

Implication of Outdoor Environment on Children's Physical Activity Performance Levels in Public Preschools in Borabu Sub-County, Kenya

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Abstract: Children's physical activity performance levels vary by provisions and quality of outdoor areas despite this; many pre-schools do little to create the kind of outdoor environment and experiences that are important for young children. The study therefore aimed to finding out the implication of outdoor environment on children's physical activity level. The study was based on Descriptive survey design. It involved; 44 primary school head teachers, 44 pre-school lead teachers and 309 final pre-school class pupils (88% 88% and 19% of the study population respectively), selected using cluster, purposive and simple random sampling design respectively. Data was collected using questionnaires, interview schedule and Observation checklist. The major findings included that there was a relatively weak relationship between the availability, adequacy, effectiveness and site of various components of outdoor environment in ECDE centres and the ability of preschool children's ability to Performing various loco-motor activities and Rhythmic Movement Activities. The results from observation and interview schedules indicated that a rich outdoor environment had a positive influence on preschool children's development of various skills. The study recommends that the government and other stakeholders need to invest in the provision of outdoors so as to enhance children's physical activity levels.

Keywords: State, Outdoor Environment, Preschools. Physical Activity Levels.

1. INTRODUCTION

Background to the study:

The quality of the school playground, as well as decisions related to frequent activities has an effect on children's physical activity levels (Davison & Lawson 2006). A study conducted in the United States of America by Sallis, et al. (2001) to assess the influence of school environmental features on pupil's physical activity level. The study comprised of 137 pupils at 24 public middle schools to assess type of area, amount of size and improvement. Learner physical activity and the existence of outdoor equipment and supervision were directly observed before school, during lunch break, and after school. The major findings indicated that environmental qualities explained 59% of the variance in the proportion of boys who were physically active and 42% of the variance for girls. The study concluded that school environments with high levels of supervision and improvements stimulated girls and boys to be more physically active. Although the study

sought to find the influence of school environmental characteristics on pupil's physical activity level, the study did not establish a joint effect of school environmental components on both boys' and girls' physical activity performance levels which will be addressed by the current study. Also the study was conducted among the middle schools children in USA while the current study was carried among preschool going children in Borabu Sub-county, Kenya.

In the City of Liverpool UK A cross-sectional study was done by Ridgers, Fairclough, & Stratton (2010) investigated the relationship between a series of recess variables and pupils' physical activity levels. The study sampled 128 children boys aged 9 to 10 years old from eight schools. The physical activity performance levels of the learners were observed during Play using SOCARP (System for Observing Children's Activity and Relationships). Analysis of multilevel prediction models revealed that children without outdoor provisions during school breaks engaged in sedentary activities and less moderate physical activity performance levels than children provided with outdoor equipment. In addition, as outdoor space per child improved, sedentary activity reduced and vigorous activity became much better. There are differences that exist between this study and current study. The study was a cross-sectional research design which is an observational study that record information about their subjects without manipulating the study environment but compare two or more different subjects against a specific trait. Ridgers et al also sampled primary school children aged 9 to 10 years. This study on the other hand was based on descriptive research design which involves observing a phenomenon without influencing it and sampled pre-school children age 3 to 5 years.

Baquet, et al. (2012) assessed children's physical activity performance levels during school recess from low and high socio-economic environment in 4 elementary schools located in north of France. Four hundred and seven children aged between 6 to 11 years from the four primary schools participated in the study. The sampled schools had similar and related outdoor space. Two schools were situated in high socioeconomic region and the others in a low socioeconomic area. Children's physical activity performance levels were calculated by utilization of accelerometry during school break in the morning and afternoon throughout the four day of the school week. Baquet et al established that boys were considerably more engaged than girls but there were no disparities in sedentary occasion between high and low socioeconomic conditions. Additionally, the finding showed that children from low socioeconomic settings spend much time in light and very high intense physical activities compared with those from high socioeconomic backgrounds. Children from high socioeconomic group spent considerably much time in moderate and vigorous physical activity than those from low socioeconomic backgrounds. Baquet et al sampled children aged 6 to 11 years from primary schools from France. The assessments of children's physical activity performance levels were computed during recess using accelerometry. The current study on the other hand sampled 3 to 5 year olds from ECDE centres in Borabu Sub-county, Kenya and data collection tools consisted of teachers' questionnaires, Teachers interview schedule, and pupils observation checklist.

In Flanders, Belgium Cardon, Labarque, Smits & De (2009) investigated the influence of outdoor equipment and markings on physical activity performance levels using a sample comprising of forty the state preschools. The schools were randomly assigned to certain conditions first, in ten pre-schools outdoor equipment were provided, secondly, in ten pre-schools playground markings were made using different painted, thirdly, in ten schools outdoor equipment were made available and markings were dyed, fourthly ten other schools were used as a control group. Cardon et al used accelerometer to collect data on physical activity performance levels during the children's break time. The study found that provisions of outdoor markings and equipment is not sufficient to increase physical activity performance levels and decrease levels of sedentary activity during school recess because of this Cardon et al suggested that teachers should have more activating supervision and have many structured physical activities for children throughout recess period. Although Cardon et al investigated the influence of providing outdoor apparatus and playground markings at the public preschools the study was carried out in Flanders, Belgium. The current study on the other hand was carried out in Borabu Sub-county Kenya which is two different geographical areas

In Melbourne, Australia Salmon (2010) studied factors that influence young peoples' involvement in physical activity in two cohorts across socioeconomic settings, from the year 2001 and 2008. The study sampled about two thousand seven hundred children aged five to six years and ten to twelve years baseline. Data was gathered by means of surveys, and use of Actigraph accelerometer worn for eight days. Salmon (2010) major finding was that physical environmental characteristics were notably linked with increase in pupil's physical activity behaviour. This was a longitudinal study

which researchers conduct several observations of the same subjects over a period of time. The study was also based on children's physical activity behaviour. It used a very large sample of 2,700 children from primary schools and the study was also conducted in Melbourne, Australia. The current study was based on descriptive survey design and comprised of a small sample of 309 pupils from ECDE centres in Borabu Sub-county, Kenya.

A study on provisions of the early child care centre by Bower, Hales, Tate, Rubin, Benjamin, & Ward (2008) found that moveable equipment and loose materials and fixed equipment were linked with enhanced physical activity behaviour of children. This research indicated that provision outdoor environment is important in enhancing performance in physical activity. The study by bower et al (2008) only puts focus on moveable and fixed equipments. The current study on the other hand sought to find the implication of all environmental components on physical activity level in public pre-school settings. In fact outdoor environments should mostly comprise of natural and loose materials.

In the province of Pistoia Italy Tognarelli, et al. (2004) did a study on children nutrition of eight year old children. The study randomly selected from 50 percent of the children in the 3rd grade elementary class during the year 2002. The goal of the study was to establish whether eight year olds living in urban differed from their rural peers in physical activity. Tognarelli et al., found that time spent outdoors considerably predicted children's physical activity behaviour. Tognarelli et al., study was based on investigation on nutritional status of eight year old urban and rural children in primary schools in Italy while the current study was based implication of outdoor environment on physical activity level and learning. The current study will also be carried out in ECDE centres of Borabu Sub-County, Kenya which are two different study areas.

In Africa, according to African Network for the Prevention and Protection Against Child Abuse and Neglect (ANPPCAN) (2005) many young children learn in schools which are ill equipped, dilapidated, and disparities exist in terms of standards and facilities available to children which in turn affect pupil's learning. It's therefore, unfortunate that many children do not afford the opportunities attend good quality preschool. Kiruki, (2007) further, reports that the work load in preschools in most African countries is too much since the syllabus is wide hence children have no enough time to play outdoors. This situation leaves many children without proper alternatives for learning and performing various skills for holistic development.

In Kenya Wachira, Muthuri, Tremblay & Onywera (2014) reporting on the physical activity status of Kenyan child indicates that children aged five to seventeen years aren't performing well in accomplishing the required Physical Activity levels. Concerning physical activity Wachira et al highlights that many children in rural and urban including those in Borabu Sub-County have low levels of physical activity. Although this is the case the report does not give how the status of outdoor environment (availability; adequacy, effectiveness, use of facilities) promotes Physical Activity at school level. The current study sought to fill this gap by examining the implication of outdoor environment on children's physical activity performance levels in public preschools in Borabu Sub-County, Kenya

Statement of the problem:

Early Childhood Education objectives in Kenya aim at allowing the learner to enjoy living, learning through play, and develop physical and mental capabilities mainly through the outdoors. In spite many research showing positive correlation between outdoor play and children's physical activity and learning, recent trends indicate that children no longer engage in outdoor and that major elements of the outdoor environment are missing. The 2006 Service Standard Guidelines in Kenya stress that because of importance of early childhood stages outdoor environment should be an integral part to be implemented in pre-schools. Although, the poor trends in provision of outdoor environment have been identified there is dearth research finding on the implication of the status of outdoors on the children's physical activity therefore the current study investigated the implication of the status outdoor environments on the children physical activity level in Borabu Sub-County, Kenya. The foremost concern of the study was to establish whether the outdoor environments components were sufficient, effective and of different multiplicity to improve children's physical activity level.

The Purpose of the study:

The purpose of this study was to investigate the implication of outdoor environment on children's Physical activity level in public pre-schools in Borabu Sub-County.

Significance of the Study:

The study has a potential contribution to the existing body of knowledge. The findings of this study may be important to the teachers of early childhood education in identifying the impact outdoor environment and play. The parents may help teachers to provide a quality outdoor environment in order to enhance children's physical activity and learning. Additionally, the findings may be important to the school administration in providing adequate outdoor environment and play activities. Further, the findings may necessitate the Ministry of Education to provide and co-ordinate policy guidelines, develop curriculum, supervise ECDE programmes, register ECDE centres, providing skills and infrastructure for development. Finally, the study findings possibly may assist the County Education Boards to put more effort in providing an enabling environment for ECDE children.

Conceptual framework:

Conceptual framework is schematic figure which displays the variables included in a study (Oso & Onen 2009). The arrows and lines in the conceptual framework show relationship between the independent (state of outdoor environment) and dependent (physical activity performance levels and learning experiences) variables. The relationships between variables are explained and discussed in figure 1.1 below:

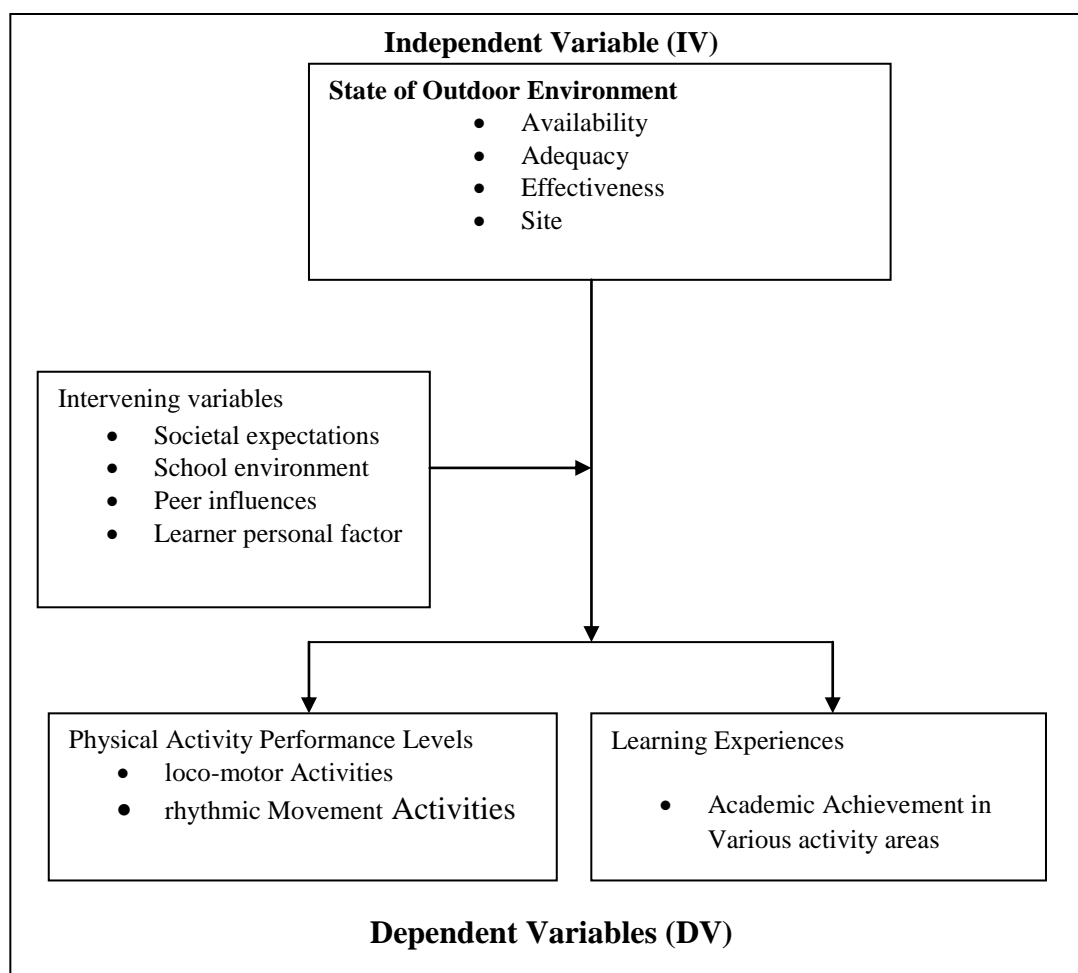


Figure 1: Conceptual framework showing the implication of outdoor environment children's Physical activity level.

Source: The Researcher (2015)

The independent variable in figure 1 above is the preschools' outdoor environmental qualities which encompass the availability, adequacy, effectiveness and site of rich outdoor environmental components in various preschool centres. The Dependent variable is the preschools' physical activity levels and learning experiences. An efficient outdoor environment

should to provide good sense of balance in the learner's achievement in physical and learning activities. Extraneous variables are identified as societal expectations, School environment, Peer influences and Learner personal factor. This means that the independent variables have direct effect on the dependent variable. However, the relationship may be affected by these intervening variables although they were not included in the study.

2. RESEARCH METHODOLOGY

Research design:

The current study adopted a descriptive survey design which according to Orodho (2005) is used for preliminary and exploratory studies to permit the researchers to collect, summarize, present and interpret data for the purpose of clarification. The research design was therefore used by the researcher in gathering information, summarizing, presenting and interpreting information to establish the influence of outdoor environment on children's physical activity performance levels and learning in public pre-schools. Descriptive survey was also relevant for the study because the researcher was able to collect both quantitative and qualitative data.

Study area:

The study was carried out in Borabu Sub-County of Nyamira County, Kenya. Borabu Sub-County is the largest Sub-County in Nyamira with an area of 248.3 kilometres square. The Population Density of Borabu Sub-County is 296 people per square kilometre. According to the Commission on Revenue Allocation (CRA), (2009) Statistics indicates that Borabu Sub-County has a poverty index of 48.6. This is an indication that many people are poor. Studies also indicate that dropout and repetition rates especially in lower primary are high in Nyamira County which influenced the selection of the location. Since the majority of young children spend significant part of their day at early childhood development and education centres, it is therefore imperative to find out whether outdoor experiences provided are positive and supportive enough to enhance physical activity and learning, hence the study was carried out in 50 public pre-schools in the sub-county. Although there are several factors that influence physical activity level and learning, this study focused on outdoor environment of children in the ECDE programmes and not other aspects. The divisions were easily accessible because of the good road network which cuts across the divisions and given that no similar study has been conducted in the sub-county, the study location becomes more suitable.

Target population:

The study targeted the 50 primary head teachers, 50 preschool lead teachers and 1603 final pre-school class pupils Borabu Sub-County had 50 public preschools, three divisions namely Esise, Nyansiongo and Mekenene.

Sample and sampling procedures:

The current study employed cluster, purposive and simple random sampling design. The schools were selected using cluster sampling design. All the ECDE centres in the Borabu Sub County were divided into three clusters and then random sampling procedure was done in every division. Purposive sampling technique was also used to select 44 Head teachers and 44 ECDE lead teachers. On the other hand simple random sampling procedure was used to select a sample of 309 pre-unit children from sampled schools.

Data collection instruments:

The research instruments consisted of questionnaire, interview schedules and Observation Checklist.

Questionnaire:

The questionnaires were utilized to gather information from school head teachers and pre-school lead teachers

Head Teachers Questionnaires and pre-school lead teachers

The questionnaires were constructed based on the study objective. The questionnaire consisted of four sections. Section A gathered data on Demographic information, section B consisted of collection of data on the state of outdoor environment, Section C: was on the ECDE Children's learning experiences and section D collected data on the strategies ECDE teachers are using in providing outdoor play activities within outdoor environment. Teachers Questionnaires is attached as Appendix II.

Teachers Interviews:

Few guiding questions were prepared focusing on the outdoor environmental components of ECDE centres; availability of rich outdoor environment, adequacy of rich outdoor environment, quality of outdoor environment, utilization of outdoor environment, state of outdoor environment, the site of the outdoor environmental; the role of outdoor environment on children's physical activity levels. Interview Schedule was used to verify the data collected by questionnaires. Teachers' Interview Schedule was attached as Appendix IV.

Observation checklist:

Observation checklist was used for direct observation of the outdoor environment variables, children's involvement in play activities and to check whether conditions in preschool outdoor environment encouraged productive engagement or not. Kombo & Tromp (2006) argues that direct observation presents data in its natural form, makes the observer an active participant in the study and permits time to think about what is occurring rather than on how to record it.

Validity of Instruments:

Validity is the degree to which the instrument measures what it is designed to measure (Mugenda & Mugenda, 2005) The instruments, immediately after being designed, they were presented to respondents to determine whether the questions were clear, comprehensible, and in sound order (face validity). Oswald & Price (2006) defines face validity as the degree to which an instrument appears to measure what it claims. The face validity was achieved by asking respondents to rate the validity of tools as it appears to them. Expert judgment by lecturers was also be used to ensure validity.

Reliability of Instruments:

Reliability is the degree to which the result is consistent and accurate over time and represent of the target population and checks whether the results can be replicated under a similar methodology (Joppe, 2000). Before the actual study, a pilot study was conducted in two pre-primary schools. These schools were not included in the actual study. Through piloting, item deficiency and ambiguity are uncovered (Faranenkel & Wallen 2009).

The study employed the split-half method to find out the reliability of the Questionnaire. The developed questionnaires were administered once and the scores of each half were recorded separately. Pearson's product moment formula was used to calculate the correlation coefficient between the two halves. The study also used Spearman-Brown correction formulae so as to improve reliability of split half. The calculation from Spearman-Brown correction formulae indicated a correlation coefficient ($r=0.848$) greater than 0.6 and according to George & Mallery (2003), it was therefore considered appropriate. Hence the measure had very high reliability indicating very high consistence in measuring instruments used.

For qualitative data the pilot study adapted triangulation as a method of ensuring authentication of interview schedule, and observation checklist. Triangulation in research involves looking at something from several angles rather than looking at it in merely one way (Neuman, 2000). Cohen, Manion & Morrison (2011) argues that triangulation occurs when two or more approaches of data gathering or sources of data are used to exemplify authentic picture of a phenomenon under the study then validating the congruence among them.

Data collection procedure:

The researcher obtained permit from the National Commission of Science, Technology and Innovation (Appendix II) through the Post Graduate Studies of Jaramogi Oginga Odinga University of Science and Technology (Appendix III). The researcher sent introductory letters to all Respondents (Appendix IV). The first visitation was made to the Preschools concerned and the researcher met the heads of institutions and briefed them about the study and date for data collection was agreed upon. The second visitation was made prior to data collection and the respondents were met briefly about the study and thereafter data was collected. Quantitative data was collected in one month. Each interview schedule lasted for approximately thirty minutes. Qualitative data from interviews was recorded with permission from the participants.

Methods of data analysis and presentation:

Data from questionnaires and observation checklist was analyzed using descriptive statistics by the help of SPSS version 22. Wolveto (2009) describes descriptive statistics as one that involves the process of computing a mass of raw data into tables, charts, with frequency distribution, percentages, variance, standard deviation and associations. The study also adapted thematic analysis for qualitative data to obtain a general sense of the information.

3. RESULTS AND DISCUSSIONS

Outdoor Environment and Children's Physical Activity Performance Levels:

The first task of the study was to examine the implication of outdoor environment on children's physical activity performance levels. This was done by establishing the relationship between availability of various components of outdoor environment, adequacy of rich outdoor environment in various learning centres and effectiveness of outdoor environment and preschoolers' abilities to perform various physical activities which included loco-motor and rhythmic movement activities. The summary of the findings are presented under the following sub-headings.

Performing Loco-Motor Activities:

THE KEY

L1---Level 1: sedentary

L2- Level 2: light- make slow body movement of limbs and trunk

L3-Level 3: moderate in body movement of limbs and trunk

L4-Level 4: Vigorous intensity

L5 --Level 5: very fast vigorous in using body parts

An observation checklist was used by the researcher to assess the performance of preschool children in various loco-motor. The research himself went to 42 ECDE centres to observations the children as they performed the nine loco-motor activities that were of interest to the study. The obtained results are summarized in table 1.

Table 1: Performance of learners in lo-motor Activities

Children's Physical activity performance levels assessment	Percentage of Pre-School Pupils In Various Levels								
	Stepping	Walking	Running	Jumping	Leaping	Skipping	Sliding	Climbing	Riding
L1	7.4	6.7	5.1	6.7	9.1	7.4	9.1	10.4	6.7
L2	30.0	21.5	19.5	16.2	29.3	20.5	27.6	26.6	26.3
L3	23.2	32.7	26.9	31.0	24.6	26.9	24.2	24.6	24.9
L4	27.9	24.9	29.0	24.6	21.9	28.3	22.2	21.2	20.5
L5	11.4	14.1	19.5	21.5	15.2	16.8	16.8	17.2	21.5

As reflected in table 1, the researcher observed 297 preschool learners in nine loco-motor activities (stepping, walking, jumping, leaping, skipping, sliding, climbing, running and riding). Among the nine assessed loco-motor activities, the ability of learners to climb the outdoor equipments recorded the highest number of learners (31, 10.4%) who were at level one (sedentary or being Stationary or motionless/ making Low intensity movements) while jumping and riding had both recorded the highest percentage (21.5%) of preschool children who were able to jump and ride very fast and vigorous using their body parts. On other loco-motor activities, the majority (28.3%) of preschool children were able to skip vigorous using their body parts (vigorous intensity), majority (32.7 %) of preschool children were able to walk moderately vigorous with their limbs and trunk, majority (29.0 %) of preschool children were able to run vigorous using their body parts (vigorous intensity), majority (30.0%) of preschool children were able to make slow body movement steps while using their limbs and trunk (moderate intensity), majority (29.3%) of preschool children were able to leap with moderate intensity, majority (27.6 %) of preschool children were able to slide with moderate intensity and majority of (26.6%) of preschool children were able to climb with moderate intensity.

The Preschoolers' Ability to Perform Various Rhythmic Movement Activities:

To achieve the objective research went to 42 ECDE centres to observations the children as they performed various rhythmic movement activities. The obtained results are summarised in table 2

Table 2: Performance of learners in rhythmic Movement Activities

Children's Physical activity performance levels assessment	Percentage of Pre-School Pupils In Various Levels			
	Dancing to the rhythms of musical instrument	Clapping and foot stamping to rhythms of music/song	skipping and singing	Chanting and playing musical instrument
L1	9.4	5.4	3.7	9.4
L2	21.5	16.2	19.9	30.0
L3	27.9	33.7	27.9	31.3
L4	26.6	28.6	34.3	20.5
L5	14.5	16.2	14.1	8.8

From table 4.10, the study sought to establish the preschoolers' physical activity performance levels in dancing to the rhythms of musical instrument, Clapping and foot stamping to rhythms of music/song, skipping and singing; and chanting and playing musical instrument. On dancing to the rhythms of musical instrument, the results indicated that the majority of preschool children (27.9%) were able to make moderate body movement with their limbs and trunk, 26.6% of the learners were able to dance vigorously using their body parts and only 14.5% were able to dance very fast and vigorous using their various body parts. The study also found that the majority of preschool children (33.7%) were able to clap and staple their feet moderately while shaking their limbs and trunk while 28.6% of the preschool children clapped and stapled their feet with Vigorous intensity and only 16.2% were able to clap and staple their feet very fast and vigorous while using other body parts. Further the study established that very few (3.7%) preschool children who were motionless while skipping and singing and majority (34.3%) of the children skipped and sang while using their body parts with Vigorous intensity. On the other hand as preschool children were chanting and playing musical instrument, the results indicated that majority (31.3%) of preschool children were able to make slow body movement with their limbs and trunk and only 8.8% of preschool children who were able to make very fast and vigorous movements using their body parts.

Availability of the Outdoor Environment Components and Physical Activity Performance Levels:

The study sought to establish the relationship between the availability of various outdoor equipments and preschool children's ability to perform various physical activities. To achieve this, a correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. Table 3 provides an insight into these bivariate relationships.

Table 3: The Availability of Various Outdoor Equipments and Preschoolers' Ability to Perform Physical Activity

		Availability of the Components of Outdoor Environment	Performing loco-motor activities
Availability of the Components of Outdoor Environment	Pearson Correlation	1	-.051
	Sig. (2-tailed)		.379
	N	297	297
Performing loco-motor activities	Pearson Correlation	-.051	1
	Sig. (2-tailed)	.379	
	N	297	297

The correlation matrix in table 3 displays Pearson Correlations coefficients. The results show the From the result it is evident that there was a relatively weak relationship between relationships between the availability of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various loco-motor activities (stepping, walking, jumping, leaping, skipping, sliding, climbing, running and riding) ($r = -.051$) which is not significant since $P > .005 (-.379)$ according to Garret (2006), this is a weak negative linear relationship between the variables.

During the interview with preschool lead teachers, the following two main themes emerged from the interview. The first theme was on the effect of non-fixed equipment and preschool Children's play activity levels and the second theme was based on the relationship between fixed Playground equipment and Children's playground activity levels and preferences.

On the first theme, majority (34 out of 42) of the preschool lead teachers overwhelming responded on the positive relationship between the availability, adequacy, effectiveness and utilization of non-fixed equipment and the intensity at which preschoolers participated in various outdoor activities. **A teacher said:** *the playground markings in my school increase the levels children's participation in outdoor activities (T33)*. Another teacher also observed: *As you can see my school has many balls and ropes, this make my ECDE children more physically active then last year but when we hand two ball which was shares among primary and ECDE children. These equipments make my children to play with a lot of enjoyment. I think it has a really effect on physical activity (T-09)*.

Availability of the Components of Outdoor Environment and Rhythmic Movement Activities:

To establish the impact of the availability of various outdoor components on preschool children's performance in various physical activity level, the Pearson product moment correlation was administer to the two variable and the SPSS printout results are presented in table 4 as follows.

Table 4: The Pearson Correlations matrix between the Availability of the Components of Outdoor Environment and Rhythmic Activities

Correlations		Availability of the Components of Outdoor Environment	Rhythmic Movement Activities
Availability of the Components of Outdoor Environment	Pearson Correlation	1	.080
	Sig. (2-tailed)		.169
	N	297	297
Rhythmic Movement Activities	Pearson Correlation	.080	1
	Sig. (2-tailed)	.169	
	N	297	297

As reflected in table 4, there was a relatively weak ($r = .080$) relationships between the availability of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various Rhythmic Movement Activities (dancing to the rhythms of musical instrument, Clapping and foot stamping to rhythms of music/song, skipping and singing; and chanting and playing musical instrument). This relationship was not significant since $P > .005 (.169)$ according to Garret (2006), this is a weak positive linear relationship between the variables. In addition, through observation the researcher also found that swings and tyres were available in many schools while slides, see-saws and ladders were very few schools. The available equipments enhanced pupils' activity

Adequacy Outdoor Environment and Activity Performance Levels:

The study further sought to establish the relationship between the **Adequacy** of various outdoor equipments and preschool children's ability to perform various physical activities. To achieve this, a correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. The results are presented in table 5.

Table 5: Adequacy Outdoor Environment and Activity Performance Level

		Adequacy of Rich Outdoor Environment	Performing loco-motor activities
Adequacy of Rich Outdoor Environment	Pearson Correlation	1	.164**
	Sig. (2-tailed)		.005
	N	297	297
Performing loco-motor activities	Pearson Correlation	.164**	1
	Sig. (2-tailed)	.005	
	N	297	297

The correlation matrix in table 5 displays Pearson Correlations coefficients. As represented from the table, the relationships between the adequacy of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various loco-motor activities was relatively weak ($r = .164$). However the correlation is significant at the 0.01 level (2-tailed) since $P < .01 (.005)$ according to Garret (2006), this is a weak positive linear relationship between the variables.

Adequacy of Rich Outdoor Environment and Rhythmic Movement Activities:

The correlation between adequacy of rich outdoor environment in various ECDE centres and preschool children's ability to perform various rhythmic movement activities was computed using Pearson coefficient. The results are presented in table 6 as follows.

Table 6: Adequacy of Rich Outdoor Environment and Rhythmic Movement Activities

	Adequacy of Rich Outdoor Environment	Rhythmic Movement Activities
	Pearson Correlation	1
	Sig. (2-tailed)	.022
	N	297
Rhythmic Movement Activities	Pearson Correlation	.022
	Sig. (2-tailed)	.707
	N	297

The correlation matrix in table 4.14 displays Pearson Correlations coefficients. The relationships between adequacy of rich outdoor environment in various ECDE centres and preschool children's ability to perform various rhythmic movement activities was relatively weak ($r = .022$). The results further shows that the relationship was not significant since $P > .005(.169)$ (Garret, 2006).

During the interview with preschool lead teachers, majority (32 out of 42) of the teachers observed that providing adequate portable equipments within preschool outdoor environment greatly influenced preschool children's activity performance levels. For example some teachers observed: *when we take all the loose materials out for our children to use during outdoor play, my children become more active than when we take, for example two balls to be shared among the pupils in the whole class (T-34)*. Another teacher added: *The adequacy of outdoor equipments in preschool outdoor environment influences children's opportunities for physical activity participation. The aim of providing play equipments is to increase children physical activity levels and decrease the chances of children's involvement in low intensity outdoor activities (T-17)*

Effectiveness of Outdoor Environment components and Activity Performance Levels:

The study further sought to establish the relationship between the effectiveness of various outdoor equipments and preschool children's ability to perform various physical activities. To achieve this, a correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. The results are presented in table 7.

Table 7: Effectiveness of Outdoor Environment Components and Activity Performance Levels

	Effectiveness of Outdoor Environment to Preschoolers	Performing loco-motor activities
Effectiveness of Outdoor Environment to Preschoolers	Pearson Correlation	1
	Sig. (2-tailed)	.280**
	N	.000
Performing loco-motor activities	Pearson Correlation	.280**
	Sig. (2-tailed)	.000
	N	297

The correlation matrix in table 7 displays Pearson Correlations coefficients. As represented from the table, the relationships between the effectiveness of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various loco-motor activities was relatively weak ($r = .280$). However, the linear relationship is significant at the 0.01 level (2-tailed) since $P < .01(.000)$ (Garret, 2006). This implies that by improving the effectiveness of various components of outdoor environment in ECDE centres, the preschool tend to improve their abilities to performing various loco-motor activities.

Effectiveness of Outdoor Environment to Preschoolers and Rhythmic Movement Activities

The study further sought to establish the relationship between the **effectiveness** of various outdoor equipments and preschool children's ability to perform various rhythmic movement activities. To achieve this, a correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. Table 8 provides an insight into these relationships.

Table 8: Effectiveness of Outdoor Environment and Preschoolers' in Performing Various Rhythmic Movement Activities

		Effectiveness of Outdoor Environment to Preschoolers	Rhythmic Movement Activities
Effectiveness of Outdoor Environment to Preschoolers	Pearson Correlation	1	.190**
	Sig. (2-tailed)		.001
	N	297	297
Rhythmic Movement Activities	Pearson Correlation	.190**	1
	Sig. (2-tailed)	.001	
	N	297	297

As reflected in table 8, there was a relatively weak ($r = .190$) relationships between the effectiveness of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various Rhythmic Movement Activities (dancing to the rhythms of musical instrument, Clapping and foot stamping to rhythms of music/song, skipping and singing; and chanting and playing musical instrument). However, according to Garret (2006), this is a positive linear significant relationship since $P > .005(.001)$.

The Site of the Outdoor Environmental components and loco-motor activities:

The correlation between the site of rich outdoor environment in various ECDE centres and preschool children's ability to perform various loco-motor activities was computed using Pearson coefficient. The results are presented in table 9 as follows.

Table 9: Site of the Outdoor Environmental Components and Preschoolers' Performance in Loco-Motor Activities

		The Site of the Outdoor Environmental	Performing loco-motor activities
The Site of the Outdoor Environmental	Pearson Correlation	1	.044
	Sig. (2-tailed)		.448
	N	297	297
Performing loco-motor activities	Pearson Correlation	.044	1
	Sig. (2-tailed)	.448	
	N	297	297

The correlation matrix in table 9 displays Pearson Correlations coefficients. The relationships between site of rich outdoor environment in various ECDE centres and preschool children's ability to perform various loco-motor activities was relatively weak ($r = .044$). The results further shows that the relationship was not significant since $P > .005(.448)$ (Garret, 2006). This is an indication that the site of various outdoor components has no significant effect on the preschool children's ability to perform various loco-motor activities.

The Site of the Outdoor Environmental components and Rhythmic Movement Activities:

The study also sought to establish the relationship between the site of various outdoor equipments and preschool children's ability to perform various rhythmic movement activities. To achieve this, a correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. The results are presented in table 10.

Table 10: Site of the Outdoor Environmental Components and preschoolers' Performance Rhythmic Movement Activities

		The Site of the Outdoor Environmental	Rhythmic Movement Activities
The Site of the Outdoor Environmental	Pearson Correlation	1	.111
	Sig. (2-tailed)		.057
	N	297	297
Rhythmic Movement Activities	Pearson Correlation	.111	1
	Sig. (2-tailed)	.057	
	N	297	297

As reflected in table 10, there was a relatively weak ($r = .111$) relationships between the site of various components of outdoor environment in ECDE centres and the ability of preschool children's to Performing various rhythmic movement activities (dancing to the rhythms of musical instrument, Clapping and foot stamping to rhythms of music/song, skipping

and singing; and chanting and playing musical instrument). The results further shows that the relationship was not significant since $P > .005(.057)$ (Garret, 2006). This is an indication that the site of various outdoor components has no significant effect on the preschool children's ability to perform various rhythmic movement activities.

The joint effects of the site, availability, adequacy and effectiveness of various outdoor components on preschool children's ability to perform various loco-motor activities:

To achieve this, linear regression was calculated to assess the joint effects of the site, availability, adequacy and effectiveness of various outdoor components on preschool children's ability to perform various loco-motor activities. The results are presented in table 11.

Table 11: The state of outdoor components and Preschool Children's Ability to Perform Various Loco-Motor Activities

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.356 ^a	.127	.115	7.662

From table 11, the hierarchical regression analysis was performed where the site, availability, adequacy and effectiveness of various outdoor components were regressed on the preschool children's ability to perform various loco-motor activities. The result shows that the R^2 value was .127. This indicates that when all the four state (the site, availability, adequacy and effectiveness) combined together explained only 12.7% of the variance in the preschool children's ability to perform various loco-motor activities while 87.3 % of the variations can be explained by other factors other than the state of the outdoor component.

The Pearson Correlations Matrix of The State Of Outdoor Components and Preschool Children's Ability to Perform Various Loco-Motor Activities:

The study further sought to establish the better predictor of loco-motor activities among the four state of outdoor examined by the current study (site, availability, adequacy and effectiveness). The correlation matrix is presented in table 12 as follows.

Table 12: The correlation matrix

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	21.364	2.041		10.469	.000
Availability of the Components of Outdoor Environment	-.187	.050	-.234	-3.722	.000
Adequacy of Rich Outdoor Environment	.025	.191	.012	.130	.897
Effectiveness of Outdoor Environment to Preschoolers	.355	.073	.485	4.828	.000
The Site of the Outdoor Environmental	-.197	.175	-.125	-1.130	.259

a. Dependent Variable: performance of various loco-motor activities:

Table 12 show the results of the joint effect of the availability, adequacy, effectiveness and the site of the outdoor environment components on the preschool children's performance of various loco-motor activities. the beta values of -.234 for the availability of the components of outdoor environment, .012for the adequacy of rich outdoor environment, .485 for the effectiveness of outdoor environment to preschoolers and -.125 for the site of the outdoor environmental indicates that the effectiveness of outdoor environment to preschoolers predicts the preschool children's performance of various loco-motor activities than the other three independent variables.

The State Of Outdoor Components and Preschool Children's Ability to Perform Various Rhythmic Movement Activities:

Hierarchical regression analysis was performed where the site, availability, adequacy and effectiveness of various outdoor components were regressed on the preschool children's ability to perform various Rhythmic Movement Activities. The results are presented in table 13 as follows.

Table 13: The state of outdoor components and preschool children's ability to perform in Various Rhythmic Activities

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.259 ^a	.067	.054	3.501

The results show that the R² value was .229. This indicates that when all the four state (the site, availability, adequacy and effectiveness) combined together explained only 22.9% of the variance in the preschool children's ability to perform various rhythmic movement activities while 77.1 % of the variations can be explained by other factors other than the state of the outdoor component.

The Pearson Correlations matrix of the state of outdoor components and preschool children's ability to perform various Rhythmic Movement Activities:

The study further sought to establish the better predictor of the preschool children's ability to perform various Rhythmic Movement Activities among the four state of outdoor examined by the current study (site, availability, adequacy and effectiveness). The correlation matrix is presented in table 14 as follows.

Table 14: The correlation matrix of the State of the Outdoor Components and preschool pupil's ability to perform various rhythmic Movement Activities

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	10.510	.933		11.270	.000
Availability of the Components of Outdoor Environment	.007	.023	.020	.312	.756
Adequacy of Rich Outdoor Environment	-.243	.087	-.275	-2.788	.006
Effectiveness of Outdoor Environment to Preschoolers	.117	.034	.360	3.472	.001
The Site of the Outdoor Environmental	.019	.080	.028	.242	.809

a. Dependent Variable: preschool pupils' ability to perform various Rhythmic Movement Activities:

Table 14 shows the results of the joint effect of the availability, adequacy, effectiveness and the site of the outdoor environment components on the preschool children's performance of various rhythmic movement activities. the beta values of .020 for the availability of the components of outdoor environment, -.275 for the adequacy of rich outdoor environment, .360 for the effectiveness of outdoor environment to preschoolers and .028 for the site of the outdoor environmental indicates that the effectiveness of outdoor environment to preschoolers predicts the preschool children's performance of various rhythmic movement activities than the other three independent variables.

The current findings are supported by a study by Farley, Meriwether, Baker, Rice, & Webber (2008) which sought to establish the effect of the availability of playground equipment on physical activity performance levels of children in free play study The study found that pupils in outdoor areas with more fitted equipment improved physical activity far higher than in areas with open grassy outdoor space. These findings are further supported by a cross-sectional study done by Ridgers, Fairclough, & Stratton (2010) in the City of Liverpool UK that investigated the relationship between a series of recess variables and pupils' physical activity levels. The study sampled 128 children boys aged 9 to10 years old from eight schools. The physical activity performance levels of the learners were observed during Play using SOCARP (System for Observing Children's Activity and Relationships). The study found that there was a positive relationship between the availability of outdoor equipment children's activity levels. In addition, when the outdoor space per child improved, the physical activity levels improved.

The current findings are supported by a study by Staempfli (2009) on benefits of adventure in children's outdoor play environments. The study found that adventurous playgrounds made children more active. This study adds value on the use of natural environment outdoor because of its positive influence on children's physical activity. The study result further indicated that adventurous outdoor play environments offer opportunities for children to grow physically, emotionally and socially. These findings are the same with the current one.

4. CONCLUSION

4.1 Conclusion:

The preschool children were assessed on their abilities to perform various loco-motor activities and rhythmic movement activities. The study established a relatively weak relationship between the availability of various components of outdoor environment in ECDE centres and the ability of preschool children's ability to Performing various loco-motor activities (stepping, walking, jumping, leaping, skipping, sliding, climbing, running and riding) and Rhythmic Movement Activities (dancing to the rhythms of musical instrument, Clapping and foot stamping to rhythms of music/song, skipping and singing; and chanting and playing musical instrument). The joint effect of the availability, adequacy, effectiveness and the site of the outdoor environment components on the preschool children's performance of various loco-motor activities indicated that the effectiveness of outdoor environment in various ECDE centres better predicted the preschool children's performance in various loco-motor activities and Rhythmic Movement Activities than the other three other three predictors.

4.2 Recommendations:

Based on conclusions, the study makes the following recommendations:

Recommendations for the Policy Maker (Ministry of Education):

For the head teachers in the field, regular in- service may be necessary so that they are updated with current trends relevant to preschool education. This will make them aware of the children's rapidly changing world from which their learning experiences emanate.

The government should have in place policy guidelines to all pre-schools with regard to the availability, adequacy site and effectiveness of outdoor environment.

Recommendations For Head Teachers

The Head teachers should:

- i. Have in schools policies on monitoring and ensure that their pre-school children are involved in outdoor activities
- ii. Head teachers should regularly assess and monitor children's learning and development.

Recommendations for the ECDE Teachers:

The ECDE teachers should:

- i. Participate in outdoor play as well as involving all children in participating in outdoor play.
- ii. Enrich the ECDE learning environment with locally available teaching and learning support materials

Preschool Institutional Recommendations:

A safe outdoor environment should have a strong focus on outdoor activities that enhance the physical and psychological growth and development of the pre schools, while at the same time ensuring children's safety in the outdoor environments. Preschool lead teachers and primary head teachers should be tasked to:

- i. Provide adequate, safe and secure outdoor environment where children can effectively participate in outdoor activities and thus acquire physical and psychosocial skills.
- ii. Ensure maintenance inspection and servicing of the playgrounds, play equipment and materials are intensified as a way of monitoring and appraising the safety status of the playgrounds.
- iii. Teachers and administrators should ensure equipments are securely fixed and are in good condition to meet children's need for safety.

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