predicts weight bias for women, not men. Obesity, 20: 1803–1814. doi: 10.1038/oby.2011.247

Mazzà, C., Iosa, M., Picerno, P. and Cappozzo, A. (2009).Gender differences in the control of the upper body accelerations during level walking. *Gait Posture* 29, 300–303. doi:10.1016/j.gaitpost.2008.09.013

Melo, R. de S., Marinho, S. E. dos S., Freire, M. E. A., Souza, R. A., Damasceno, H. A. Melo, & Raposo, M. C. F. (2017). Static and dynamic balance of children and adolescents with sensorineural hearing loss. Einstein (São Paulo), 15(3), 262-268. https://dx.doi.org/10.1590/s1679-45082017ao3976

Merino-Marban, R. Romano, D. P., Mayorga-Vega, D. (2014). Influence of sex on the acute effect of stretching on V sit-and-reach scores in university students. Central European Journal of Sport Sciences and Medicine 6(2): 13–19

Mitani, Y. (2017). Gender-related differences in lower limb alignment, range of joint motion, and the incidence of sports injuries in Japanese university athletes. Journal of Physical Therapy Science, 29(1), 12–15. http://doi.org/10.1589/jpts.29.12

Pulgarón, E. R. (2013). Childhood Obesity: A review of increased risk for physical and psychological co-morbidities. *Clinical Therapeutics*,*35*(1),A18A32.doi:10.1016/j.clinthera.2012.12.014

Sekulic, D, Spasic, M, Mirkov, D, Cavar, M and Sattler, T. (2013). Gender-specific influences of balance, speed, and power on agility performance. *J Strength Cond Res*, 27(3): 802–811

Skelton, D.A. and Beyer, N. (2003). Exercise and injury prevention in older people. *Scand J Med Sci Sports*, 13:77-85.

.

Stathokostas, L., Little, R. M. D., Vandervoort, A. A. and Paterson, D. H. (2012). Flexibility training and functional ability in older adults: A systematic review. *Journal of Aging Research*, vol. 2012, Article ID 306818, 30 pages, 2012. doi:10.1155/2012/306818

Sullivan, M.S., Dickinson, C.E., Troup, J.D. 1994. The influence of age and gender on lumbar spine sagittal plane range of motion: a study of 1126 healthy subjects. *SpMine*, 19**:** 682–686.

Tran, Z.V. and Weltman, A. (1988). Predicting body composition of men from girth measurements. *Human Biology*, 60(1): 167-175

Tran, Z.V. and Weltman, A. (1989). Generalised equation for predicting body density of women from girth measurements. *Med. Sci. Sports Exerc.*, 21(1): 101-104

Trudelle-Jackson, E.J., Jackson, A.W., and Morrow, J.R.Jr. (2006). Muscle strength and postural stability in healthy, older women: Implications for fall prevention. *Journal of Physical Activity and Health*, 3, 292-303, Human Kinetics, Inc.http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/6012.pdf

United Nations (2014). Gender equality and sustainable development. World Survey on the Role of Women in Development2014.Available@http://www.unwomen.org/~/media/headquarters/attachments/sections/library/publications/2014/unwomen_surveyreport_advance_16oct.pdf

United Nations Children's Fund (UNICEF, December, 2011). Gender influences on child survival, health and nutrition: A narrative review. Available @ http://www.unicef.org/gender/files/Gender_Influences_on_Child_Survival_a_Narrative_review.pdf

Vlassoff, C. (2007). Gender differences in determinants and consequences of health and illness. *Journal of Health, Population, and Nutrition*, *25*(1), 47–61.

World Health Organization (2011). Waist circumference and waist–hip ratio**:** Report of a WHO expert consultation, Geneva, 8-11 December 2008**.** ISBN**:** 9789241501491

RECONCILING MENTOR AND RESIDENCE LECTURER'S SCORES IN GRADING STUDENTS ON TEACHING PRACTICE TO BE TRUE REFLECTION OF STUDENTS' PERFORMANCE

Charles Domfeh
Department of Health, Physical Education and Recreation
University of Cape Coast, Ghana
cdomfeh@ucc.edu.gh

Abstract

With the increasing number of students who qualify and enroll in universities the world over, and also in the various faculties and colleges of education studies, where students-teachers are trained for the teaching profession, it has become obvious that resident university teachers alone are unable to give ample supervision and monitoring to student-teacher trainees who go out of the campuses to experience real teaching practice. This is often referred to, as external or out of campus teaching practice. In trying to find solution to this vacuum created by insufficient lecturers, not being able to give enough supervisions and assessment scores to grade the practicing teachers, tutors or individuals in the various localities and/or institutions where the student-teachers do the external teaching practice are contracted by the universities as either mentors or internal supervisors to take oversight responsibilities of the student teachers formation, alongside the university lecturers, termed as external supervisors. This paper seek to find out how to reconcile the grading scores of the mentors or internal supervisors which at times, is often on the high side, as against the lecturers or external supervisors scores in order to reflect the true performance levels of the student teachers. This paper also lines up some suggested solutions to the dilemma in order to reflect the real students' performance scores.

Keywords: Teaching Practice, Student teachers, Supervision, Assessment Scores

.

Introduction

This paper intends to look at how to reconcile the dilemma of mentors' scores and university supervisors' scores for student-teachers, during teaching practice in order to get the true reflection of their performance, growth and development.

Concepts of Teaching Practice

Teaching practice requires a philosophy to give directions to values and actions. The philosophy is needed for the development of a reflective and reflexive learner who learns through situational analyzing, theorizing, hypothesis-testing, inquiring, experimenting, and justifying. Such development has to be built around the searching and identification of oneself as a teacher based on one's personal theory of teaching and learning. While supervisors can help by engaging in dialogues and interrogation with student teachers, they need also to carry out a personal reflection on their own self as a person of feelings, emotions, values and beliefs so as to embark on a transformation of their vision of what sort of teachers they would like to be.

Teaching practice programme in teacher education is implemented differently at different universities. Different models are applied depending on different national, regional and local contexts (Ure, 2009). Even if they overlap, different models can be identified. They emphasize different ideas, aspects and qualities. They have different historical roots and they represent different views on how professional practice knowledge is best nurtured. Different resources are allocated in terms of people, time, equipment and economy. Curricula differ and the procedures for assessing professional practice knowledge also differ. Sometimes the mentor or the university supervisor has a final say about student teachers who may pass or fail based on the final scores to use for grading. Often these decisions are taken by university based teacher educators. Teaching practice is generally part of a particular educational system and should be discussed in relation to that specific system.

Teaching practice in schools is considered to be a significant component of pre-service teachers' education programme (Wilson, 2006) and highly valued by student teachers (Beck &Kosnik, 2002). The practical teaching experiences help student teachers develop a contextualised understanding of the intricacies of teaching and provide an opportunity to develop competencies across a range of areas including classroom management skills, the fundamentals of lesson planning, awareness of personal teaching style, and the ability to interact with students. Furthermore, it helps in bridging the gabs between theories learnt in class and practical disposition of teaching profession which is the essential aspect of teacher preparation. Teaching practice experiences offer teacher students a place to observe and work with real students, teachers, and curriculum in natural settings.

However, the aim of teaching practice varies, depending on the view of teacher education which can be seen as cultural practices that serve local needs (Allen & Peach, 2007). The credits allocated for teaching practice varies from institution to institution with the minimum being six credits which least for a semester. This represents an integral part of teacher training to become a teacher. The single objective for teaching practice is to equip student to responsibly and competently pursue students' future role as the educator of the future leaders. The Triad

The main personnel involve in this programme are the student teacher, the mentor and university supervisor. Each of them has a key responsibility which when effectively discharged will contribute to programme success. The major responsibilities of the mentors and the university lecturers are to combine two roles: as assessors and as supervisors. As supervisors, they are expected to observe how student teachers prepare, deliver the lesson and conduct themselves as members of teaching profession and are expected to advise the students on how to improve their teaching skills. As assessors, they are expected to evaluate and assign scores to student teachers based on how they performs in respect to the goals and standards of the programme. Authentic

.

assessment evokes grounded theory which gives insights into teaching processes (Morse, 2003).

Every teacher preparation and development institution has a working handbook which clearly outlines the criteria for selecting a university supervisor and the mentor as well as the roles and responsibilities of the triad. The handbook further states clearly how to systematically supervise and assess students and the percentage of scores from the mentor and the university supervisor that contribute to the final grading of the student teachers. These roles and responsibilities are expected to be discharged diligently with unity and understanding for effective professional preparation and development of student teachers.

The Dilemma

Aside the clear definition of roles and responsibilities of triad outline in teaching practice supervision of student teachers, there are some criticisms about whether the mentors' scores or the university supervisors' scores should be used for final grading of student teacher for professional development (Smith, 2010; Haigh &Tuck, 2000). This is because there is widespread dissatisfaction with the discrepancies of mentor scores and university supervisors' scores usually presented for grading student teachers (Mattsson&Rorrison, 2011). Furthermore, Mattsson and Rorrison (2011) noted that many problems surrounding assessment practices arise. Out of an inability to reconcile these scores for sanity in grading student teachers as true reflection of their performance in order to achieve the goals of teaching practice programme.

How to Reconcile Dilemma of Mentor's and University Lecturer's Scores for true Reflection of Student teachers Performance

Adopting the Student Internship Programme

Having realized the above dilemma and its ardent effects on student teachers professional preparation and development some teacher training universities worldwide including University

of Education, Winneba (UEW) have rolled over the Student Internship Programme (SIP) which is also known as mentorship programme that clearly gave the highest power of scoring student teachers by mentors whose scores form about 70% of the final grading of students during internship for true reflection of student teachers professional growth and development. With these criteria, both mentors and university supervisors know their responsibilities and will plan how to supervise and assess student teachers in accordance with their stipulated roles and responsibilities. Anderson (2007) argued that pre-service teachers are influenced by mentors through evaluations, rewards, distribution of knowledge, vested authority and charisma. As a result of this coercive power through evaluation, some student teachers may change their behaviour to gain favourable scores from their mentors. In this case the single score of university supervisor will be used by the final grading body to authenticate or verify the scores from the mentors before using the best method to derive at the final grade for the student teacher.

Dual Function of University Supervisors

The challenge of conceptualizing the teaching practice goes hand in hand with the challenge of re-conceptualizing the supervision of student teachers. Ideally, the teaching practice should be an opportunity for teacher educators and experienced school teachers to partner with each other in supporting and supervising student teachers (Starkey & Rawlins, 2012). In reality, this is seldom the case and this results in inadequate supervision especially by the university supervisors and for that matter dilemma of whose scores to use for grading. Another issue is that some mentors who are not trained too do not have the needed experience to supervise and assess student teachers effectively as the true reflection of their performance.

Other activities also take the mentors away from being with the mentee. With all these issues, it is also noted that the supervision which did exist seldom involved supervisors helping students make connections between theory and practice. Similarly,

.

Anderson (1997) describes the situation as even worse in Malawi where supervision is "substandard, if indeed, it takes place at all"

To reconcile this dilemma, there is the need for empowering the mentor teacher with the responsibility for the training of the student teacher. The mentor teacher in turn would be supported by the university supervisor whose role would be focused on providing liaison teacher education between the teacher training institutions and the schools. This reconceptualization of supervision would ensure that supervision stand out separate from assessment which is another function of the supervisors (Smith, 2007). In that effect there will be mutual agreement as to which score to use in grading student teachers teaching for true reflection of their performance.

Method of Assessing Student Teachers Teaching

Arguably, the best form of assessment of student teacher's teaching for professional development is formative assessment. However, summative assessment also serves as a gate keeping function, which is suitable for selection of student teachers in order to protect the profession from incompetence (Smith, 2010). Smith (2006) has discussed the various roles of assessment in teacher education, and she claims that the two contradicting functions, the formative and the summative, the feed-forward and the judgmental role, increase in complexity when both functions of assessment are carried out by the same person. It can be stressful to have the role of supporter and judge at the same time, even though the final decision is placed with the university. Smith's (2006) argument point to the fact that assessment of teacher's teaching is a complex issue and the dilemma relating to the scores to be used for grading can be reconciled through the use of formative assessment technique. By so doing, the trend of scores about student teaches performance can predict the progress of score to use for the final grading of student teacher's teaching. With the data available, the stakeholders can verify the reliability of the grade to ascertain whether it's the through reflection of the student teacher's

performance during the course of professional growth and development.

Parallel Assessment of Student Teachers Teaching by Mentors and University Supervisors

Another way to reconcile this dilemma is encourage parallel assessment of student teachers' teaching by mentor and university supervisor. The two supervisors need to student teachers teaching at least two lessons after agreeing on what to look for during observation using the agreed observation instrument during the pre-observation conference. During the post- observation conference the mentor and university lecturer will compare their rating and make the necessary adjustment for accurate and reliable observation and feedback. This will bring about inter-rater reliability in scoring student teacher's teaching (Yarling& Wentz,1994). Further discussion of performance by the triad during the post-teaching conference will harmonize and increase objectivity of scoring the student teachers which makes team score during parallel teaching as a true reflection of student teachers performance for professional growth and development.

Use of Average Mean Score for Grading

Finding the average mean of scores from university lecturer and that of the mentor will reconcile the dilemma in grading student teachers during teaching practice for true reflection of student teachers performance for professional development. According to Kothari and Garg (2014, p. 129) mean is the most common measure of central tendency and useful for summarizing scores collected by different people or at different times.

Mentors and university supervisors should be encouraged to gather more scores about student teachers teaching. This will later show the trend of student teachers' performance in regards to professional growth and development. In that effect, when this data is submitted for final grading, the consistency in data from the mentor or the university supervisor will help come out with the

.

best modality to use in reconciling the dilemma of mentor's scores and university lecturers' score in grading of student teachers' on

teaching practice in order to bring about the true reflection of their performance for professional growth and development.

Use of Qualified Mentors and University Supervisors

Qualified and trained mentors and university supervisors who are specialist in the student teachers subject areas are better will be better supervisors and assessors if trained in addition. To be supervise and assessor of student teachers' teaching and give contextual and content-related feedback, there is the need for a mixture of subject content knowledge and pedagogical content knowledge and skill for effective scoring and feedback (Stark & Rawlins, 2011).

Mentors and university supervisors who are not in the area of student teacher's subject area of teaching may not be able to give accurate feedback on students teaching due lack of content and pedagogical knowledge. As a result, the scores from such assessors may not valid and reliable due lack of content and contextual congruence. In that case, the university supervisors' scores should be used for grading the student teachers' teaching as the true reflection of their performance for professional development.

Plan Supervision and Assessment of Student Teacher's Teaching

Planning is the most important key to success. Failing to plan is planning to fail. After the supervisor has gathered adequate information on teacher characteristics and instructional context, he or she then makes specific plans for the lesson observation. If teachers' developmental stages, characteristics, and instructional contexts can vary, so too should observational strategies. No single observation strategy can work well in every situation; thus, the supervisor must make important decisions to prepare for the observation.

The mentor or the university supervisors need to plan ahead of time and inform the student teacher especially about your intended

scheduled for supervision and assessment as well as achievement goals. This prior notice can prevent low performance of student teacher on the bases of inadequate preparation as well as the mentor or university supervisor from doing shallow supervision or assessment and scoring the student teacher's teaching for grading. With this approach, together with content-related feedback, we will reduce the dilemma of which scores to use for grading of student teachers' teaching practice due the planned and systematic nature of the process.

Congruence of Feedback with Assessment Scores

Feedback is another concept whose importance in the instructional encounter (Smith, 2010), the meeting point between learning, teaching and assessment, is becoming a major issue in research on assessment for student teachers' teaching (Smith, 2007). Feedback is currently seen as the heart of supervision and assessment for learning. Feedback is one of the most powerful influences on learning and achievement, but this impact can be either positive or negative (Hattie & Timperley, 2007). Quality of feedback is not just the structure of the feedback but also its accessibility to the learner, its catalytic and coaching value, and its ability to inspire confidence and hope (Sadler, 2009). Useful feedback which carries a positive impact on students' learning is not just a grade or a general statement to the learner, but as detailed meaningful information essential to the learner and the supervisor when planning future steps in the learning process.

According to Hattie and Timperley (2007) feedback serves multiple functions. First, it is a kind of careful description of the current status of learning based on performance. The student becomes aware of strengths and weaknesses by engaging in dialogue with the mentor or supervisor. Second, it reduces the discrepancy between current knowledge and the learning goal and improves teaching performance. There are two actors in this process, the supervisor and the student. The latter needs to be open to receive and accept feedback, and he/she needs to know how to apply it when planning and executing future performances.

.

In the light of this, the congruence of mentor feedback with the assessment scores or the university supervisors feedback with assessment scores of the student teachers' teaching demonstrate how valid and reliable the scores are for grading student teacher teaching as a true reflection of performance for professional development. On the face of this, the assessor whose feedback is most congruence with the scores should be used for grading student teachers' teaching.

Avoiding or Scaling down the Scores which are on the Extreme

Assessors whose scores for students are far lower or extremely high on the average from the rest of the supervisors, it is scaled down to reflect the average scores the other supervisors have awarded. In cases where the minimum supervision requirements would be met without the extreme scores, such scores are expunged in other to avoid influencing the true reflection of such teacher.

Conclusion

The success of teaching practice supervision rest in the hands of the stakeholders, who are to ensure that their roles and responsibilities are effectively discharged. The dilemma of scores from the mentors and university supervisors come as a result of negligence of duty, lack of qualified mentors and mentorship training as well as dual function of supervisors. When the dilemma concerning mentors and university supervisor's scores for grading student teachers 'teaching are not resolved then the preparation and development of student teachers is in total jeopardy. To avoid all these dilemma, the supervision handbook should spell out clearly who scores should be used for grading student teachers' teaching. This will provide everlasting solution to the dilemma of scores from the mentors and university supervisors in grading student teachers teaching for objectivity and as the true reflection of their performance for professional growth and development.

References

Anderson, D. (2007). The role of cooperating teachers' power in student teaching. *Education, 128,* 307-323.

Anderson, L.W. (1997). Teacher preparation for post-modern schools: The necessary integration of training and education. In W.K. Cummings & N. F. McGinn (Eds.). *International handbook of education and development: Preparing schools, students and nations for the 21st century*. Oxford: Pergamon.

Beck, C., & Kosnik, C. (2002). Components of a good practicum placement: Student teacher perceptions. *Teacher Education Quarterly, 29*(2), 81-98.

Hattie, J.,& Timperley, H. (2007). The power of feedback. Review of Educational *Research, 77*(1), 81-112.rH

Kothari, C. R., & Garg, G. (2014). *Research methodology: Methods and techniques* (3rd ed.). India: New Age International (p) Ltd.

Sadler, D. R. (2009). Indeterminacy in the use of preset criteria for assessment and grading in higher education. *Assessment and Evaluation in Higher Education, 34*, 159-179.

Smith, K. (2007). Empowering school and university-based teacher educators as assessors: School-university cooperation. *Educational Research and Evaluation, 73*(3), 279-293.

Smith, K. (2010). Assessing the practicum in teacher education: Do we want candidates and mentors to agree? *Studies in Educational Evaluation, 36,* 36-41.

Wilson, E. K. (2006). The impact of an alternative model of student teacher supervision: Views of the participants. *Teaching and Teacher Education, 22,* 22-31.

Yarling, J. R., & Wentz, P. J. (1994). *Student teaching case book for supervising teachers and teaching interns*. USA: Macmillan Publishing Company.