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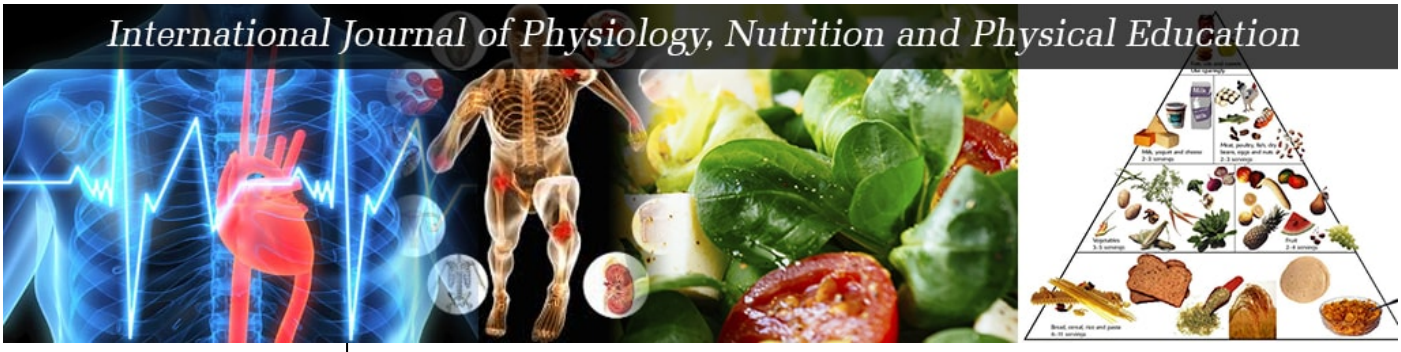

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Abstract
Pre-service teacher education programme should aim at adequate preparation of pre-service teachers to equip them with pedagogical and content knowledge relevant for full-time teaching career. However, a major obstacle to quality education is that several teachers are not well prepared to teach the school curriculum competently. Therefore, the study examined: 1) adequacy of pre-service teacher education for teaching the physical education (PE) programme, 2) relationship between adequacy of pre-service teacher education in PE and the frequency at which PE lessons were taught, and 3) relationship between adequacy of pre-service teacher education in PE and teacher-related barriers to teaching PE in public primary schools. The study design was cross-sectional survey. Multistage sampling technique yielded a sample of 172 subjects out of estimated population of 300. Validated and reliable self-structured questionnaire was used for data collection. Pre-data analyses were performed to clean data from errors. All data were analyzed using Statistical Package for Social Sciences (SPSS for Windows, Version 17). The study found that several teachers received inadequate knowledge in teaching physical education programme in public primary schools. From the study, positive correlation was found between pre-service teacher education in PE and the frequency at which PE lessons were taught. The study also revealed a negative correlation between quality of pre-service teacher education in PE and teacher-related barriers that hindered effective teaching of PE programme in public primary schools of the six selected circuits involved in the study.

Keywords: pre-service education, teacher-related barriers, public primary schools, PE programme

1. Introduction
Pre-service teacher education is an important component of professional preparation of prospective teachers to equip them with adequate and relevant knowledge, skills and attitudes to enable them function effectively in full-time teaching career. Studies suggest that teachers are important key to improving the quality of education (Badrunnesha & Kwauk, 2015) [3] and that the teacher should possess indispensable competencies like diligence, self-confidence and passion for teaching (Abas, 2016) [1]. In fact, the success of physical education (PE) implementation programme depends largely on the quality of pre-service education received by teachers who teach PE.

Pre-service teacher education programmes should aim at preparing quality pre-service teachers who are equipped with pedagogical knowledge that is able to meet the increasing demands associated with the instructional tasks of the teacher. However, a major impediment to improving quality of education is that several teachers are not well prepared to teach curriculum efficiently (Badrunnesha & Kwauk, 2015; Siedentop, 2004) [3, 20]. Researchers in the field of PE argue that professionals or individuals who seek to teach PE in schools and institutions should possess necessary training and qualifications needed to work in physical activity setting (Bucher & Krotee, 2002) [7]. It is also suggested that the quality of PE program in schools should emphasize health-related goals and lifetime activities that give students the skills they need to be active as children and as adults for both short-term and long-term health benefits (Garn, & Cothran, 2006; O'Reilly, Tompkins, & Gallant, 2001; Wallhead &

Buckworth, 2004) [10, 17, 24]. Consequently, it is important for teachers who teach PE to have qualities that include thorough knowledge of subject matter, ability to take personal interest in each learner, good communication skills and knowledge of clear boundaries between teacher and student.

Teachers of PE have a responsibility to inspire students to be lifelong participants in some form of physical activity (Lund & Kirk, 2019) [14] and also have "a firm belief in the value of physical activity and a desire to help extend the benefits of such an endeavor to others" (Bucher & Krotee, 2002, p.23) [7]. This makes it necessary for physical educators to possess an acceptable standard of motor ability and skill level and considerable knowledge of subject matter relating to various physical activities. Admittedly, PE is strenuous, therefore, demands that teachers of PE profession be in good physical and mental condition in order to carry out their duties efficiently and effectively. Classroom teachers can do a good job teaching but must have preparation to do so. However,

Most classroom teachers have had only one course in physical education methods as part of their teacher preparation. They are not well prepared to teach physical education. The demands as their curricular time increase year by year. They cannot possibly do all the things expected of them and physical education is too often the subject that gets left out (Siedentop, 2004, p.286) [20].

Interestingly, the teacher professional preparation programme is for students interested in pursuing a teaching career and includes basic skill courses, pedagogy courses, and various PE content courses such as physiology, biomechanics, history, philosophy, motor behaviour, organization and management, sport psychology, and sport sociology. The new teacher for PE programme needs considerable orientation and help in adjusting to a new classroom environment. Therefore, on recruiting a new teacher for PE, the school management should provide guidance and assistance concerning educational system and materials necessary to get settled into the school community. It is necessary for schools to provide pre-orientation that familiarizes the teacher with the teaching tasks in the first week of work in order to discuss, reinforce and clarify his or her duties and responsibilities regarding the PE programme.

Quality pre-service and orientation programme should result in happier and more productive members of the school community. It is also important to note that in-service training and staff development programmes are vital to building the instructional capacity of teachers. Because of the rapid changes happening within the teaching profession, teachers must attend regular in-service and staff development training programs (Bucher & Krotee, 2002) [7]. This is particularly important because new methods of teaching, programmes, assessment and evaluation have implications for all teachers. Based on several concerns about the quality of pre-service teacher education for teaching the PE programme, the study sought to investigate adequacy of pre-service teacher education for teaching the PE programme, the relationship between adequacy of pre-service teacher education in PE and the frequency at which PE lessons were taught, and the relationship between adequacy of pre-service teacher education in PE and teacher-related barriers to teaching PE in public primary schools.

2. Materials and Methods

2.1 Research Design

Cross-sectional survey was used for the study. The cross-sectional survey as a design was chosen because the study involved data gathering at a single point in time from a sample of pre-determined population. The data that were gathered possessed a description of the relative characteristics of the general population that was involved in the study. The use of cross-sectional enabled collection of valuable data within a short period of time among a population of teachers spread over a vase geographical area.

2.2 Population

The study targeted a population of 300 trained teachers (male=183, females=117) teaching in public primary schools of six selected circuits in the Volta Region of Ghana. The age distribution of study participants ranged from a minimum of 20 years to a maximum of 57 years. All subjects for the study were employees of Ghana Education Service (GES).

2.3 Sampling

Multistage sampling technique was used to gather a sample of 172 teachers (males= 97, females= 75) out of estimated population of 300 in the study area. In sampling, I constructed northern, central and southern strata based on geographical areas used for sports competitions. The northern stratum was composed of nine districts and one municipality from which one district (Kadjebi) was randomly selected. Within Kadjebi district were eight circuits from which two circuits were selected. Central stratum was composed of six districts and one municipality from which one district (Ho west) was randomly chosen. Ho west district had 13 circuits within which two circuits were randomly selected. The southern stratum involved six districts and one municipality from which one district (Akatsi north) was randomly selected. Within Akatsi north district were 6 circuits from which two circuits were randomly selected. The process of sampling in stages yielded a total of six circuits (two from each of the three strata) as data collection sites for the study. Total population sampling was used for collecting data from all public primary schools in the six randomly selected circuits. Total population sampling was employed because only six to 10 public primary schools were in the circuits that served as data collection sites. Similarly, only six classroom teachers were estimated to be in each public primary school even though schools that were clustered had more than six classroom teachers while few schools mostly in deprived areas had less than six classroom teachers. The use of multistage sampling ensured that study participants were objectively drawn from each of the three strata.

2.4 Instrumentation and Data Collection

Self-structured questionnaire was used to collect data from 172 respondents in six randomly selected circuits. Adequacy of pre-service teacher education in PE was assessed using a 6-point rating scale with the following descriptors: 1= "very poor", 2= "poor", 3= "fair", 4= "good", 5= "very good", and 6= "excellent". However, assessment of teacher-related barriers to effective teaching of PE was conducted on a 4-point Likert scale with the following descriptors: 1= strongly disagree, 2= disagree, 3=agree, and 4= strongly agree. The questionnaire was validated by three experienced researchers as a tool for collecting data for the study. The scale of items in all sections displayed a good internal consistency ($\alpha > 0.70$).

The purpose of data collection was explained to respondents prior to the distribution of questionnaire. Generally, week days (Monday to Friday) were used to distribute questionnaire to respondents. All respondents were allowed to complete the questionnaire at home or during first and second breaks to

avoid interference with instructional hours. Completed questionnaire were submitted to designated coordinators within one week of distribution. As part of the procedures for data collection, ethical clearance with ID number UCCIRB/CES/2016/14 was acquired from the Institutional Review Board (IRB), University of Cape Coast (UCC) in Ghana. Introduction letter was also acquired from the head of Health, Physical Education and Recreation (HPER) department of UCC. Four research assistants were given brief training on distribution of questionnaire and management of data.

All data were analyzed using Statistical Package for Social Science (SPSS for Windows, Version 21). There were pre-data analyses to clean data from errors that probably happened during data entering. Boxplots were generated to ensure absence of significant outliers for variables involving parametric analyses. Histograms were also generated for visual inspection and to ensure that variables were approximately normally distributed. Specifically, pie chart showing descriptive statistics (frequency and percentage) was used to present results of research question one while Spearman's rank order correlation (rho) was used to determine relationship between variables in research question two and three.

3. Results

3.1 Analyses of Demographic Characteristics of Subjects

Overall, 172 subjects participated in the study. Descriptive analysis of demographic data revealed that out of 172 respondents, male respondents were 97 (56%), while female respondents were 75 (44%). Analysis of gender distribution is presented in figure 1.

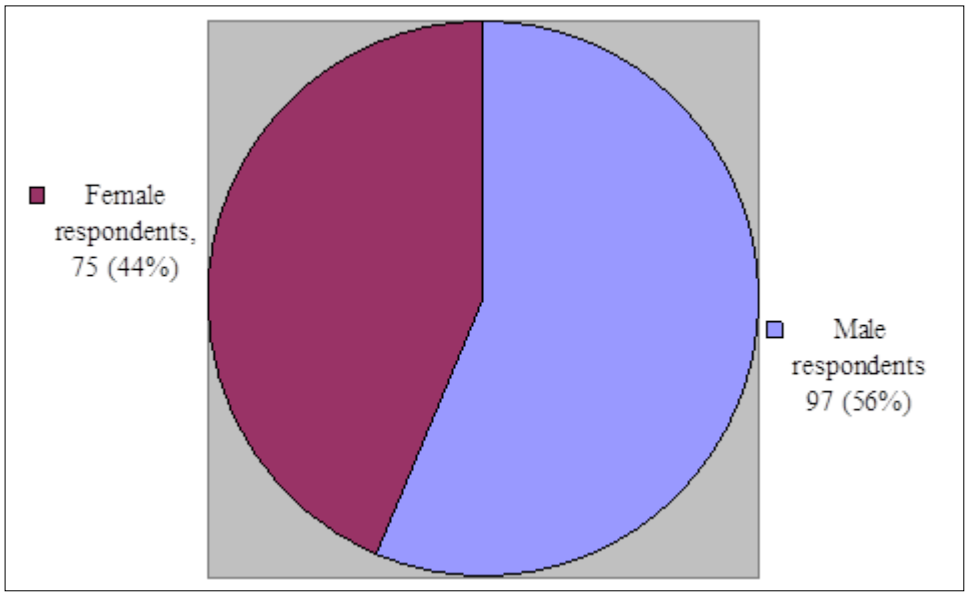

Fig 1: Gender distribution of subjects

In terms of class level analysis of demographic data, 95 respondents (55%) were drawn from upper primary while 78 respondents (45%) were drawn from lower primary. Analysis of class level distribution of respondents is presented in figure 2.

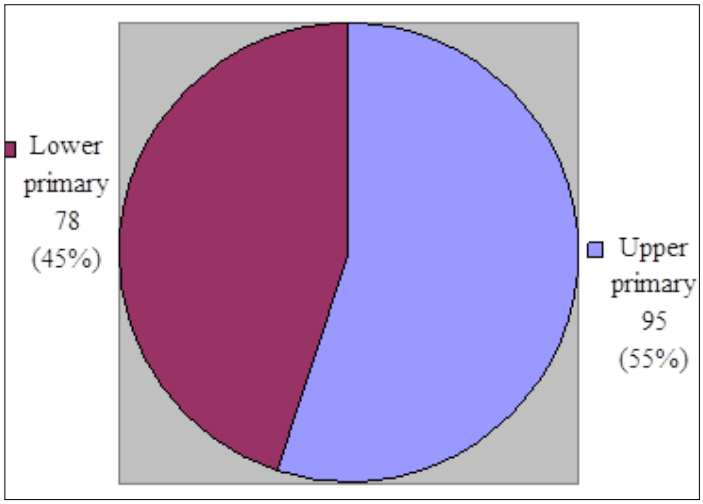

Fig 2: Class level distribution of respondents

Analysis of age distribution of respondents showed that 48 respondents (27.9%) were aged 28 years or less, 41 respondents (23.8%) were aged 29-30 years, 20 respondents (11.6%) were aged 31-33 years. Analysis also revealed that 29 respondents (16.9%) were aged 34-38 years, while 34 respondents (19.8%) were aged 39 years or more. Table 1 presents age analysis of respondents.

Table 1: Age analysis of respondents

Category	Frequency	Valid Percent	Cumulative Percent
≤ 28.00	48	27.9	27.9
29.00 - 30.00	41	23.8	51.7
31.00 - 33.00	20	11.6	63.4
34.00 - 38.00	29	16.9	80.2
≥ 39.00	34	19.8	100.0
Total	172	100.0	

3.2 Research Question One

How Adequate is Pre-Service Teacher Education for Teaching PE in the Public Primary Schools?

To determine whether teachers in public primary schools received adequate pre-service education in PE programme, subjects were asked to indicate their responses on a 6-point rating scale as: (1) very poor; (2) poor; (3) fair; (4) average; (5) good; or (6) excellent. Precisely, 25 teachers (15%), 33 teachers (19%) and 57 teachers (33%) rated the adequacy of PE programme that prepared them as teachers of PE in the public primary schools as very poor, poor and fair respectively. Additionally, the ratings for 26 teachers (15%) and three teachers (2%) were very good and excellent respectively. Figure 3 presents the results on the adequacy of pre-service teacher education for teaching PE in public primary schools.

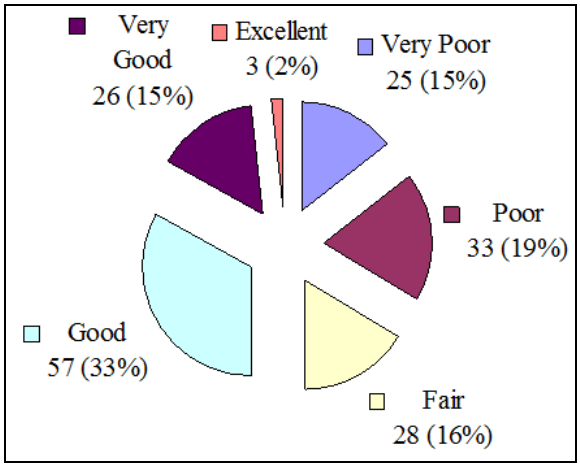

Fig 3: Adequacy of pre-service teacher education for teaching PE in the public primary schools

3.3 Research Question Two

Is there a Relationship between Pre-Service Education in PE and the Frequency at which PE Lessons are Taught in Public Primary Schools?

After pre-data analyses were conducted to clean data from errors, variables were screened, inspected and tested for parametric assumptions relating to Pearson product-moment correlation coefficients. Assumptions that were met included: approximately normally distributed variables, no significant outliers and measurement of variables on continuous scale. However, an inspection of the scatterplot suggested that there was no linear relationship between the two variables (pre-service education in PE and frequency of PE lessons). Since this situation violated the assumption of linearity between variables, Spearman's rank order correlation (rho) which is non-parametric counterpart of Pearson's product-moment correlation coefficient was used to determine the relationship between pre-service education in PE and the frequency at which PE lessons were taught in the public primary schools. The result suggested that there was a positive and statistically significant relationship between pre-service education and the frequency at which PE lessons were taught in public primary schools (r=.235, n=172, p=.002). Put differently, high level of pre-service education in PE was associated with high level of frequency at which PE lessons were taught in the schools. Table 2 presents the results of the relationship between pre-service education in PE and the frequency at which PE lessons were taught in the public primary schools.

Table 2: Relationship between pre-service education in PE and the frequency at which PE lessons were taught in the public primary schools

Variables		Pre-Service Education in PE
	Spearman's rank order correlation (rho)	.235
Frequency of PE Lessons		
	Sig. (2-tailed)	.002*
	N	172

* Significant at p<.05

3.4 Research Question Three

What is the Relationship between Pre-Service Education in PE and Teacher-Related Barriers to Teaching PE in Public Primary Schools?

Spearman's rank order correlation (rho) was used to assess the relationship between adequacy of pre-service education in PE and teacher-related barriers to effective teaching of PE in public primary schools. The results indicated that there was a negative correlation between pre-service education in PE and teacher-related barriers. However, the correlation did not reach statistical significance (r= -.087, n=172, P=.256). With this result, a decrease in the quality of pre-service education in PE is related to an increase in teacher-related barriers to effective teaching of PE in the public primary schools. Table 3 presents the results of the relationship between pre-service education in PE and teacher-related barriers to effective teaching of PE in the public primary schools.

Table 3: Relationship between pre-service education in PE and teacher-related barriers to effective teaching of PE in the public primary schools

Variables		Pre-service education in PE
	Spearman's rank order correlation (rho)	-.087
Teacher-related barriers		
	Sig. (2-tailed)	.256
	N	172

Significant at .05 level (2 tailed)

4. Discussion

Evidence from the current study revealed that several teachers received inadequate knowledge in PE before they began full-time professional carrier as teachers of PE in the public primary schools. The results suggested that most teachers experienced poor quality of PE programme during pre-service years in teacher training institutions. This inadequate pre-service exposure to PE is a potential cause of teachers' inability to deliver quality PE programme in public primary schools. Interestingly, previous research has revealed that minimal exposure to teaching experience and teacher-centered instruction have over the years dominated pre-service teacher education programmes (Hardman *et al.*, 2011) [11]. Teachers may hold a positive belief of the value of school PE

programme and advocate for adequate opportunities for children to participate in multiplicity of health enhancing physical activities. Unfortunately, a belief in the value of PE by teachers does not generate a quality programme nor does it ensure that learners would develop knowledge, skills and be physically educated (DeCorby *et al*., 2005) [8]. Admittedly, teacher professional preparation programme is for persons interested in pursuing a teaching career and includes basic skill courses, physical activity and pedagogy courses, and various physical education content courses such as physiology, biomechanics, history, philosophy, psychology and sociology.

In the current study, adequacy of pre-service teacher education was positively related to the frequency at which PE lessons were taught in the public primary schools. This means that an increase in the level of pre-service teacher education in PE can potentially increase the frequency at which PE lessons are taught in schools. The more pre-service teachers are adequately prepared for teaching PE, the more frequently they will be able to teach the PE programme in schools. Earlier studies have investigated teachers' knowledge of content and pedagogy (Moats & Foorman, 2003; Piasta *et al*., 2009) [16, 18]. In a study of relationships, Raban (2002) [19] found that teachers' expectations of student performance are directly associated with student achievements. It is important for teachers who teach PE to have qualities that include thorough knowledge of subject matter, ability to take personal interest in each learner, good communication skills and knowledge of clear boundaries between teacher and student. Bucher and Krotee (2002) [7] argue that professionals or individuals who seek to teach physical education in schools and institutions need to "possess those qualifications listed for physical educators and coaches and, in addition, the special training and qualifications needed to work in the activity …" (p.234).

Undoubtedly, adequacy of pre-service education in PE was negatively associated with teacher-related barriers that served as impediment to teaching PE in public primary schools. In this observed situation, inadequate preparation of teachers for teaching PE resulted in increased teacher-related barriers confronted by public primary school teachers during teaching. Researchers have reported that teachers lack basic necessities including classrooms and technological resources that are relevant for professional development and instruction. This situation has caused teacher educators to train pre-service teachers using unsuitable methods including teacher-centered and non-participatory approach (Frost & Little, 2014; Teshome, 2012) [9, 22]. Literature has also reported worrying situations where teacher-educators were unable to impart foundational literacy skills and literacy education to student teachers because they themselves received inadequate training on concepts they taught (Joshi *et al*., 2009) [13]. To minimize such teacher-related barriers, it is important to use in-service training and staff development programmes as vital measures to building the instructional capacity of teachers in situations where teachers demonstrate inadequate PE knowledge. In support of this assertion, Bucher & Krotee advocate that "Because of the rapid changes occurring within the profession, staff members should attend regular in-service and staff development training programs" (p.237). Several suggestions have also been made to lessen the barriers confronting quality teaching and learning of PE. These suggestions include moving from goals to competencies at school subject level and reorganization of content areas to enhance experiential learning education for sustainable development with focus on improving learners' knowledge of sustainability in an effort to transform attitudes and behaviours (Azeiteiro *et al*., 2015; Biasutti & Frate, 2017; Jorge *et al*., 2015; Michalos et. al, 2015; Sipos *et al*., 2008; Thoma & Day, 2014) [2, 5, 12, 21, 23]. It is also well established that teachers' knowledge of content, pedagogy and quality of teacher training programme impact achievement of students (Ball *et al*., 2008; Binks-Cantrell *et al*., 2012) [4, 6]. Therefore, it is important for PE teachers to deliver comprehensive PE instruction by teaching fundamental motor skills to help children participate actively in a wide-range of movement activities that can be carried from childhood to adulthood for health benefits.

5. Conclusions

It is observed from the findings that many teachers receive inadequate knowledge in PE before starting professional carrier as teachers of PE in the public primary schools. In the current study, an increase in the quality of pre-service teacher education in PE is capable of increasing the frequency at which PE lessons are taught in schools. Consequently, a decrease in the quality of pre-service teacher education in PE is capable of causing an increase in teacher-related barriers. This situation hinders effective implementation of academic programme in our schools.

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