# COMPARATIVE STUDY BETWEEN THE USE OF BUTTONS AND VELCRO FASTENER IN PRODUCTION AND USE OF CLOTHING FOR PRE-SCHOOL CHILDREN IN FEDERAL CAPITAL TERRITORY – ABUJA

**By:**

**Aminat Bint AHMAD**

**(M.ED/EDUC/06809/2008/2009)**

**SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES IN FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF EDUCATION DEGREE (M.ED) IN HOME ECONOMICS (CLOTHING AND TEXTILE)**

**AHMADU BELLO UNIVERSITY**

**ZARIA.**

**MARCH, 2014.**

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**MARCH, 2014.**

# DECLARATION

This Thesis titled "The Use of Velcro in the Production of Clothing for Pre-School children in Federal Capital Territory-Abuja" has been undertaken by me in the Department of Vocational and Technical Education under the supervision of Dr. (Mrs) M. F. Ahuwan and Dr. (Mrs) S. L. Ajayi. The information derived from literature has been duly acknowledged in the text and a list of references provided. No part of this Thesis has been presented for the award of another degree at any university.

| AMINAT BINT AHMAD | _____ | _____ |
|---|---|---|
| Name of student | Signature | Date |

## CERTIFICATION

This Thesis titled "The Use Of Velcro In Production Of Clothing For Pre-School Children In The Federal Capital Territory, Abuja" by Ahmad, Aminat Bint meets the regulations governing the award of the degree of M.ED, Home Economics Education of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

| | | |
|---|---|---|
| Dr. (Mrs) M.F. Ahuwan<br>Chairperson, Supervisory Committee | _____<br>Signature | _____<br>Date |
| DR. (Mrs) S.L. Ajayi<br>Member, Supervisory Committee | _____<br>Signature | _____<br>Date |
| Prof A.A Udoh<br>Head of Department,<br>Vocational and Technical Education | _____<br>Signature | _____<br>Date |
| Prof. A.A Joshua<br>Dean, school of post graduate studies,<br>Ahmadu Bello University, Zaria. | _____<br>Signature | _____<br>Date |

## DEDICATION

This work is dedicated to my beloved husband, Mallam M.Z. Mazai.

## ACKNOWLEDGEMENT

The researcher sincerely expresses her gratitude to the Almighty Allah for His Divine faithfulness, provision, protection, guidance and knowledge throughout the course of this study.

The researcher unreserved appreciation goes to her chairperson, supervisory committee, Dr. (Mrs) M.F. Ahuwan, who maintained keen interest, made constructive criticism, gave useful suggestion and incredible guidance for the success of this work. The researcher gratitude goes to Dr. (Mrs) S.L. Ajayi, her second supervisor, for her contribution and support to this work.

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# ABSTRACT

The purpose of the study was to experiment on the use of Velcro as a suitable fastener in the production of clothing for pre-school children in Federal Capital Territory, Abuja. Three objectives and three research questions were formulated with three related null hypotheses. Experimental research design was adopted for the study. The population of pre-school children, that is, early child care centres in Abuja was 5066 and the sample size was sixty. Purposive sampling technique was used in selection of two schools for the experiment, while random sampling technique was used for the selection of the samples. Descriptive statistics of frequency distribution and percentage were used for analyzing personal data of the respondents. Mean and standard deviation were used to answer the three research questions raised in chapter one. Independent t-test was used to test null hypotheses one, two and three at 0.05% level of significance. The findings revealed that there was significant difference in the time used for wearing and undressing uniform constructed with Velcro. The time was shorter than the time used for wearing and undressing uniform constructed with button. . It was concluded that Velcro has been ascertained as an effective fastener on pre-school children garment for self dressing and undressing.

Based on the finding, it was recommended that parents should endeavour to use Velcro fastener in the openings of pre-school children garments for its suitability and convenience for the children. Headmasters and teachers of pre-school children centers should be adequately involved in encouraging the sewing of pre-school uniforms with Velcro in the openings as it will help them solve the problems of undressing and dressing of the children when they are in need of toileting

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## OPERATIONAL DEFINITION OF TERMS

VELCRO: is a type of fastening that is in form of a fabric with a hook and loops in which the hook side is a piece of fabric covered with tiny hooks, whose loop side is a piece of fabric covered with smaller hair that are even in nature.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background to the Study

The term Velcro is a registered trademark in most countries. It is a type of fastening that is in form of a fabric with a hook and loops in which the hook side is a piece of fabric covered with tiny hooks, whose loop side is a piece of fabric covered with smaller hair that are even in nature. When the two sides are pressed together, the hooks catch in the loops and hold the pieces together, but when the layers are separated, the strips make a characteristic of ripping sound (De Mestral, 1941). According to Wingate (1975) Velcro is a trademark for a completely textile closure of hook-like nylon pile fabric to an opposing nylon pile. Microsoft Encarta (2009) also defined Velcro as a trademark for a fastener consisting of two strips, one with a dense layer of tiny nylon hooks and the other of loops that interlock with them which can be used, for outer wear, athletic shoes and luggage. It can also be used in place of buttons, hooks, snaps, zippers and shoelaces.

Velcro's fabric strips have interlocking surfaces: one surface consisting of tiny nylon hooks, while the other one consists of clinging piles which can be easily unfastened by peeling one surface away from the other surface, roots in two French words: vel comes from velour meaning "velvet" and cro from crochet meaning "hook". Features of Velcro which makes it an ideal fastener are many uses which include lightweight and durable, maintaining its function even after thousands of fastenings and unfastening; they resist being pulled apart sideways or straight up and down though Velcro's two strips can easily be pulled apart by peeling back one strip. A Velcro connection also stays strong when

wet, the strength increases dramatically with the area of contact. The entertainers who hurl themselves at walls of Velcro have demonstrated that the material is strong enough to hold up human bodies (Microsoft Encarta, 2009).

Okeke (2009) said that Velcro can be used for sportswear especially at the waist, pajamas and others. It is easy to use and very suitable for making disabled persons, actors and children clothes. Okeke further added that Velcro strip can be stitched on each side of the tapes on over and under wraps and holds the opening together by being pressed together. It fastens because the under wrap has a mesh of tiny nylon loops and the under wrap has a dense nylon pile that when pressed together it "locks". Therefore, when Velcro is used, it should be stitched in place before the facings are completed.

Clothing has been discovered to be one of the earliest primary needs of the people of the universe including pre-school children. According to Abraham Maslow hierarchy of needs, laws and recorded history, clothing along with food and shelter have been recognized among the primary needs of mankind, that is, physiological need. Clothing encompasses a wide variety of materials that cover the body. Anyakoha and Eluwa (2008) stated that good basic clothing is for protection and adornment and each family member requires good basic Clothing, including pre-school children. Clothing is also viewed as any article placed on the body in order to protect, beautify or adorn the body.

Pre-school as classified by Karen (1996) are children between three and five years of age. They are in between the Toddlers and school age of people in the family. Ross (2009) said that pre-school children are now viewed by developmental scientists as deeply interested in how others believe, feel and desire compared with their own.

In support is the pre-school child that looks at the mother after dressing and says' mummy please buy this type of dress for me. Essa (1999) viewed pre-schools as the largest segment of children in early childhood programs, which include youngsters from two or three years of age until they begin formal schooling. But some programs consider pre-school period as beginning at age three while others enroll children once they are out of diapers. Rathus (2006) said that the major developmental task of the child from ages 2 to 3 is acquiring a sense of autonomy and independence from parents. This can be clearly seen when the child is beginning to dress and undress itself.

Mothers and teachers of pre-school children have experienced and observed that pre-school children find it difficult to dress and undress themselves independently due to either the type of fasteners and opening on their garments which cannot be manipulated by the child. This aspect can be frustrating to the child or the parent. Such problems are lack of methods and knowledge of the convenient way to fastening up and unfastening garment during the process of dressing and undressing their clothes. Lack of this skill could be attached to the level of development especially on the coordination of some common fasteners seen existing on pre-school children clothing such as buttons and button holes, buttons and loops, Rouleau loop and buttons, snaps or press stud. These fasteners are normally not easy for pre-school children to open and close, therefore they end up messing up their clothes, cut off their buttons when struggling to open; especially when they are pressed, that is, when they want to use the toilet.

Some children chew the buttons in place of sweet due to their colour or attractiveness. This can be a health hazard. Some pre-school children come back home without their shirt, on their body and shoe buckle off during the process of buckling their sandals.

Opening to their shirt sleeve and neck are left open when coming back home hence they lack the skill of fastening them after managing to pull open with force when they are in need of the openings. As a result of the above problems the researcher decided to experiment the use of Velcro on the pre-school children dress opening for easy opening and closing. In line with the researcher's view is Webber (1990) who saw Velcro as hook and loop tape in which the tapes are tiny hooks on the other strip that can be pressed together and pulled apart very easily, use in small pieces to replace a zipper or provide an adjustable closing, apply at seam of parts to permit easier dressing over a cast or brace. Neal (2000) also said that fastenings of garments should last as the garments they serve providing they are chosen and attached correctly. According to Weber (1990), sewing for kids of pre-school age involves the use of hook and loop fasteners instead of buttons and buttonholes. This makes it easier for young children to dress themselves. If desired, decorative buttons can be sewn on the outside of the garment, on top of the fasteners.

The use of Velcro in the production of clothing for pre-school children in Abuja, the Federal Capital Territory (FCT) in Nigeria, has automatically indicated the class of children the researcher is intending to work with which is the pre-school children who are children between the age of three and five years old with problem of self dressing. Aldrich (2006) said that children's wear was no longer a neglected area of design in Britain. The designer must understand the requirements and the life styles of children at different ages. It is easier to start the young child with undressing rather than dressing. Where both parents are working, it makes mornings too hectic for initial dressing learning experiences for the child with dressing. It is due to this background that this

study set out to experiment the use of Velcro in the production of clothing for pre-school children to access easy dressing and undressing.

## 1.2 Statement of the Problem

Independent dressing and undressing by children of pre-school age have been identified as problematic. They find it difficult to dress and undress themselves easily due to the type of fastener on their garment. This area of pre-school clothing calls for a serious attention. It has been observed that pre-school children are faced with problems of self dressing and undressing, as such pre-school children need clothing with proper construction, suitable fastenings such as Velcro for easy assessment so as to provide answers to pre-school teachers' questions. Such nagging questions include: when will these pupils be able to remove and wear their dresses independently, when going to the toilet? These are related to the objectives of clothing and textiles: to develop the skills, to draft simple patterns for garment making, construct and renovate different articles of clothing using the different articles of clothing, different processes and features. Hence this study will involve drafting of the patterns for garment making, construct articles like pre-school uniform with Velcro to improve pre-school children's dressing skills.

In addition, the researcher's interaction with pre-school children mothers in FCT Abuja revealed that pre-school children clothing with buttons, zips and press studs as fasteners on their dresses opening are not too convenient for the children; some of them end up cutting away their buttons when they wanted to go to toilet and sometimes when they felt hot while some children came back home from kindergarten schools with their clothes being messed up. Okeke (1990) pointed out that due to the technological advancement in the world, many pre-school children's garments are being produced but these garments

did not stress simplicity, comfort, ease of care, self-help and made no adequate allowance for growth.

It is based on these problems with pre-school clothing that the researcher has decided to experiment the use of Velcro (as fastener) in the production of clothing for pre-school children in Abuja-FCT in Nigeria.

## 1.3 Objectives of the Study

The major objective of this study is to examine the use of Velcro in the production of clothing for pre-school children in FCT- Abuja in Nigeria. The specific objectives are to:

1. produce garments for pre-school children using Velcro fastener in all the openings for convenient self dressing.
2. compare the time used for wearing Uniform constructed with Velcro fasteners and the time used for wearing Uniform constructed with button fastener by pre-school children.
3. ascertain time used for undressing Uniform with Velcro and time used for undressing Uniform with button fastener by pre-school children.

## 1.4 Research Questions

This study provides answers to the following research questions

1. To what extent are the garments produced using Velcro fastener convenient for pre-school children self dressing?
2. To what extent can the time used for wearing Uniform constructed with Velcro fastener be better than the time used for wearing Uniform with button fastener for pre-school children?

3. To what extent can the time used for undressing uniform constructed with Velcro fastener be better than the time used for undressing uniform with button fastener by pre-school children?

## 1.5 Research Hypotheses

The following null hypotheses were postulated based on the research questions, to enable the researcher arrive at meaningful conclusions.

1. There is no significant difference between the garment produced using Velcro fastener and garment produced using button fastener for pre-school children's convenient self dressing.
2. There is no significant difference between the time used for wearing uniform with Velcro fastener and time used for wearing uniform with button fastener by pre-school children.
3. There is no significant difference between the time used for undressing uniform constructed with Velcro fastener and the time used for undressing uniform constructed with button fastener by pre-school children.

## 1.6 Significance of the Study

The findings of this study will be of great importance to the pre-school children's teachers as it will help them solve the problem of undressing and dressing of the children when they are in need of toileting. It will equally be useful to the parents of preschool children, as it will save them time and energy resources they would have used to undress the children and dress them on their uniform while they are also preparing for work.

The preschool children will as well benefit as it will enable them to dress and undress whenever they are in need leading to their psychological comfort and stability for learning.

It will also be useful to seamstress, tailoring and children cloth designers as it will create new way of designing children cloth for easy assessment. It will also be useful to Velcro producers, wholesalers and the retailers as it will improve the sales and consumption of the product. It will also be useful to present parents and future parents (that is those that are yet to be parent) to be able to manage time resource adequately, in combining pre-school parental roll work and as well school on their own, when adding another qualification to theirs.

It will also serve as economical benefit to preschool children's parents hence there will be no more constant replacement of spoilt fasteners.

## 1.7 Basic assumptions of the Study

The basic assumptions for this study are that

a. inability of preschool children self dressing and undressing is as a result of unsuitable fastener used.
b. pre-school children's ability to dress and undress for themselves will be enhanced with the use of Velcro fastener
c. fasteners on pre-school children clothing do not consider the safety, comfort and accessibility of them.

## 1.8 Delimitation of the Study

This study was delimited to selected pre-school children between 3 to 5years old from Early Child Care Centres in Abuja- FCT in Nigeria. Hence pre-school children find it difficult to dress and undress themselves easily. It was also delimited to the use of Velcro fastener as being considered as suitable fastener for pre-school clothing, since pre-school children are with problems of dressing and undressing for themselves with button fastener. It was

delimited to Early Child Care Centres 2 (ECC2) of Abaji East primary school and Sabon-gari primary school in Abaji Local Education Authority in Abuja-FCT in Nigeria because, the pre-school age of interest to the standard study fell on ECC-2 as well as for easy conduction of the experiment.

# CHAPTER TWO

## REVIEW OF RELATED LITERATURE

This research study focused on the use of Velcro in the production of clothing for pre-school children from age 3-5 years old. Relevant Literatures were critically reviewed for the purpose of the study under the following sub-headings.

2.1 Theoretical Framework on Designing Children Clothing

2.2 Concept of Velcro

2.3 Historical Development of Velcro

2.4 Importance of Velcro as a Clothing Fastener

2.5 Concept of Pre-school Children's Clothing

2.6 Characteristics of Pre-school Children

2.7 Clothing and Self dress

2.8 Factors to be Considered when Producing Clothing for Pre-school Children

2.9 Empirical Studies.

2.10 Summary of the Reviewed Literature.

## 2.1 Theoretical frame work on child development

The best-known theory of cognitive development was developed by Swiss psychologist Jean Piaget, who became interested in how children think and construct their own knowledge. Based on his studies and observations, Piaget theorized that children proceed through four distinct stages of cognitive development: the sensorimotor stage, the preoperational stage, the concrete-operational stage, and the formal-operational stage.

During the *sensorimotor stage,* which lasts from birth to about age 2, understanding is based on immediate sensory experience and actions. Thought is very practical but lacking in mental concepts or ideas. In the *preoperational stage,* which spans the preschool years (about ages 2 to 6), children's understanding becomes more conceptual. Thinking involves mental concepts that are independent of immediate experience, and language enables children to think about unseen events, such as thoughts and feelings. The young child's reasoning is intuitive and subjective. During the *concrete-operational stage*, from about 7 to 11 years of age, children engage in objective, logical mental processes that make them more careful, systematic thinkers. Around age 12 children attain the *formal-operational stage,* when they can think about abstract ideas, such as ethics and justice. They can also reason about hypothetical possibilities and deduce new concepts.

According to Piaget, children progress through these four stages by applying their current thinking processes to new experiences; gradually, they modify these processes to better accommodate reality. This occurs not through direct instruction, but rather through the child's

own mental activity and internal motivation to understand. *Information-processing theories* are based on similarities between the human mind and a computer, both of which are high-speed information-processing devices. These theories describe cognitive growth as the gradual acquisition of more sophisticated strategies for organizing information, solving problems, storing and retrieving knowledge, and evaluating solutions. Like Piaget, information-processing theorists believe that children acquire these skills through their everyday efforts to understand and master intellectual challenges.

Cognitive theories provide insights into how a child's mental processes underlie many aspects of his or her development. However, critics argue that Piaget underestimated the sophistication of the cognitive abilities of young children. Information-processing theorists have also been faulted for portraying children as little computers rather than as inventive, creative thinkers.(Microsoft ® Encarta ® 2009. © 1993-2008 Microsoft Corporation. All rights reserved.)

Piaget theories is related to this study in the area of child's mental processes underlie many aspects of his or her development such as pre-school children that has not acquire the skills of dressing and undressing especially when the garment has some form of fasteners like buttons and zippers.

## 2.2 Concept of Velcro

A fastening is a method used to hold together the opposite matching parts of a garment. A well made garment may be spoilt by badly made fastenings, if they are intended to be invisible they should be made so, by means of press-studs, hooks and eyes, hooks and loops (Velcro),

placing them in an inconspicuous seam or under folds and where they are intended to be visible, they should be made so perfectly and they include buttons and button holes, buttons and loops, zip fasteners etc. Whatever the form of fastenings, their positions should be spaced carefully with a tape measure and marked (Okeke, 2009). Velcro is seen as a brand name of fabric hook and loop fasteners which consists of two layers. Loops side is a piece of fabric covered with evenly smaller and hairy loops, while hook side is a piece of fabric covered with tiny hooks, when the two sides are pressed together, the hooks catch in the loops and hold the pieces together and when the layers are separated, the strips makes a characteristic ripping sound. Velcro hook the first sample was made of cotton, which proved to be impractical while Nylon and Polyester are the fibers most commonly used now and Velcro fasteners made of Teflon loops, polyester hooks and glass backing are used on space shuttles.

There are variations on the standard of Velcro hook and loop fastener: one of which includes hook on both sides. However these are not common, some alternatives to Velcro brand fasteners are buttons, zippers, laces and buckles. (Wikipedia the free encyclopedia 2011). Okeke (2009) said that Velcro is used for sportswear especially at the waist, pajamas etc. it is easy to use and very suitable for making disabled person's clothes, actors and children. Velcro strip can be stitched each side of the tapes on over and under-wraps, and holds the opening together by being pressed together. It fastens because the under wrap has a mesh of tiny nylon loops, and the over wrap has a dense nylon, pile and when pressed together it locks, when Velcro is used it should be stitched in place before the facings are completed.

Watts (1981) referred to Velcro as a self-fastening tape that is commercially produced in 2.5cm wide strips available in a range of colors. The fastening is made in two separate strips that grip together. One side is covered with small hooks; the other side has a soft looped surface.

Directions are given on the pack for stitching. This is a time saving fastening with a wide variety of uses. Weber (1990) saw Velcro as Hook and Loop Tape in which the tape is with tiny hooks on one strip and loops on the other can be pressed together and pulled apart very easily, used in small pieces to replace snaps or buttons, used in longer strips to replace a zipper or provide an adjustable closing. Applied at seam of pants or sleeve to permit easier dressing over a cast or brace. Neal (2000) said that fastenings of garments should have as long life as the garments they serve, providing that they are chosen and attached correctly.Neal(2000) added that Fastenings chosen should be suitable for the:-

a) garment (Zip Fasteners in skirts buttons and button holes in pajamas).
b) material (loops and buttons for fraying materials, button holes and buttons for firmer ones).
c) position (buttons and loops where edges meet, buttons and buttonholes where they overlap).
d) age of the wearer (ribbons for babies' garments, 'Velcro' for children's garments). Watts(1981) also said that whatever the fastening chosen, the method of attaching should comply with the following rules:
    I. Fastenings should always be sewn on to double material.
    II. They should be as inconspicuous as possible unless used as decoration.
    III. If the garment is likely to be washed, fastenings should also be washable (e. g. covered buttons should have washable, rustles moulds).

Musheno (1977) said that Velcro as Nylon closure tape consists of two strips, one faced with minute hooks and one with pile, that intermesh when pressed together. It can be an indispensable aid for light weight, jam proof fastenings according to (Wingate, 1975): Velcro is a trade mark

for a completely textile closure of hook-like nylon pile fabric to an opposing nylon pile. Microsoft Encarta (2009) considered Velcro as a trade mark for a fastener consisting of two stripes, one with a dense layer of tiny Nylon strips, one with a dense layer of tiny nylon hooks and the other of loops that interlock with them used for outerwear, athletic shoes and luggage.

## 2.3 Concept of Pre-School Children's Clothing

Children become aware of the clothes to wear and realize that it will bring them attention and approval from adult and their clothing appears to be an extension of the concept of self. Therefore it would be seen that when boys and girls are dressed appropriately to their sexes, they are identify as future men and women, and they grow up feeling more comfortable with their roles. Some parents may prefer to minimize sexual differences by dressing boys and girls in similar clothes hoping that they are fostering the optimum development of the child as a human being without the limitations imposed by sex roles. There must be a total different approach in designing for the pre-school child, as compared to younger children. In contrast to the toddler, the child from three to five years is an individual who is aware of clothing and has quickly developed some very definite preferences and opinions. Pre-school children like brighter colours, soft interesting textures, basic comfort, clothing which is easy to get in and out of it and that which is similar to what other children are wearing. Bringing up children can be great fun if one has reference knowledge about how they grow. It is similarly important to have reasonable self-confidence that one can help children to acquire comfortable and effective garment for their different age groups (Craig, 1973).

According to Iton (1988) and Bature (1992) rapid growth in pre-school children has contributed to some of the funny clothes worn by pre-school children especially in large families

that tried to keep cost of clothing expenditure at minimum stage, so that they purchase larger size of garment for pre-school children grow into and fit. This does not only arrest the pre-school children's movement but also affect them due to their physical development have brought about various sizes and ranges. It will be improper to generalize the rate of growth in children, though the size and range is related to the age of the child, yet one should realize that children vary greatly in height and weight at any given age according to their genetic heritage, nutritional status and other environmental influences.

Garner (1996) stated that pre-school children at this age gradually learn from three to five years is very much aware of colour. Garner further explained that pre-school child is a major problem for many families due to their need to climb, jump, run, carry and push with ease demands that clothes should be flexible and not binding, warm but not hot, absorbed and easily cleaned, soft and yet durable, easy to put on and take off, conducive for self help and independent, attractive in design and fabric, adaptable to frequent toileting and adjustable to rapid growing body. The customary behavior of six to twelve years old child cover wide range alternating between quietness and noisiness, moodiness and hilarity adult and infantile, it is understood that suitable clothes help to make childhood a happy time.

Okeke (1990) considered children's clothing as a relatively new idea as different fashions for children nowadays where non-existent until late in history pre-school children were often dragged into large stores only to find a dreary range of repetitive styles. The loathsome fact for them was to wear that or nothing gradually the fashion industry became aware of this neglected area and manufacturers began to realize how discerning children actually were.

Mildred and Oris (1979) in Anya (1991) remarked that well designed clothes will have the features that will make them more suitable for children. The fabric must be colorful, attractive and durable as the need may be and suitable for the design, wear, occasion, season and climate. The right fabric makes the designers work easier and more rewarding, for it is from the fabric that the designer can select and develop style. A child at the early stage is not aware of the design of his clothing as long as it is not a source of discomfort. Pre-school children's wear, are made attractive by the fabrics designs and trimmings, in as much as one considers the comfort and wear ability of pre-school children's apparel; it should also meet the wearer. Weber (1990) emphasized that parents should purchase or make clothing appropriate for the age of the child. For an infant, snaps should be installed in the legs to make diapers changes quick and easy.

It does not matter how great an outfit looks, if you have to pull it over a crying baby's head six times a day, you will pick a different outfit next time pre-school clothing should be made simple so that they can dress themselves without difficulty. Use elastic waist band rather than fly zippers and buttons to reduce frustration during those mad dashes to the bathroom or during potty training. Pre-school children's garments should be simple with minimum attachments but generally mothers attempt to dress their children in extravagant designs that make the child look ridiculous. According to Karen (1996), the development of the child from infancy to the age of toddler, the pre-school years through school age and adolescence were outlined as the growth and development of children settles into a gradual pace of steady gain in both physical and mental stature. Intelligent selection of clothing for infants and small children is predicated upon on understanding of physical growth and development during the early years.

There is great variation among infant in size at birth and the growth of the baby during the first year is very rapid and as the child grows his body proportions change also. In infancy the head

grows relatively rapidly, while in pre-school years head growth is slow, limb growth is rapid and trunk growth is intermediate till the time the child reaches his sixth birthday his body proportions are much like those of an adult. Karen (1996) further said that not only in the selection of clothing for infant and small children that is affected by the pattern of rapid growth, but other developmental processes influence clothing needs. The time the baby is three or four month old, the baby can sit to crawl, at nine to fourteen months the child is able stand alone, at fifteenth months most children can walk and during the next few years the child perfects his walking and climbing skills and gains increasing control over the body.

Aldrich (2006) observed that the designer must understand the requirements and life style of babies and children at different ages. Changes in the social culture have generated the growth of children's departments directed by fashion designers of children's clothes should be aware of the way that a child's body shape changes as it grows and they should also be able to recognize the shape of a child at a particular stage. Well designed children's clothes take account of the child's continually changing shape. Aldrich further said that the rapid growth and changing shape of the child from birth to age one means that close increments in sizing have to be made, this is done usually on three month intervals. It is at this stage that weight and the age of the child are the predominant description for garment selection, whereas height becomes the critical sizing division once a child begins to walk.

According to Conygham (2003), clothing children in suitably designed wears is a big development in many countries. In the past centuries, children's clothing usually followed the adult fashion, which makes them clumsy and ill fitting. Clothing pre-school children presents a greater challenge today than in the past generations. The kind and variety of garments available today seem almost limitless, as a result of the new technology and its accompanying mass

production of garments. Conygham continued by saying that pre-school children gradually learn to dress themselves and by the time they are four to five years old, they manage to do so quite efficiently as long as the clothing is easy to handle and has no complicated fastenings. Conygham (2003) observation from children developmental sequence table is as follows:

**Table 2.1: Children development sequence**

| 3Years | 4 Years | 5 Years |
|---|---|---|
| Greater interest and ability in undressing. May need some assistance with shirt and sweater. | Able to dress and undress himself with little assistance. | Undress and dress with care. |
| Able to unbutton all front and side buttons by pushing buttons through button hole. | Distinguishes between front and back of clothes and put them on correctly. | May be able to tie shoe laces (usually at six years) |
| In dressing, does not know front from back. | Washes and dries hands and face. | |
| Intent on lacing shoes but usually laces them incorrectly. | Brushes his teeth. | |
| Washes and dries hand. | | |
| Brushes teeth with supervision. | | |

Source: Sewing & Clothing for children Conygham (2003)

Weber (1990) viewed that children clothes should always be brought large, for example for a baby's first birthday, purchase an "18 month" or "24 month" size outfit. A two year old toddler

will probably wear a size 3T or a size 4T. Older children also grow very quickly. They grow taller much faster than they grow wider therefore; look for garments with deep hem allowances that can be extra long so that the buttons can be adjusted as the child grows.

## 2.4 Historical Development of Velcro

Velcro the hook and loop fastener was invented in 1941 by Swiss engineer known as George de Mestral who lived in Commugny, Switzerland. The idea came to him one day after returning from a hunting trip with his dog in the Alps, he took a close at the burrs, that is seeds of burdock that kept sticking to his clothes and his dog's fur, then examine them under a microscope and noted there are hundreds of hook that caught on anything with a loop, such as clothing, animal fur or hair and saw the possibility of binding two material reversibly in a simple fashion, he figured out how to duplicate the hooks and loops. Though people refused to take the idea then he took the idea to Lyon, which was then a center of weaving, where he managed to gain the help of one weaver, who made two cotton stripes that worked (http://en.wikipedia.org/wiki/file:sneakers-velcro, jpg.)

However the cotton wore quickly, so De Mestral turned to synthetic fibers where nylon was found to be the best synthetic which had several advantages. Nylon does not breakdown, rot, or attract mold, and it could be produced in threads of various thickness, when sewn under hot infrared light, nylon forms hooks that were perfect for the hook side of the fastener. De Menstral found out that nylon thread woven in loops and heat-treated, retains its shape and is resilient, however the loops have to be cut in just the right spot so that they could be fastened and unfastened many times. On the verge of giving up, a new idea came to him, which he bought a pair of shears and trimmed the top of the loops, thus creating hooks that will match up perfectly

with the loops in the pile. Mechanizing the process of weaving the hooks took eight years and it took another year to create the loom that trimmed the loops after weaving them.

It took ten years to create a mechanize process that worked. De submitted his idea for patent in Switzerland in 1951 and the patent was granted in 1955, within a few years he obtained patents and began to open shops in Germany, Switzerland, great Britain, Sweden, Italy, the nether lands, Belgium and to the textile center of Manchester, new Hampshire in the united states where columnist Sylvia porter made the first mention of the product in her column as "Zipper less zipper" has been invented finally. The new fastening device is in many ways potentially more revolutionary than was the zipper. A Montreal firm, Velek, Ltd. acquired the exclusive right to market the product in North and South America, as well as Japan.

De Mestral (1948) obtained patents in many countries right after inventing Velcro as he expected a high demand immediately. Velcro's integration into the textile industry took time, it looked like it had been made from leftover bits of cheap fabric and thus was not sewn into clothing or used widely when it debuted in the early 1960s, and it was also viewed as impractical until Velcro got its first break when it was used in the aerospace industry to help astronauts maneuver in and out of bulky space suits. The next major use of Velcro was with the skiers, who saw the similarities between their costumes and the astronauts thus saw the advantages of a suit that's easier to done and remove scuba and marine gear followed soon after seeing astronauts storing food pouches on walls and stand upright in the weightless atmosphere with the aid of Velcro, children's clothing makers came onboard. Later improvements included strengthening the filament by adding polyester.

In 1978 De Menstral's patent expired, prompting the flood of low-cost imitations from Taiwan, China and South Korea onto the market. Today, the trade mark is the subject of more than 300 trade mark registrations in over 159 countries. George de Mestral was included into the national inventors' hall of fame for his invention (Wikipedia 2011). According to Microsoft Encarta, (2009), Swiss engineer George de Mestral invented Velcro in 1948 after becoming curious about how burs (prickly seed husks) clung to his clothes and his dog's fur during hunting expeditions. De Menstral examined a bur under microscope and observed that its surface had hundreds of tiny hooks that could attach to threads like projection on cloth, fur and other soft substances.

De menstral duplicated the bur principle to create a hook and loop fastener for garments and received a patent for his invention in 1955. The name for the fastener, coined by De Menstral has roots in two French words: Vel comes from velour, meaning "Velvet" and Cro from Crochet, meaning "hooks". Although Velcro's two strips can easily be pulled apart by peeling back one strip, they resist being pulled apart sideways or straight up and down. This feature makes Velcro an ideal fastener with many uses. It is light weight and durable, maintaining its function even after thousands of fastenings and unfastening. A Velcro connection also stays strong when wet. The strength of a Velcro connection increases dramatically with the area of the contact. Entertainers who hurl themselves at walls of Velcro have demonstrated that the materials are strong enough to hold up human bodies. The use of Velcro became widespread from the late 1960s. Today, it attaches strap flaps and layers in shoes, garments, sporting goods, spacesuits and other products where ever items require quick convenient and strong fasteners.

## 2.5 Clothing and Self Dress

Learning to get dressed takes patience, time and lots of practice for pre-school child, it take longer time to master these skills in small child than average-size children did, but they can learn to do it all by starting slowly, one clothing item at a time hence nothing breads success like success. It is easier to start a young child on undressing rather than dressing, often both parents are working, making mornings too hectic for initial experiences with dressing. It has been suggested that having the child undress from his or her pajamas in the morning and daytime clothes in the evening is a good place to start. On weekends, more learning can take place and in time, the child will become more experienced with both dressing and undressing, even if only one piece of clothing is successfully accomplished, it's a great start. Gagne (2011) continued by saying the alterations are must for any child because right-sized clothing makes dressing easiest, hopefully sewing enough to do alterations on trouser lengths, hems, shirts, coats, etc. these alterations plus loops on underwear, rings, on zippers and "lightened" elastic on pull, on pants and skirts are often all that is necessary.

Weber (1990) observed that Toddlers take great pride in learning to dress themselves, garments with large neck and armhole openings are the easiest for them to manipulate. Pants with elastic waistlines are easier to pull up and down for toilet training than pants with shoulder straps. Large buttons, snaps and zippers with oversize pull tabs are good choices. Hooks and eyes, laces and tiny buttons are usually too complicated for the toddler and pre-scholars to manage .Gagne (2011) viewed that a dressing stick researcher is a child's best friend when it comes to self-care; it is a dowel with a ant hook on one end and a bent double coat hook at the other end, that has 1001 uses: such as removing socks and shoes, pushing down underwear and trousers for undressing or self-toileting, adjusting the back of collars, as well as being a general

researcher for faucets, elevators buttons etc. the plant hook end is used mostly on underwear and pants loops, zipper rings and shoes rings. Gagne explained that usually children start out their dressing sitting down on a low stool, especially to get underwear and trousers on.

The pants (or under wears) are tossed on the floor front – side up, the child uses the plant hook end of the dressing stick on the loops to get the pants over the feet and to about knee level. Once at knee level, the child stands up and gets the underwear the rest of the way up using the up and out motions either by hand or with the researcher using mirror. This allows the child to direct his or her dressing stick to any clothing loops that might usually be out of sight, even those on shoe straps. Gagne (2011) also said that another innovative idea for a dressing stick which can be made out of thin wood or a paint stirring stick, this researcher can be used for dressing, as well as being handy for light switches and for the elevator buttons.

The edges should be rounded off to avoid scratches to the skin. To make a fold or a man's jacket, cut the researcher in half and add a small hinge also add a small hook near this spot to keep the researcher from folding while in use. Horn (1975) said that young children begin to learn the differences in sex roles very early so that even by the age of two or three years distinctions in attitudes and interests may be noted, much greater conformity in dress usually demanded and stronger social sanctions are enforced against males who wear feminine attire. Patterns in child rearing reveal that parents strongly influence such sex role ambiguity. Little girls today are often dressed for play in overall or shorts and a certain amount of tomboy behavior are regarded with - amusement on the part of the parent. Little boys however, have no corresponding freedom and any tendency toward feminine behavior is given immediate disapproval.

Pitcher noted in Horn (1975) that fathers especially tend to emphasize a kind of exclusive masculinity in their sons. Pitcher continued by saying that cultural definition of appropriate sex role behavior tends to be more ambiguous for female than it is for males on the surface, this kind of role flexibility might seem to give women the advantage, but studies have shown that our culture gives greater priority to masculine qualities and female are quick to perceive this. Children therefore learn their sex role through nature of dressing they grow to see their parent dressing for them as such when it comes to their own self dressing they follow the same pattern of dressing. Weber (1990) said that it is important that a child's cloth be easy to put on and take off, because babies and toddlers diapers and clothing are changed several times a day, as such pants should have gripper snaps on the inside leg seam so that diapers can be changed easily. One piece garment that fall from the shoulders, and shirts and sweaters that button up the front or on the shoulders all make it easier to dress the child.

Using hooks and loop fasteners instead of buttons and button hole makes it easier for young children such as pre-scholars' to dress themselves. If desired, decorative buttons can be sewn on the outside of the garments, on top of the fasteners. Mohammed and Umar (2010) observed that the family structure as it relates to clothing needs of young children, a couple with small children will need baby clothing more often as children grow quickly and always outgrow their clothing before they are worn out. Hence children's clothing should always be bought largely enough to allow for future growth. Young children grow taller much faster than they grow wider very fast. Therefore, look for garments with deep hem allowance that can be lengthened easily in the future.

## 2.6 Importance of Velcro as a Fastener

The importance of Velcro on clothing can be seen through its qualities and numerous functions such as; Velcro is strong enough that a two inch square piece is enough to support 175 pounds (75kg) person. The strength of the bond depends on how well the hooks are embedded in the loops, how much surface area is in contact with the hooks and the nature of the force pulling it apart. If Velcro is used to bind two rigid surface for example auto body panels and frames, the bond is particularly strong because any force pulling the pieces apart is spread evenly across all hooks. Also any force pushing the pieces together is disproportionally applied to engaging more hooks and loops ( http://en.wikipedia.org/w/index.php)

Vibration can cause rigid pieces to improve their bond. Full – body Velcro suit have been made so that they can hold a person to a suitably covered wall. When one or both of the pieces is flexible, for example a pocket flap, the pieces can be pulled apart with a peeling action that applies the force to relatively few hooks at a time. If a flexible piece is pulled in a direction parallel to the plane of the Velcro surface, then the force is spread evenly as it is with rigid pieces. Three ways to maximize the strength of a bond between the two flexible pieces according to http://en.wikipedia.org/w/index.php are to:

I. Increase the area of the bond, for example using larger pieces of Velcro.
II. Ensure that the force is applied parallel to the plane of the fattener surface, e. g. bonding around a corner or a pulley.
III. Increase the number of hooks and loops per area unit.

Shoe closures can resist a large force with only a small amount of Velcro, this is because the straps are wrapped through a slot, having the force on the bond by acting as a pulley system

thus gaining a mechanical advantage and further absorbing some of the forces in friction around the tight band. This layout also ensures that the force is parallel to the Velcro strips (Wikipedia, the free encyclopedia 2011). Velcro is easy to use, safe and maintenance free and there is only a minimal decline in effectiveness even after many fastenings and unfastening. The tearing noise it makes can also be useful against pick pockets. Additionally, in the United States Fir force, where Velcro is used to attach patches to flight suits, aircrews have learned that they can remove small cloth pile balls that accumulate on the suits by using the hook side on the back of the patches like a brush to remove them. Despite its numerous advantages, Velcro still has several deficiencies such as: it tends to accumulate hair, dust and fur in its hooks after a few months of regular use. The loops can become elongated or broken after extended use,

Velcro often becomes attached to articles of clothing especially loosely woven items like sweaters. The clothing may be damaged when one attempt to remove the Velcro even if they are separated slowly (Wikipedia, the Free Encyclopedia, 2011). It continued by saying that the tearing noise made by unfastening Velcro makes it inappropriate for some applications, for example a soldier hiding from his enemy would not want to alert the enemy to his or her position by opening a Velcro pocket. It also absorbs moisture and perspiration when worn next to the skin and it smells if not washed. Textiles can contain chemicals or compounds for example dyes that may be allergic to sensitive populations. Velcro products have been tested according to the Oeko-tex Certification Standard which imposes limits on the chemical content of textiles to address the issue of human ecological safety.

Application of Velcro increases due to the fact that it is easy to use, maintenance free and safe, the hook and loop fasteners have been used for just about every conceivable application where a temporary bond is required. It’s especially popular in clothing where it replaces buttons

or zippers and as a shoe fastener for children who have not yet learned to tie shoelaces and for those who choose Velcro over laces ( http://en.wikipedia.org/w/index.php?title = Velcro). Velcro is used in adaptive clothing, which is clothing designed for people with physical disabilities, the elderly and the infant who may experience difficulty in dressing themselves due to an inability to manipulate closures, such as buttons and zippers, as Velcro is easier to manipulate, it makes a good replacement.

Velcro held together a human heart during the first artificial heart surgery and it is used in nuclear power plant and army tanks to hold flashlights to walls, cars use it to bond headliners, floor mats and speaker covers. It is used in the home when pleating draperies, holding carpets in places and attaching upholstery, among many other things. It closes backpacks, briefcases and notebooks, secures pockets and holds disposable diapers on babies. It is an integral part of the game tag rugby; it is used in surfboard leashes and orthopedic braces. NASA makes significant use of Velcro each shuttle has ten thousand inches of a special Velcro made of Teflon loops, polyester hooks, and glass backing.

Velcro is used everywhere, from the astronauts suits, to anchoring equipment. In the near weightless condition in orbit, Velcro is used to temporarily hold objects and keep them from floating away ( http://en.wikipedia.org/w/index.php?title = Velcro). A Velcro patch is used inside astronaut's helmets where it senses as a nose scratcher, during mean times astronauts use trays that attach to their thighs using spring and Velcro fasteners. The U. S. army is another big user of Velcro: it uses Velcro fasteners on combat uniforms to attach name tape, rank insignia, and shoulder pockets for unit's patches, skill tabs and recognition devices such as on fared (R) Feedback American flag. They also had silent version of Velcro developed for use with army soldier uniforms, as ripping sound could betray a soldier's position.

A new version was created which reduced the noise by over 95%. The manufacturing process to produce this noiseless Velcro is however a military secrete. There have been some other failed uses of Velcro as well ; one of such failure was a worn collar that contain a cylindrical strips that fishers were supposed to slip over their live bait, the Velcro was supposed to snag in the teeth of striking bass. Another failure was a strap-on device for impotent men ((http://en.wikipedia.org/wiki/file:sneakers-velcro, jpg.). Velcro jumping is a game where people wearing Velcro – covered suits take a running jump and hulk themselves as high as possible at a Velcro – covered wall. The wall is inflated and looks similar to other inflatable structures. It is not necessary completely covered in Velcro, often there will be vertical strips of Velcro sometimes, instead of a running jump, and people use a small trampoline.

Television showed and hosted by David letterman during the February 28, 1984 episode on NBC (National Broadcasting Commission). Letterman proved that with enough Velcro a man could be hurled against a wall and stick by performing this feat during the television broadcast. This put Velcro in the national spotlight. Velcro jumping goes beyond David letterman, though Amusement Companies rent Velcro walls and jumps suits for $400 - $500 a day. It was also done on a regular basis in pubs in both New York and New Zealand, where it is a competition to see how high a person can get their feet above the ground. Jeremy Bayliss and Graeme Smith of the on Bar and Grill in Napier, New Zealand started it after seeing American astronauts Velcro to walls during space flights and created their own equipment for the "human fly" contests, and sold it to several others in New Zealand. The game moved to the U. S. after sports illustrated and published a story on it in 1991 ( http://en.wikipedia.org/w/index.php?title = Velcro).

According to( http://en.wikipedia.org/w/index.php?title = Velcro). Adam powers and Stephen Was tell of the perfect Tommy's bar in New York City read of the game and soon became the

United States distributor of Human Bar fly equipment Velcro wall jumping now exists of New Zealand bars and is said to be one of the favorite bar activities there. Lenard Duffy sees noting to be the disadvantages of Velcro and taking Velcro as his model and created a new product called the "the sliding engaging fastener" instead of loops and hooks which has interlocking islands with undercoated edges that slide together. Duffy then created a wraparound cast made from a single plastic sheet sealed with his fasteners to replace similar removable casts with Velcro straps. His sister – in – law had a removable casts with Velcro strips and complained about the Velcro because it absorbed perspiration and thus smelled as well as catching on her clothing with the unity wrap. Duffy won the grand prize in NASA's "create the future" invention contest since then the sliding engaging fastener has become available at material conneXion a global materials consultancy library of innovative and sustainable material and make several designers and a prosthetics company have expressed interest.

The advantages of this new Velcro are that it is more durable that is it does not wear down over time, it is eight time stronger, and makes noise when fastened or unfastened. However it is thicker and bulkier, which limits some of its applications and it is also not as flexible as Velcro. Velcro has worked its way into popular culture and common knowledge, as such it has been part of many movies and mentioned in songs and television shows. In 2001 a space odyssey flight attendants on commercial space craft wear Velcro soled slippers to keep themselves attached to the dock; on star Trek Velcro was used to attach phases and communicators to the uniform belts or trousers, although it was never named as such. The early 90s sitcom parker Lewis can't lose featured a character – Jerry Steiner – with a seemly bottomless jacket filled with tools and supplies all of which were removed with the familiar Velcro tearing sound. In the 1996 John

Frankenheimer film the island of Dr. Morean's assistant jokingly claims that the doctor won his Nobel Prize for inventing Velcro.

Velcro has become part of a recurring joke in various media in which nit is claimed that modern human would be unable to invent it and that it is infarct a form of advanced technology. For example, K claims in Men in Black that Velcro was originally alien technology and a 2002 star trek enterprise episode features. Velcro as being given to modern society by Vulcan's in 1957 as a tongue in check reference, one of the Vulcan's in the episode was named Mestral after Velcro actual investor. More recently one of characters in the 2004 film garden state made a vast fortune from investing silent Velcro. Sacha Baron Cohen's character Bruno wears a Velcro suit in the movie of the same name. Velcro has entered popular culture is also an evidenced by its use as a verb as in "he Velcro his shoes" meaning to fastened the shoes with Velcro.

## 2.7 Characteristics of a Pre-school Child

I. There are many characteristics of pre-school such as most young children are interested in themselves and their environment. They are curious and like to explore, investigate and be creative. They have a sense of wonder and amazement; like to establish good relationships with adults and peers, and enjoy communicating with them. They are developing self-esteem and self control. They often work in groups and some may show signs of leadership; sometimes they like to play alone; are developing concentration and a range of skills and competences. They are learning to reason and solve problems and with the support and guidance of adults, can further enhance their own learning; enjoy stories, rhymes and music; enjoy physical play and are becoming physically independent.(http://www.google.com.ng/search)

It continued that Characteristics of pre-school children include the following: Physically, Mentally, Socially, Emotionally and Spiritually.

2 **Physically** Able to button, zip, buckle; Cuts simple shapes with scissors, Puts on shoes, Climbs easily, Moves about quickly, Able to copy simple figures, Can roll a ball to hit an object, Has a high need for motor activity, May alternate handedness

3 **Mentally** Often not able to distinguish between fantasy and reality, able to follow two or three step directions, can retell stories, can recognize cause and effect, recognizes letters of the alphabet and numerals, often reverses letters and numerals when writing. Has beginning sense of time (clock and calendar), is likely learning to write own first name, likes repetition, often asks "why, "exaggerates in story telling, likes new and big words

4 **Socially** Likes to whisper and tell secrets, May demonstrate healthy self-confidence, May tests limits continually, Values friendships, Plays more interactively; less parallel play

5 **Emotionally** Very responsive to happiness and laughter, May experience intense feelings, May be very sensitive to correction, May take on the emotions of the adults around them, May have genuine questions about life, death, heaven, hell

6 **Spiritually** Can learn basic information about God

7 created the world; He loves and cares for me and all people; He forgives us when we are sorry for doing wrong.(http://www.google.com.ng/search)

According to Hughes (1999), three general characteristics—corresponding to trends in the areas of intellectual, social, and personality development—capture the essence of the period of middle childhood. From an intellectual standpoint, the major development is that the child's thinking is becoming more orderly, more structured, and more logical. Therefore, the school-age child at play will be more realistic and more rule-oriented than was the preschooler. Play will thus reflect

a developing need for order. The school-age child is more socially involved with age-mates than ever before, and the peer group provides support that formerly was offered only within the family. Acceptance by one's peers is of great importance to children in this age group, and their play reflects a sometimes overwhelming need to belong. Finally, in the realm of personality development a major challenge to the emerging self-concepts of school-age children is to demonstrate to themselves and others that they are competent, that they have talents, skills, and abilities that they can be proud of. In their play, there is reflected this need for industry.

### 2.8.1 Factors to be Considered when Producing Clothing for Pre-School Children

Factors to be considered when producing clothing for pre-school children will be reviewed under the sub-topics: the growth of pre-school children and development, allowance for growth, self help and easy of dressing.

#### The Growth of Pre-school Children and Development

The growth of pre-school children and development is one of the factors that affect the production of pre-school clothing due to continuous growth in them. Aldrich, (2006) stated that designers of children's cloths should be aware of the way that a child's body shape changes as it grows and they should also be able to recognize the shape of a child at a particular stage. Well designed children's clothes takes account of the child continually changing shape. The rapid growth and changing shape of the child from birth to age one means that close increments in sizing have to be made; this is done usually in three month intervals. It is at this stage that weight and the age of the child are the predominant descriptions for garment selection, whereas height becomes the critical sizing division once a child begins to walk. Aldrich (2006) continued by

saying that the speed at which a child grows decreases steadily from birth onwards until puberty when the rate of growth accelerates that is growth spurt.

Aldrich (ibid) also noted that there is a little difference between boys and girls in the speed at which they grow. The decrease in the rate of growth varies from approximately 8centimeter per year at three years to 5centimeter per year at ten years. Manufacturers have decided to accept 6centimeter interval as a base for a coding scheme, as this period. However, it must be noted that the range of heights in children in any particular age group is larger than the amount of growth that occurs in any one year; therefore a child's age is only a very crude guide or designation of the expected stature. It is better to link other body measurements to height rather than age, and one must recognize that age on clothing labels is only a secondary description. During puberty age ceases to have even a descriptive value as variations in height linked to hereditary are further distorted by the variability of the onset of puberty and the growth spurt.

In early childhood there is little differences between the sexes, hence significant difference begin to appear at about seven which means that by this age it is necessary to offer a size chart for each sex. Puberty brings dramatic differences between eighteen months to two years earlier in the girl. Children of the same height can have variable arm and leg measurements and these differences become more apparent as the limb length increases. The most apparent characteristic of a small child's shape is the size of its head: by the age of three the child's head has almost completed its growth. A small child has a head one fifth of its height while the adult's head is only one eight. The head size of a child must be taken into account when designing openings on the bodice for the head to pass through from the age of two, the average child loses fat until about the age of eight. This sliming down process is very apparent and it is general spoken of in terms of the child losing his baby fat; Boys are often a little thinner than girls at this stage, but as the differences in

measurements are small, a common size chart can be used. The most significant difference occurs on the hip / seat measurement and some manufacturers of boys wear take account of this. Toddlers have very little waist shaping and their stance gives them a hollow back and protruding stomach. These features decrease as the child grows and loss fat.

Children of 3 and 5 years old are commonly referred to as pre-schools. Karen, (1996) physical growth during the pre-school years is slow and gradual. The head growth is slow, limb is rapid and trunk is intermediate. By the time the child reaches his sixth birthday, his body proportions are much like those of an adult. Table 2.2 below shows the average heights and weights of children at different pre-school ages.

**Table 2.2: Average heights and weights of preschoolers**

| **Age (in years)** | **Height (in cm)** | **Weight (in kg)** |
|---|---|---|
| Three | 96.5 | 14.5 |
| Four | 1004 | 16 |
| Five | 112 | 18-6 |
| Six | 112 | 20 |

Source: The Child Care Professional (Karen 1996).

Karen (1996) further explained that by their fourth year, pre-scholars show obvious physical difference from toddlers. As pre-school children grow, their bodies appear less bay like. Body fat is reduced and most growth occurs in the muscles and bones. Posture becomes erect, the neck lengthens, the shoulders widen and flatten and the once protruding stomach flattens, while the legs become proportionally longer.

Gillan (1973) reported that 90% of pre-school children's clothes made of cotton, while 10% are made of synthetic fibers. It is possible that of the newer fibers will be used for pre-school children as their resistance to high washing temperatures and their absorbent qualities improve. Mildfred and Oris (1979) stated that clothing for the pre-school child is a problem for many families. Not only is clothing for the small child expensive for the short length of time to be worn, but it is often unsuited to the use to which it is put. As the pre-school child matures and becomes better able care for himself, he enters into widening social relations, which make him singly clothes-conscious. His need to jump, climb, run, carry, and push ease and skill, in addition to this awakening social consciousness, demands clothes be flexible and not binding., warm but not hot, absorbent and easily, soft and yet durable, easy to put on and take off, conducive to self-help independence, attractive in design and material, adaptable to frequent toileting, and adjustable to a rapidly growing body. This is no small order, and it little wonder that mothers find it difficult to find clothing which meets all needs.

According to Mildred and Oris (1979), the wardrobe of the pre-school must be chosen with as much care as that of any family member. There is no one is suitable for all preschool children; however, pre-school clothing has certain general characteristics, irrespective of where the child lives. Lure (I982) was of the opinion that all fabrics used for pre-school children's clothes should be preshrunk. If they are not, a garment may shrink the equipment of two sizes in the first washing and thus become unwearable. In addition, fabrics should be fast. Constant washing will cause the best of dyes to fade before a garment outlived its usefulness. Suitable fabrics for pre-school children's clothing should wash and iron easily; preferably they should require no ironing Goode (1982) stated that many factors affected the size and content of a child pre-school child wardrobe. Cold climate requires more clothing than warm one. Social status of the parents will

determine the quality as well as quantity of pre-school child's clothing, as well as the number of occasions for which the child is required to dress up. In addition to being constantly active, the pre-school child needs clothes that protect the body from scratchy bushes, hard sidewalks, and numerous other skin bruisers. Overalls or coveralls and longed jackets are especially designed to give such protection.

Weber (1990) explained that the amount of money available will determine to some extent the amount and quality of clothing to be purchased. Clothing re-school children is a great financial burden for lower-income families because of the limited price range in children's garments. In addition, turn-price, inexpensive clothes, especially dresses are often over trimmed poor design. Weber (1990) agreed with Okeke (1990) that cotton is by far the most important fiber for preschool children's garments. It is considered to be hygienic, easy to launder, absorbent, and comfortable. Special finishes providing crease-resistance, water repellency, and non-inflammability have, increased the desirability of cotton fabrics.

Buck et al (1996) highlighted some of the factors in selecting pre-school children clothing to include:

a. Garments must fit the body of the child closely and be free of devices that may catch on abutments. Loose clothing, too long parts, legs or sleeves, may get caught in the wheels of tricycles, get stepped on when climbing, or catch on sticks, causing the child to fall down or be thrown. Neckline of shirts, blouses *and* dresses should be low in front to prevent choking.
b. Garments should be light in weight with maximum warmth and protection. Heavy or cumbersome garments tend to tire the child and thus restrict his activity.

Bright colours are desirable for pre-school children's outer garments because they make it easier to spot the child on the playground, in the yard, or on the street. Colour, design, and texture of the fabrics used should be suitable for the age and size of the child. Soft and easily-cared for fabrics are most appropriate for children's clothes. A good-quality fabric with a firm, close weave, made of firmly twisted yarns that will not wrinkle or soil easily, is preferable for most outer garments. Clothes worn next to the body, especially underclothes should be of loosely woven or knit fabric to provide proper body ventilation and absorb moisture.

**Allowances for Growth**

Allowance for growth is another thing to consider in garment production for pre-school child because of their rapid increase in size and weight. Mildred and Oris, (1979) highlighted that growth is most rapid during the preschool years. One of the greatest needs for this age is for longer wearing apparel that maintains both good fit and appearance through its life. Buying garments with too large width with the idea that the child will grow into them, is false economy. This practice is psychologically bad for the child in that it affects both his physical comfort and personal appearance. Some thought is now being given to designing children's clothing that will "grow" as the child grows. Marshall et al (2004), stated that the following features should be looked for when selecting garment for the pre-school child:

I. To provide for growth in height:

i. Skirts and dresses with deep hems of tucks at bottom. Trousers with a wide cuff.

ii. Dresses and trousers with tucks at the waistline to lengthen the upper part of the dress.

iii. Skirts and trousers that button on to waist. Buttons can be lowered on the waist to increase length.

iv. Yokes with crosswise tucks that can be released as trunk of body lengthens.

II. To provide for growth in width or girth:

i. Raglan or kimono sleeve rather than set-in sleeves.

ii. Tucks, pleats, or gathers at the shoulders line.

iii. Large underarm or leg seams to let out as needed.

Seams should be soft to prevent irritation. In addition, seam should be well finished, or they will soon pull out and ravel with constant wear and washing. Fasteners should be as flat as possible. There should be no sharp or pointed edges on fasteners to cut, scratch, or gouge the child. Hems of dresses should be firmly stitched.

**Self-Help and Ease of Dressing**

According to Weber, (1990) ease of dressing concerns dressing comfort. This is the amount of fullness needed in pre-school children clothing for movement and comfort. A self-help garment is one which the child can put on take off with little or no help from an adult. In agreement with the above statement, Das and Ishtiaque, (2004) discussed that the experience of learning to dress himself makes the pre-school child more independent and saves conflict. It helps him to develop judgment and saves time for the busy homemaker. Das and Ishtiaque (2004) points to remember in selecting what will encourage independence in dressing are:

a. Long openings, located for reach. Front openings are easier to handle than back or side openings.
b. Simple styles are easier to manipulate than complicated ones.
c. Large buttons or fasteners are easier to manage than small ones.

d. One-piece garments are easier to put on than two-small ones.

e. Collarless dresses; blouses, and shirts are easier to handle than those with collars.

f. Avoid separate belts as these get twisted and caught in dressing.

### 2.7 Empirical Studies

Anya (1991) conducted a study on developing patterns for children's garment. The age involved were pre-school children to school age children. The study aimed at highlighting new ideas and innovations to improve on children's classic block used in developing style patterns for garments that will impress both parents and children's. Four blocks were drafted in four different children's size range. The most prominent areas treated in the work patterns for garment that would satisfy children in their physical and psychological development stages is that the patterns developed were based on children's physical and psychological needs. It was discovered from her study that with the current cost of children's wear some mothers were not able to afford them. The mothers were therefore advised to develop interest in adapting patterns for their children's wear. Based on the past study, it is expected that as mothers acquire some skills on developing patterns for children's wear, they will be able to produce for themselves patterns for children's wear.

Anya's research represented one of the ideas in developing style for pre-school children that will impress both parents and children in the present study. The researcher developed styled garments to satisfy children in their physical and psychological developmental stages. The recommendations made were useful for the present study in some of the features to check for when selecting garments for the pre-school child. The present study constructed garment for pre-school children using Velcro fastener and conducted in FCT Abuja, different from Anya's location. The gap filled by this present study is the actual practical construction; hence Anya's

research was on patterns only, while the present study was from patterns to garment production with Velcro.

Gautum (2005) conducted a study on concept of general consideration of clothing for pre-school children (2-4 years) among rural mothers in Palmpur. The investigation on concept of general consideration of clothing for pre-school children ranging from the age of 2-4 years was carried out among rural mothers in Palmpur Tehsil of Kangra district of Himachal Pradesh. A random sampling method was used for the selection of respondents that comprised of mothers pre-school children age between 2-4 years. Ten villages were chosen from the list of villages. From each village, 10 respondents were selected randomly making a sample size of 100. Pre-structured closed ended questions for interview were prepared. Respondents were personally interviewed to collect the authentic primary data. The data were tabulated by using frequency and simple percentages.

The study revealed that 72 percent of the respondents preferred long opening while 20 percent preferred one piece garment. As regards safety features most of the respondents were found to be little aware about it. Only 20 percent of the mothers considered texture of the fabric as a comfort feature. It was concluded that rural mothers were not much aware of general consideration of clothing for the pre-school children considered important for health, growth, adjustment, safety and for the development of the child.

The present study is similar to Gautama's study in the area of pre-school clothing and differs on age of 2-4 compare with 3-5 years. The present study was carried out in FCT Abuja; practical construction of pre-school garment using Velcro was made. The gap filled the construction of garment with suitable fastener for pre-school convenient, independent and self dressing.

Ampong and Gavor (2006) conducted a study to assess the construction quality of garments produced by Ghanaian tailors and seamstresses. The researchers drew their samples from two hundred and four (204) garment manufacturers. Ghana National Tailors and Dressmakers Association with a total population of one hundred and sixty eight (168) and Ghana Association of Fashion Designers and Exporters with a total population of thirty-six (36). Purposive sampling was used to select 42 manufacturers. The instrument used for collecting data was observation and assessment form. Percentage was used to analyze the data collected. Three quality control experts in a clothing manufacturing industry assessed the quality of construction processes in the sampled garments. Rating by the assessors for the construction processes presented in the sampled garments indicated that (46.9%) of the ratings of the construction processes had values above the average. The rating also showed that the manufacturers were most competent in structural trim, finishing and interfacing and less competent in pocket, and hem. Specific construction defects identified included variable stitch per inch, uneven seam allowance, and unbalanced collar on neckline, absence of under-stitching of facing and uneven width of top stitched parts.

The study was delimited to garment produced by Ghanaian tailors and seamstresses only. The population used for data analysis was two hundred and four (204) garments manufacturers and the statistical instruments used were the simple percentages. The present study is similar to the previous study in the areas of construction of garment and differs in the level of study which is on pre-school clothing using Velcro as a means of fastener and the location is in FCT Abuja. The gaps filled are accessibility of garments construction for pre-school children in addition to Ampong and Gavor assessment of quality in garment construction.

Chukwudumebi (2009) conducted a study on comparative analysis of foreign and Nigerian made children garment: implications for consumers. The age involved were pre-school children of 3 – 5 years. The location of the study was Ahmadu Bello University Teaching Hospital (ABUTH) Zaria and St Luke's Anglican Hospital (Maternity Section) and Sabon – Gari market Zaria in Kaduna state. Descriptive survey research design was used to collect information from sampled population. The population for the study comprised of all mothers of pre-school children attending maternity clinic in Ahmadu Bello University Teaching Hospital (ABUTH) Zaria that was 2226 and 600 from St. Luke's Anglican Hospital in Zaria giving a total population of two thousand eight hundred and twenty six (2826) as the target population. Purposive sampling method was adopted for the study; three hundred and eleven (311) respondents were selected comprising two hundred and forty four (244) from ABUTH Zaria and sixty seven (67) from St Luke's. The instruments used for collecting data were structured questionnaire and non-participant observation. Four null research hypotheses were formulated. The two tailed t-test was used to test Null hypotheses at 0.05% level of significance. All the null hypotheses were rejected. The result indicated that the foreign made pre-school children's garments were discovered to be better in terms of stitching quality, accessories hem finishing, trimming and fastening than the Nigerian made pre-school children's garments.

The present study is similar to the previous study with the level of the research that is pre-school children. They are different in the following ways: the present study was carried out among pre-school children in FCT Abuja, constructions of pre-school children's garment made using Velcro fastener in all the openings. The population used was 60 instead of 311 samples, hence experimental and three null hypotheses were formulated. The gap filled was the

construction of pre-school garment and the easy accessibility of the opening with convenient fastener.

## 2.10 Summary of Reviewed Literature

The Literature reviewed what different authors have written on pre-school children's clothing. Literature was reviewed on the concept of Velcro, concept of pre-school children's clothing, History of Velcro, clothing and self dressing, importance of Velcro as a clothing fastener, factors to consider when selecting clothes for pre-school children and empirical studies on children clothing.

Literature reviewed above revealed the definition and meaning of Velcro as suitable fastener on pre-school children garment in order to make dressing and undressing easy for the pre-school children's self dressing. It is easy to use and very suitable for making disable person's clothes, actors and children clothes. Literature reviewed also revealed other fasteners that have been used on pre-school clothing as well as the importance of Velcro and children's clothing. The literature also showed a lot of factors to be considered in the production of clothing for the pre-school children including their developmental stages which is one of the important factors in the children clothing.

It was also revealed that rapid growth in pre-school children has contributed to some of the funny clothes worn by pre-school children, especially in large families that tried to keep cost of clothing expenditure at minimum stage. It revealed that using hooks and loop fasteners instead of buttons and button hole makes" it easier for young children such as pre-scholar's to dress them. It revealed that right fabric makes the designer work easier and more rewarding for it is from fabric that the designer can select and develop style. A child at the early stage is not aware of the

design of his clothing as school children's wear are made attractive. Pre-school children gradually learn to dress themselves and by the time they are four to five years old, they manage to do so quite efficiently as long as the clothing is easy to handle and has no complicated fastening.

It has also been reviewed that Toddlers took great pride in learning to dress themselves, garments with large neck and armhole openings were the easiest for them to manipulate. Pants with elastic waistlines were easier to pull up and down for toilet training than pants with shoulder straps. Large buttons, snaps and zippers with oversize pull tabs are good choices. Hooks and eyes, lace and tiny buttons are usually too complicated for the toddlers and pre-scholars to manage alone.

Using hooks and loop fasteners instead of buttons and button hole makes it easier for young children such as pre-scholars to dress themselves. If desired, decorative buttons can be sewn on the outside of the garments, on top of the fasteners.

The gap noticed from previous researched that needed to be closed is lack of practical experiment on the use of Velcro that is hooks and loop fastener in the production of pre-school clothing which the on going research is working on presently.

# CHAPTER THREE

## RESEARCH DESIGN AND METHODOLOGY

This chapter dealt with the research design and the methodology used in this research work under the following sub-headings.

3.1 Research Design

3.2 Population for the Study

3.3 Sample Size and Sampling Procedure

3.4 Instruments for Data Collection

3.4.1 Validation of the Instrument

3.4.2 Pilot Study

3.4.3 Reliability of the Instrument

3.5 Procedure for Data Collection

3.6 Procedure for Data Analysis

### 3.1 Research Design

The research design used for this study was the pre-test and post-test of experimental and control group design with randomization. The design according to Olayiwola, (2007) allows randomization of treatments and also provides some degree of control for possible extraneous or confounding variables that might affect either the internal or external validity (or both).

This type of research allows the generalization of statistical results of the data obtained from an unbiased sample to the target population from which the sample is drawn (Ndagi, 1999). In this study the researcher investigated the use of Velcro fastener in the production of clothing for pre-school children as experimental treatment administered in order to measure the effect upon the control design sample. The experimental design dealt with the controlled conditions designed to discover relationships to confirm or disprove the truth in the null hypotheses. This was asserted by Nwargu (1990) that experimental design is a process that provides a systematic and logical procedure of identifying and evaluating the relationship between variables that create a particular state of affair under controlled conditions. Experimental design usually involves two groups of subjects, an experimental and control groups. For the purpose of this study, two groups were randomly assigned, one control and the other experimental groups. Pre-test them before the experimental conditions application to ensure that the researcher gathered pre-experiment information regarding the status of the groups, with regards to the dependent variable (Wiseman, 1999). The post-test experimental group result was compared with post test control group result to determine treatment effectiveness.

### 3.2 Population for the Study

The population for this study comprised five thousand and sixty six pupils (5066) made up of all public Early Child Care Centers (ECC2), that is, Nursery II pupils of 2011/2012 session in FCT Abuja. The ECC2 was considered because the researcher's defined age (3-5 yrs) of pre-school children used for this study mostly fell on the centre. Table 3.1 shows the population for the study.

**Table 3.1 Population for the study**

| S/N | Local Education Authority (LEA) | No. of Schools (centres) | School type | No of Males | No of Females | Total |
|---|---|---|---|---|---|---|
| **1** | Abaji | 16 | Mixed | 319 | 305 | 624 |
| **2** | Bwari | 36 | Mixed | 600 | 539 | 1139 |
| **3** | Gwagwalada | 15 | Mixed | 546 | 552 | 1098 |
| **4** | Kuje | 16 | Mixed | 320 | 300 | 620 |
| **5** | Kwali | 15 | Mixed | 194 | 191 | 385 |
| **6** | Municipal | 58 | Mixed | 615 | 585 | 1200 |
| | Total | 156 | Mixed | 2594 | 2472 | 5066 |

Source: Universal Basic Education Board, FCT Abuja 2011/2012.

**Table 3.1** Shows the Population of Early Child Care Centre 2 Pupils in FCT Abuja with total of 156 Schools from six Early Child Care Centres with 2,594 male Pupils, 2,472 female Pupils, making the total population of 5,066 Pupils in the Child Care Centre 2 in FCT Abuja

### 3.3 Sample Size and Sampling Procedure

Purposive sampling technique was used to select two Schools in Abaji Area Council Local Education Authority, out of all the six L.E.As for the purpose of proximity. The schools selected were Abaji East nursery and Primary School and Abaji Sabon–Gari nursery Primary school. These two schools were selected within Abaji town to enable the researcher easily conduct the experiment. From the schools a total number of sixty pupils of thirty boys and thirty girls were randomly selected as the sample and randomly assigned to both experimental and control groups, that is, thirty (30) each. This was done in order to enable the researcher manage the pupils for the experiment.

The procedure for selecting the Pupil from the population of fifty nine (59) pupils in ECC2 of Abaji East Primary School was 'hat' and 'draw' technique. The researcher wrote fifteen (15) 'YES' and fourteen 'NO' on the piece of papers. These papers were folded in scramble form and put in a container and mixed together very well before giving it to the male pupils of ECC2 class in Abaji East nursery and Primary School to pick one each. The same thing was done to the female pupils whereby fifteen 'YES' and fifteen 'NO' were written on pieces of papers. The papers were folded in scramble form and put in a container and shaken very well before the female pupils were asked to pick one each. The same method was used to select fifteen males and fifteen females from Abaji, Sabon-Gari nursery and Primary school pupils making thirty pupils from each school.

Abaji, Sabon-Gari nursery and Primary school pupils was assigned into the experimental group using the treated instruments which were uniforms sewn with Velcro in all the openings, while Abaji East nursery and Primary School pupils served as the control group using uniform sewn with button in the openings.

## 3.4 **Instrument for Data Collection**

Two instruments were used to generate relevant primary data in this study. The instruments were Pupils Uniforms with the Present Fastener – 1 (PUPF - 1) and Pupil Uniform with Velcro Fastener – 2 (PUVF - 2). The PUPF – 1 is the Present Uniform or cloth the Pupils were using at the various centres, along with Fastener on the opening, while the PUVF-2 are Pupil Uniforms with Velcro fastener on the openings were sewn by the researcher. Hence instruments are something used as a means of achieving a desired result or accomplishing a particular purpose.

### 3.4.1 Validation of the Instrument

In order to ensure the validity of the measuring instrument, two methods were used to determine the validity. Vetting of pupils uniforms with present fastener – 1 (PUPF - 1) and the constructed pupil uniforms with Velcro fastener – 2 (PUVF - 2) by the two researcher's supervisors, for their comments, correction and amendment if any. They both validate the quality, type of stitches, seam allowance, texture and colour of the fabrics as well as the measurement.

### 3.4.2 Pilot Study

After necessary corrections and amendment of the measuring instrument, a pilot study was carried out at God's Time Nursery and Primary School, Samaru, Zaria and Foundation Nursery and Primary School, Samaru, Zaria using a sample of forty pupils (20 boys and 20 girls). These samples had similar characteristics and background with the samples used for the study. The Pilot study was conducted by the researcher calling on each pupil randomly selected to undress

their uniforms and wear it, using stop watch to record the time each pupil used in both dressing and undress for pre-test. The post test was carried out the same way using uniform sewn with Velcro in all the openings.

### 3.4.3 Reliability of the Instrument

The data collected from forty (40) pupils were statistically analyzed using the t- test, independent samples statistics. The results showed that the forty (40) pupils used for the pilot study were significantly different in mean time for wearing uniform with button and wearing uniform with Velcro; this was because the calculated sig (P) value of 0.000 was less than the 0.05% level of significance at degree of freedom value of 38. The independent sample t-test showed that the mean times used were 1.1785 minutes and 2.7005 minutes (approximated to 1.18 and 3.10 minutes) for wearing uniform with Velcro and wearing uniform with button fastner respectively. The result also showed that their mean time for undressing uniform with button and undressing uniform with Velcro were significantly different, this was because the calculated sig (P) value of 0.000 is less than the 0.05% level of significance. The independent sample t-test showed that the mean times used were 1.7687 minutes and 0.2775 seconds (approximated to 2.16 minutes and 0.30 seconds) for undressing uniforms with buttons and undressing uniforms with Velcro respectively. The null hypotheses were rejected.

## 3.5 Procedure for Data Collection

A letter of introduction from the Head of Department of Vocational and Technical Education to seek permission from the Headmasters of Abaji East primary school and Sabon- Gari primary

school was taken to the schools. The researcher carried out practical with all the sampled pupils by timing them with the use of stop watch, on the wearing of their uniforms with button and undressing of the present uniforms with button and recorded the time each of the 30 pupils spent with the aid of a stopwatch as pre-test as well as control group. The researcher sews their school uniforms for the pupils both males and the females using Velcro in all the openings as the treatment on the existing pupil uniform were used as the experimental group. The researcher gave the uniforms to the experimental group of 30 pupils randomly selected to wear and undress whereby the researcher recorded the time it took each of the 30 pupils to wear and remove the Velcro Uniform for the selected schools. The 30 pupils used for collecting data for control group were not used to collect data for experimental group hence the instrument was different, that is, Uniform with Velcro were used in place of uniforms with button. This Procedure was suitable for T-Test independent Sample Statistics. The sample picture of the treated uniform used to collect data for the pilot study and was also part of the instruments for collecting data for the main work as shown on the Appendix II.

### 3.6 Procedure for Data Analysis

The bio- data variables on distribution of respondents according to their group were analyzed using simple frequencies and percentages. While the mean time for wearing and undressing uniforms with Velcro and the mean time for wearing and undressing uniforms with button were compared, using the Independent t-test statistics to test null hypothesis 1, 2, 3 because the t-test is one of the most effective methods of comparing two mean (Nworgu, 1991).These were done by computer using Statistical Package for Social Science (SPSS).The 3 Null hypotheses were tested at 0.05% level of significance.

## CHAPTEER FOUR

## DATA PRESENTATION AND ANALYSIS

The study titled "The use of Velcro fastener in production of clothing for pre-school children in federal capital Territory Abuja" comprised of sixty sampled students from two primary schools each comprising of thirty pupils timed with the use of stop watch, on the wearing of uniform sewed with button and undressing of the uniform sewed with button and recording the time each of the 30 pupils spent as pre-test, as well as, control group. While the other school was also timed with the use of stop watch on the wearing of uniform sewed with Velcro and undressing of the uniform sewed with Velcro as the experimental group. The mean time for wearing and undressing uniform with button was compared with the mean time used in wearing and undressing uniform with Velcro to achieve the pupil's mean time.

The demographic variables of the pupils considered on the study were their school (group) gender and their age.

### 4.1 Analysis of Demographic Variables of the pupils

These are shown on Tables 4.1 to 4.4

**Table 4.1 Distribution of respondents according to their school (group)**

| School (group) | Frequency | Percentage |
|---|---|---|
| **Abaji East Primary School, Abaji FCT (control group)** | 30 | 50.0 |
| **Sabon Gari Primary School, Abaji FCT (Experimental group)** | 30 | 50.0 |
| **Total** | **60** | **100.0** |

The details in table 4.1 revealed that out of the total of 60 respondents 30 of them, that is, 50.0% were sampled from Abaji East Primary school which were used as control

group, while the rest 30 children were drawn from Sabon Gari Primary school FCT and used as the experimental group.

**Table 4.2 Sex Distribution of Control group and experimental group**

| Sex | Frequency | Percentage |
|---|---|---|
| **Male** | 30 | 50.0 |
| **Female** | 30 | 50.0 |
| **Total** | **60** | **100.0** |

The details of the Table 4.2 revealed that out of the total of 60 respondents selected from ECC2 class of both control group School of Abaji East Primary School FCT, and Experimental group school, of Sabon Gari Primary school FCT, 30 of them, that is, 50.0% were males, while the rest 30 children were females.

**Table 4.3 Age of the pupils**

| Age Range in Years | Frequency | Percentage |
|---|---|---|
| **3 – 4** | 41 | 68.3 |
| **4 – 5** | 19 | 31.7 |
| **Total** | 60 | 100 |

Source: field survey, May 2012.

The age range in years indicated in Table 4.2 showed that 68.3% of the pupils were between 3 – 4 years old, while 31.7% were between 4 – 5 years old for both experimental and control group.

## 4.2 A**nswers to Research Questions**

Analyses of pupils for pre-test timed in wearing and undressing of uniform sewn with button and analyses of pupils for post-test timed on wearing and undressing of uniforms sewn with Velcro were used in answering the three research questions. The analyses were presented in Tables 4.4 – 4.7

Research Question One: To what extent are the uniforms produced using Velcro as a means of suitable fastener convenient for pre-school children self dressing?

Though the detail result of the time used by the pupils are seen in Appendix ix, results from Table 4.4 were used to answer research question one.

**Table 4.4: Extent of time used for wearing and undressing uniform produced with Velcro fastener and uniform produce with button fastener convenience for pre-school children self dressing.**

| Status | N | Mean time mins/sec | S.D | S.E |
|---|---|---|---|---|
| **Control (Abaji East Primary School FCT)** | 30 | 2.29 | 0.6955 | 0.1269 |
| **Experimental (Sabon Gari Primary School FCT)** | 30 | 0.65 | 0.4228 | 0.0771 |

Source: Field survey, May 2012.

The data in Table 4.4 revealed that there were thirty pupils in each of the groups timed with the aid of stop watch on the wearing and undressing uniforms sewn with button and Velcro. The control group timed on wearing and undressing uniform with button had mean time of 2.29mins/sec and standard deviation (S.D) of 0.69mins/sec and standard error of 0.13min/sec, while experimental group timed on wearing and undressing uniform with Velcro had mean timed of 0.65mins/sec standard deviation of 0.42mins/sec and standard error of 0.08mins/sec. Thus, the mean time for uniform sewn with Velcro clearly showed that uniforms with button took longer time of 1.64mins/sec than uniforms with Velcro which indicated that uniform with Velcro proves to be more convenient.

Research Questions Two: Compared the time used for wearing uniform constructed with Velcro fastener and the time used for wearing uniform constructed with button fastener for pre-school children's aid for punctuality to centre.

The result on Table 4.5 was used in answering the research question two.

**Table 4.5: Extent of time used for wearing uniforms with Velcro fastener and time used for wearing uniform with buttons fastener by pre-school children.**

| Status | N | Mean time mins/sec | S.D | S.E |
|---|---|---|---|---|
| **Wearing uniform with button** | 30 | 1.30 | 0.4327 | 0.0190 |
| **Wearing uniform with Velcro** | 30 | 0.45 | 0.3463 | 0.0632 |

Source: Field experimental / survey, May 2012.

The data in Table 4.5 revealed that there were thirty pupils each timed on wearing uniform with Velcro and thirty pupils on wearing timed uniform with button. The wearing of uniform with button had means time of 1.30mins/sec, standard deviation (S.D) of 0.4327 and standard error (S.E) of 0.079. thus with the mean time of 1.30mins/sec for wearing uniform with button was longer than the mean time of 0.45mins/sec for wearing uniforms with Velcro by 0.85mins which clearly showed that uniform with Velcro will meet pre-school aid than uniform with button.

Research Questions Three: Ascertain effectiveness of time used for undressing uniforms with Velcro and time used for undressing uniforms with button fastener for pre-school children independent care to meet toilet needs.

Table 4.6 was used to answer the research question three.

**Table 4.6: Extent of time used for undressing uniforms with Velcro fastener and time used for undressing uniform with button fastener**

| Status | N | Mean time mins/sec | S.D | S.E |
|---|---|---|---|---|
| **Undressing uniform button** | 30 | 0.96 | 0.4379 | 0.0799 |
| **Undressing uniform with Velcro** | 30 | 0.17 | 0.0831 | 0.0151 |

Source: Field survey, May 2012

The data in Table 4.7 revealed that the thirty pupils timed in the undressing uniforms with button fastener, had mean time of 0.96mins/sec, standard deviation (S.D)of 0.4379 and standard error (S.E) of 0.0831 on the other hand thirty pupils timed for undressing uniforms with Velcro had mean time of 0.17mins, standard deviation (S.D) 0.0831 and standard error (S.E) of 0.0151 which showed that mean time used for undressing uniforms with button was longer than the mean time used for undressing uniforms with Velcro by 0.79mins mean time difference, indicating that undressing uniforms with Velcro is more effective for pre-school children to meet independent care for toilet needs.

## 4.3 Testing of Null Hypotheses

This study raised three research questions and three null hypotheses formulated to achieve the objectives of the study and the data were statistically analyzed at 0.05% level of significance. The results interpreted using independent sample t-test statistics for the null hypotheses one, two, and three. In the test of null hypotheses where the calculated value was less than or equal to the critical value at 0.05% level of significance the null hypothesis was accepted. This implies no significant difference between the variables. On the other hand, when the calculated value is

greater than the critical value, the null hypotheses was rejected. This implies that significant difference existed between the variables.

The detail of the pupils data are seen in appendix viii. The summary of results from Table 4.8 to 4.11 was used for testing the three null hypotheses.

**Null Hypothesis 1:** there is no significant difference between the garment produced using Velcro fastener and garment produced using button fastener for pre-school children's convenient self dressing.

**Table 4.8: Independent t-test statistics on the difference in the time used for wearing and undressing of garment produced using Velcro (experimental) and those produced using button fastener (control) for preschool convenience self dressing.**

| | Status | N | Mean time(mins/sec) | S.D | S.E | Df | t calculated | t critical | p |
|---|---|---|---|---|---|---|---|---|---|
| Time used for wearing and undressing of uniform | Control (Abaji East Pri SCh, FCT) | 30 | 2.29 | 0.6955 | 0.1269 | 58 | 11.052 | 1.96 | 0.000 |
| | Experimental ( Sabon Gari Pri Sch, FCT) | 30 | 0.65 | 0.4228 | 0.0771 | | | | |

Source: Field survey, May 2012.

***Calculated t > 1.96, sig (p) < 0.05***

The results of t-calculated is greater than the 1.96 t-critical value at df 58, while the calculated p value level of 0.000 is less than the 0.05% alpha level of significance. Details of the independent t-test statistics revealed significant differences in the time used for wearing and undressing of uniform produced using Velcro (experimental) and those produced using button fastener (control) for pre-school convenience self dressing. The mean time used by control group students was 2.29mins/sec, while those of experimental group were 0.65mins/sec. Hence, the null

hypothesis which stated that there is no significant difference in the time used for wearing and undressing of garment produced for preschool children using Velcro fastener and their counterparts using button fastener for their convenience was hereby rejected.

**Null Hypothesis 2:** This null hypothesis state that there is no significant difference in the time used by pre-school children in wearing uniform with button fastener and their counterparts wearing uniform with Velcro.

Table 4.9: Independent t-test statistics on the difference in the time used by pre-school children in wearing uniform with button and their counterparts wearing uniform with Velcro

| | **Status** | **N** | **Mean time(minssec)** | **S.D** | **S.E** | **Df** | **t-calculated** | **t critical** | **P** |
|---|---|---|---|---|---|---|---|---|---|
| **Time used In wearing Uniform By Children** | Wearing uniform with button | 30 | 1.30 | 0.4327 | 0.0790 | 58 | 8.370 | 1.96 | 0.00 |
| | Wearing uniform with Velcro | 30 | 0.45 | 0.3463 | 0.0632 | | | | |

*Calculated t > 1.96, sig (p) < 0.05*

Details of the independent t-test statistics revealed significant differences in the time used by pre-school children in wearing uniforms with button and their counterparts wearing uniforms with Velcro. Reason being that outcome of t-calculated value of 8.370 is greater than the 1.96 t-critical values at df 58, while the calculated p value level of 0.000 is less than the 0.05% alpha level of significance. The mean time used by children in wearing uniform with button was 1.30mins/sec while those used by the children wearing uniform with Velcro was 0.45mins/sec. Therefore, the null hypothesis which stated that there is no significant difference in the time used

by pre-school children in wearing uniform with button and their counterparts wearing uniform with Velcro was rejected.

**Null Hypothesis 3**: This null hypothesis state that there is no significant difference in the time used by pre-school children in undressing uniform with button and their counterparts undressing uniform with Velcro.

Table 4.10: Independent t-test statistics on the difference in the time used by preschool children in undressing uniforms with button and their counterparts in undressing uniform with Velcro

| | Status | N | Mean | S.D | S.E | Df | T calculate | t | P |
|---|---|---|---|---|---|---|---|---|---|
| **Time used in undressing uniform by preschool** | undres uniform on | 30 | 0.964 | 0.437 | 0.079 | 58 | 9.77 | 1.96 | 0.00 |
| | undres uniform cro | 30 | 0.168 | 0.083 | 0.015 | | | | |

*Calculated t > 1.96, sig (p) < 0.05*

Results of the independent t-test statistics revealed significant differences in the time used by preschool children in undressing uniform with button and their counterparts undressing uniform with Velcro. Reason being that outcome of calculated t value of 9.77 is greater than the 1.96 t-critical values at df 58, while the calculated p value level of 0.000 is less than the 0.05 alpha level of significance. The mean time used by children in undressing uniform with button was 0.9643 while those used by the children undressing uniform with Velcro was 0.1687. Therefore,

the null hypothesis which states that there is no significant difference in the time used by preschool primary school children in undressing uniform with button and their counterparts undressing uniform with Velcro is hereby rejected.

## 4.4 Discussion of Findings

The research work was on the use of Velcro fastener in production of uniforms for pre-school children in federal capital Territory, Abuja. In order to achieve the objective of the study, the researcher sewn pre-school children uniforms one with button just like the one being used presently (pre-test and control), while the other one was sewn with Velcro fastener (experimental). Two schools were selected each from Early child care centre II (Nursery II / ECC II) comprising of thirty pupils each from the two schools namely Abaji East primary school FCT and Sabon-Gari primary school Abaji, FCT where pupils were timed each with the aid of stop watch on wearing and undressing uniform with button and on wearing and undressing uniform with Velcro and time were recorded.

In research question one**:** there was mean time of 2.29mins/sec and 0.65mins/sec between the control group timed on wearing and undressing uniform with button and the experimental group timed on wearing and undressing uniform with Velcro, which showed that the mean time for the control group that used uniform with button was higher. The statistical testing of null hypothesis one, revealed that there was significant difference between the two groups, which showed that uniform sewn with Velcro was suitable and more convenient for wearing hence it took lesser time in wearing and undressing by the pupils. This is in line with Conyngham (2003) who reported that clothing children in suitably designed wears was a big development in many countries. This was because according to the report, children's clothing usually followed the

adult fashion, which made them not suitable and convenient. Anya (1991) also pointed out that well designed clothes had features that made them suitable for children. The observation was consistent with Claim and Jon (1988) where it was observed that there must be a totally different approach in designing for pre-school child as compared to younger children.

In research question two of this study, the mean time of 1.30mins/sec and 0.45mins/sec between the wearing uniform with button and wearing uniform with Velcro showed that the time for wearing uniform with button took longer time than the time used in wearing uniform with Velcro indicated significant differences. The Statistical testing of null hypothesis two which also revealed that there was significant difference between the experimental and control groups. Hence the time for wearing uniforms with Velcro by experimental group time was lower as such can aid pre-school children's punctuality to centre, hence it made pre-school children dress easier and faster. This observation was consistent with Weber (1990) who pointed out that the use of Velcro as hook and loop had a form which can be used in small pieces to replace a zipper or provide an adjustable closing applied at seam of parts to permit easier dressing. He also said that sewing for kids of pre-school age involves the use of hook and loop fasteners instead of buttons and buttonholes that it made it easier for young children to dress themselves. The finding is also in line with Rathus (2006) who said that the major developmental task of the child from ages 2 to 3 is acquiring a sense of autonomy and independence from parents, this can be clearly seen when the child is beginning to dress and undress itself. This implied that Velcro can be used as suitable fastener on pre-school clothing for easy dressing.

In the research question three: there was mean time of 0.96mins/sec and 0.17mins/sec between the two groups when undressing uniform with button and when undressing uniforms with Velcro. This showed that the mean time for the control group that used uniforms with button was

higher in time than the experimental group who used uniforms with Velcro. Further test of the item using null hypothesis three also revealed that significant difference existed between the control and experimental groups. This implied that uniforms sewn with Velcro are faster in undressing than uniforms constructed with button fastener for pre-school children's independent care to meet toilet needs. This finding is in line with Craig (1973) who pointed out that it is important to have reasonable self confidence that one can help children to acquire comfortable and effective garment for their different age groups. It is also in line with the report of Okeke (1990) who opined that due to the technological advancement in the world, many pre-school children's garments are being produced but these garments did not stress simplicity, comfort, ease of care, self-help and made no adequate allowance for growth. That is, children clothing should take care of self help. Aldrich (2006); said that the designer must understand the requirements and the life styles of children at different ages and it is easier to start the young child with undressing rather than dressing. This means that uniform sewn with Velcro will solve the pre-school problem of undressing easily.

## 4.5 Summary of Major Findings

The following were the summary of the major findings of the work:

1. There was significant difference between uniforms sewn with Velcro and those sewn with button fastener, for the convenient self dressing by pre-school children. The level of significant in the mean time for research question one is 1.64min/sec difference.

2. There was significant time difference in wearing uniforms sewn with Velcro and in wearing uniforms sewn with button fasteners by pre-school children. The level of significant in the mean time for research question two is 0.85min/sec difference.

3. There was significant difference in time used in undressing uniforms sewn with Velcro and in undressing uniforms sewn with button fasteners by pre-school children. The level of significant in the mean time for research question three is 0.79min/sec difference

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary

The study titled "The use of Velcro fastener on the production of clothing for pre-school children in FCT Abuja. The major objective of the study was to examine the use of Velcro in the production of clothing for pre-school children in FCT Abuja. The study stated three specific objectives, and three research questions and three null hypotheses were postulated. The research questions and null hypotheses were formulated so as to provide statistical validity to various solutions preferred for the objectives of the study.

The research design for the study was experimental design. 5066 of all Public Early Child Care Centre's II (ECC II) that is, Nursery II pupils in FCT Abuja. Sixty pupils were selected as samples for the study. The technique used in the selection of samples for the study was simple random sampling even though the two schools used for the study were selected purposively from sixteen schools in Abaji Local Education Authority (LEA) of FCT Abuja. The instrument used for collection of data for the study were the pupil uniforms with present fastener – I (PUPF-I) and pupil uniforms with Velcro fastener – II (PUVF – II). Data collected from the study as pre-test and post test were statistically analyzed. The three null hypotheses were tested at 0.05% level of significance, using the independent t- test statistics. From the analysis, null hypotheses one, two and three were rejected.

The findings from the data analyzed revealed that there was significant difference between uniforms produced using Velcro and those produced using button fastener in the suitability for convenient self dressing by the pre-school children who on the wearing of the uniforms sewn

with Velcro was faster to wear than wearing uniform sewn with button fasteners by pre-school children, revealed significant difference. There were also significant differences in time used in undressing the uniforms sewn with Velcro and in undressing uniforms sewn with button fasteners by pre-school children. The result showed that it took longer time for the pupils to undress uniforms with buttons than uniforms with Velcro.

## 5.2 Conclusion

Following the analyses of the data collected as well as the findings of the study, it was discovered that the control group timed on wearing and undressing uniform with button had mean time of 2.29mins/sec while experimental group timed on wearing and undressing uniform with Velcro had mean time of 0.65mins/sec. Thus, the mean time for the two uniforms clearly showed that uniforms with button took longer time of 1.64mins/sec than uniforms with Velcro which indicated that uniform with Velcro proves to be more convenient for pre-school children self dressing and undressing. It was also discovered that the time used for wearing uniform constructed with Velcro fastener was 0.45mins/sec and the time used for wearing uniform constructed with button fastener was1.30mins/sec. The different of 0.80mins/sec implies Velcro fastener suitability for pre-school children's aid for punctuality to centre. The thirty pupils timed for undressing uniforms with Velcro had mean time of 0.17mins/sec and the thirty pupils timed for undressing uniforms with button fastener, had mean time of 0.96mins/sec, which showed that mean time used for undressing uniforms with button was longer than the mean time used for undressing uniforms with Velcro by 0.79mins/sec mean time difference, indicating that undressing uniforms with Velcro is more effective for pre-school children to meet independent care for toilet needs.

Conclusively, based on Pieget theories, giving the child the freedom to start dressing and undressing at the pre-school age not only develops the child's sensorimotor stage but also builds minor motor muscle, self confidence, and self control. It is also clear that the psychological and physical development of the child was considered in literature reviewed while this comparative study between Velcro fasteners and buttons critically dealt with the timeframe for dressing and undressing of the preschool children. Velcro has been ascertained as an effective fastener as compared to the use of buttons. From the study, it has proven to be time saving for the teacher especially when the child wants to use toilet and punctuality to the centre.

## 5.3 **Recommendations**

The following recommendations are put forward based on the findings:

- Parents should endeavour to use Velcro fastener in the openings of pre-school children uniforms for its suitability and convenience for the children.
- Headmasters and teachers of pre-school centre's should be adequately involved in the encouraging the sewing of pre-school uniforms with Velcro in the openings as it will help them to solve problems of undressing and dressing of the children when they are in need of toileting.
- Pre-school children psychological comfort and stability for learning and confidence within the age groups should be enhanced with Velcro as suitable fastener.

- Both present parents and future parents should take note of suitable Velcro fastener in the sewing of their children uniforms for safety of their human time management and financial resources.
- The Government and Private schools should endeavor to use suitable Velcro fastener in the production of uniforms for the early child care centres in Federal Capital Territory Abuja to serve as role model centre's uniform for other state schools.

## 5.5 Suggestion for Further Studies

- The researcher wishes to suggest that further studies should be carried out in similar topic in another state for the purpose of generalization.
- Velcro can also be examined in the production of clothing for disables.

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APPENDIX 1

PRE-TEST, POST TEST

**Sample data for the pilot study from two Nursery/primary schools in Samaru, Zaria**

| **Time(minutes &second) for wearing dress with button in Foundations Nursery /Primary Schools Samaru, Zaria** | **Time(minutes & seconds) for wearing dress with Velcro in Gods Time Nursery and Primary School Samaru, Zaria** | **Time(minutes & seconds) for undressing dress with Velcro in Gods Time Nursery and primary school Samaru, Zaria** | **Time (minutes & seconds) for undressing dress button in Foundations Nursery/Primary Schools Samaru, Zaria.** |
|---|---|---|---|
| 2.04 | 0.24 | 1.04 | 2.34 |
| 2 | 0.3 | 1.04 | 3 |
| 3 | 0.2 | 1.2 | 2.3 |
| 2 | 0.22 | 1.22 | 2.1 |
| 1.3 | 0.5 | 1.1 | 2.27 |
| 1.4 | 0.45 | 1.11 | 2.52 |
| 2 | 0.36 | 1.15 | 2.5 |
| 1.55 | 0.2 | 1.1 | 2.58 |
| 2.01 | 0.3 | 1.3 | 3.15 |
| 1.58 | 0.2 | 1.1 | 3.1 |
| 2.06 | 0.25 | 1.06 | 2.33 |
| 1.46 | 0.2 | 1.1 | 3 |
| 1.47 | 0.37 | 1.14 | 3.21 |
| 1.3 | 0.34 | 1.25 | 2.4 |
| 1.2 | 0.2 | 1.2 | 3 |
| 2 | 0.25 | 1.25 | 3.01 |
| 1.3 | 0.22 | 1.05 | 2.47 |

| | | | |
|---|---|---|---|
| 2 | 0.26 | 1.16 | 3.05 |
| 1.4 | 0.21 | 1.2 | 2.47 |
| 2.3 | 0.28 | 1.8 | 3.21 |

**APPENDIX II**

**T-Test: RESULTS OF THE PILOT STUDY FOR UNDRESSING UNIFORM**

**Group Statistics**

| | group | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| time | time to undressing uniform with button | 20 | 1.7687 | .44760 | .10009 |
| | time for undressing uniform with velcro | 20 | .2775 | .08705 | .01946 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| time | Equal variances assumed | 32.633 | .000 | 14.625 | 38 | .000 | 1.49115 | .10196 | 1.28474 | 1.69756 |
| | Equal variances not assumed | | | 14.625 | 20.435 | .000 | 1.49115 | .10196 | 1.27875 | 1.70355 |

The independent t-test statistics was used because the pupils were selected from two independent schools. One school was used for undressing uniform with button while the other was used for undressing uniform with Velcro. Both groups were timed. The result showed that there was significant difference between both independent samples. This is because the calculated p value of 0.000 is less than the 0.05% alpha level of significance. Their calculated mean times were 1.7687 and 0.2775 for undressing uniform with button and undressing uniform with Velcro. This means that time for undressing uniform with Velcro is significantly lower than time for undressing uniform with button. Consequently, the null hypothesis is hereby rejected.

**APPENDIX III**

**T-Test: RESULTS OF THE PILOT STUDY FOR WEARING UNIFORM**

**Group Statistics**

| | group | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| time | time to wearing uniform with velcro | 20 | 1.1785 | .16468 | .03682 |
| | time for wearing uniform with button | 20 | 2.7005 | .37172 | .08312 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| time | Equal variances assumed | 37.699 | .000 | -16.742 | 38 | .000 | -1.52200 | .09091 | -1.70604 | -1.33796 |
| | Equal variances not assumed | | | -16.742 | 26.181 | .000 | -1.52200 | .09091 | -1.70880 | -1.33520 |

The independent t-test statistics was used to test this hypothesis because the pupils were selected from two independent schools. One school was used for wearing uniform with button while the other school was used for wearing uniform with Velcro. Both groups were timed. The results showed that significant difference exist between both independent samples. This is because the calculated p value of 0.000 is less than the 0.05% alpha level of significance at a degree of freedom value of 38. Their calculated mean times were 1.1785 and 2.2705 for wearing uniform with Velcro and wearing uniform with button. This means that time for wearing uniform with Velcro is significantly lower than time for wearing uniform with button. Consequently, the null hypothesis is hereby rejected

**TABLE 3.1.2: POPULATION OF THE STUDY:**

PUPIL'S ENROLMENT BY SCHOOL, CLASS AND GENDER. CATEGORY: PUBLIC EARLY CHILD CARE DEVELOPMENT EDUCATION, 2011/2012 ACADEMIC SESSION IN ABAJI LEA

| S/N | NAME OF SCHOOL | YEAR ESTAB. | ECC 1 | | | | ECC 2 | | | | ECC 3 | | | | TOTAL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | M | F | T | STREAM | M | F | T | STREAM | M | F | T | STREAM | M | F | T | STREAM |
| 1 | ABAJI EAST PRY. SCH | 2001 | 22 | 34 | 56 | 2 | 29 | 30 | 59 | 1 | 23 | 22 | 45 | 1 | 74 | 86 | 160 | 4 |
| 2 | ABAJI SOUTH PRY. SCH | 2002 | 30 | 20 | 50 | 1 | 20 | 10 | 30 | 1 | 10 | 11 | 21 | 1 | 60 | 41 | 101 | 3 |
| 3 | ABAJI WEST PRY.SCH | 2004 | 41 | 20 | 61 | 1 | 30 | 25 | 55 | 1 | 0 | 0 | 0 | 0 | 71 | 45 | 116 | 2 |
| 4 | GAWU CENTRAL | | 25 | 14 | 39 | 1 | 19 | 11 | 30 | 1 | 0 | 0 | 0 | 0 | 44 | 25 | 69 | 2 |
| 5 | GEGBE | | 12 | 17 | 29 | 1 | 19 | 11 | 30 | 1 | 0 | 0 | 0 | 0 | 31 | 28 | 59 | 2 |
| 6 | MADELEGI | 2006 | 12 | 13 | 25 | 1 | 13 | 18 | 31 | 1 | 0 | 0 | 0 | 0 | 25 | 31 | 56 | 2 |
| 7 | MODEL PRY SCH | 1995 | 21 | 22 | 43 | 1 | 25 | 18 | 43 | 1 | 18 | 14 | 32 | 1 | 64 | 54 | 118 | 3 |
| 8 | NAHARAT SABO | 2007 | 30 | 20 | 50 | 1 | 20 | 27 | 47 | 1 | 0 | 0 | 0 | 0 | 50 | 47 | 97 | 2 |
| 9 | NUKU PRY. SCH | 1998 | 25 | 24 | 49 | 1 | 19 | 26 | 45 | 1 | 29 | 20 | 49 | 1 | 73 | 70 | 143 | 3 |
| 10 | PANDAGI | 2009 | 17 | 27 | 44 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 27 | 44 | 1 |
| 11 | SPS AGYANA | 2002 | 25 | 28 | 53 | 1 | 26 | 21 | 47 | 1 | 0 | 0 | 0 | 0 | 51 | 49 | 100 | 2 |
| 12 | SPS YABA | 2005 | 68 | 52 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 68 | 52 | 120 | 1 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0 | | | | | | | | | | | | | |
| 13 | SABON-GARI ABAJI | 2005 | 21 | 28 | 49 | 3 | 20 | 26 | 46 | 2 | 18 | 27 | 45 | 2 | 59 | 81 | 140 | 7 |
| 14 | SPS ABAJI | 2006 | 54 | 66 | 120 | 4 | 47 | 49 | 96 | 3 | 38 | 18 | 56 | 2 | 139 | 133 | 272 | 9 |
| 15 | YELWA GAWU | | 18 | 12 | 30 | 1 | 12 | 8 | 20 | 1 | 10 | 7 | 17 | 1 | 40 | 27 | 67 | 3 |
| 16 | NAHARATI TSOHO | | 443 | 415 | 858 | 22 | 319 | 305 | 624 | 17 | 146 | 119 | 265 | 9 | 908 | 839 | 1747 | 48 |

Source: Universal Basic Education Board, FCT Abuja.

**Table 3.1.2** showed the list of 16 public Schools in Abaji with Early Child Care Centres. The classes include ECC1, ECC2 and ECC3 representing Nursery 1, 2, 3 respectively. The ECC2 with total numbers of 319 male pupils and the total numbers of the female are 305 pupils.

**APPENDIX IV**

**BACK VIEW: FEMALE UNIFORM SOWN WITH VELCRO FASTENER**



**APPENDIX V**

**FRONT VIEW: FEMALE UNIFORM SOWN WITH VELCRO FASTENER**



**APPENDIX VII**

**MALE UNIFORM SOWN WITH VELCRO FASTENEROPEN**



**APPENDIX VII**

**MALE UNIFORM SOWN WITH VELCRO FASTENER CLOSED**



## APPENDIX VIII

### Hypothesis 1

## T-Test

**Group Statistics**

| | status | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| suitability_of_garment | Control (Abaji East Pri Sch Abaji FCT) | 30 | 2.2943 | .69554 | .12699 |
| | Experimental (Sabongari Pri Sch, Abaji FCT | 30 | .6519 | .42281 | .07719 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| suitability_of_garment | Equal variances assumed | 3.916 | .053 | 11.052 | 58 | .000 | 1.64247 | .14861 | 1.34499 | 1.93994 |
| | Equal variances not assumed | | | 11.052 | 47.858 | .000 | 1.64247 | .14861 | 1.34364 | 1.94129 |

## Hypothesis 2

## T-Test

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| time for wearing uniform | Equal variances assumed | .692 | .409 | 8.370 | 58 | .000 | .84700 | .10119 | .64445 | 1.04955 |
| | Equal variances not assumed | | | 8.370 | 55.342 | .000 | .84700 | .10119 | .64424 | 1.04976 |

**Group Statistics**

| | status | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| time for wearing uniform | wearing uniform with button | 30 | 1.2967 | .43272 | .07900 |
| | waeing uiform with velcro | 30 | .4497 | .34632 | .06323 |

# APPENDIX X

## Hypothesis 3
## T-Test

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| time for undresing uniform | Equal variances assumed | 51.730 | .000 | 9.777 | 58 | .000 | .79567 | .08138 | .63276 | .95857 |
| | Equal variances not assumed | | | 9.777 | 31.087 | .000 | .79567 | .08138 | .62971 | .96163 |

**Group Statistics**

| | status | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| time for undresing uniform | undressing uniform with button | 30 | .9643 | .43793 | .07995 |
| | undressing uiform with velcro | 30 | .1687 | .08312 | .01518 |