

The Harmful Effect of Non-Cotton Fabric on Children's Health in Abeokuta Township of Ogun State

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Abstract

Clothes are important covering for children's body and can serve as an effective means of ensuring their healthy growth and development. This study examines the harmful effect of non-cotton fabric on children's health in Abeokuta township of Ogun State. One hundred mothers and care givers were purposively randomly selected from three government owned and one private hospitals in the study area. Data collection was through the means of questionnaire comprising of 20 questions on the subject matter and the questionnaires collected were analyzed using descriptive statistics. Result reviewed cotton, polyester, spandex, rayon, acrylic and nylon as fabric materials used for children clothing. Also body heat, blistering and redness of skin, sweating and eczema are identified as possible effect of non-cotton fabric for children clothing. In conclusion, children's clothing should be thoroughly washed in non-toxic detergent, sundried and ironed to kill harmful chemicals from organic or natural fibre materials. The study recommends that synthetic and chemical treated fabrics should be avoided for children's wears and government should regulate raw materials used in the production of children clothing by fabric/textiles industry.

Keywords: Fabric, Cotton, Chemical, Children, Fibre, Health and Non-Cotton

Introduction

Fabric is connected with humanity and has touched so many lives, beginning from the ancient times when primitive people used flax fibers, separated into strands and plaited or woven into simple fabrics colored with dyes extracted from plants. For thousands of years before the introduction of synthetics fibers, the four great fibers in the fabric industry were flax, wool cotton and silk, all products created from natural, rapidly renewable and abundant sources. Innovators developed synthetic fabrics to overcome some of the inherent limitations of natural fibers. Cotton and linen wrinkle, silk requires delicate handling and wool shrinks and can be irritating to the touch. According to Okeke (2011) the main types of fabrics are natural fabrics and man-made fabrics. Natural fabrics made of both animal and plant sources include; cotton, wool, linen and silk

- (a) **Cotton:** come from cotton boll (plant). It can be woven, pressed by heat into flannel or used as knits. Good for almost all purposes, such as apparel, craft, quilting baby and children's accessories. As a natural fiber, cotton 'breathes' which makes it

comfortable to wear. For quilters, cotton is fabric of choice, it handles and sews easily.

- (b) **Linen:** comes from flax (plant). Real linen wrinkle easily, but is cool and like cotton, linen ‘breathes’ making it a good choice for summer apparel. Linen is also great for table top accessories. To maintain its crispness, linen is often dry-cleaned. For a softer look, many linen can be hand-washed.
- (c) **Silk:** comes from silk worms. The collection process has intricacy and explains why silk is often expensive. Silk can have either a smooth finish or a ruffle finish (raw silk) and usually dry-cleaned.
- (d) **Wool:** comes from animal coats (the animal is not harmed) known for its warmth, wool is often blended with man-made fibers. Good for apparel, especially outer wear. Usually dry cleaned but some may be hand washed.

Man-made Fabrics: These comprise of fabrics made of natural and chemical sources they include;

- (a) **Polyester:** when it was first introduced, polyester became a favourite fabric for apparel. It is easy to care for and keep its shape and color well. The disadvantage of polyester is that it does not ‘breathes’ which means it retains body heat and moisture and its fibers. Depending on the manufacturer, polyester fabrics have different names, among which are Dacron, Fortel, Kodel, Trevira. Polyester may be offered in the form of knits, jerseys or cotton and silk-like fabrics.
- (b) **Rayon:** It was the first manufactured fiber developed; it was made from wood or cotton pulp and was first known as artificial silk. The first crude artificial silk was manufactured by dipping a needle into liquid mulberry bark pulp and gummy rubber to make threads. A safe and a practical method of making artificial silk that came to be known as Viscose rayon was later discovered (Okeke 2011). Rayon is most often used for apparel. Depending on its construction, it looks like linen. Rayon too has brand names such as Acrylic. It is more absorbent than polyester and usually is best dry -cleaned.
- (c) **Nylon:** Sometimes Nylon is mixed with other fibers for apparel. Some Nylon brand names are Antron and Viviana. Nylon is often a major fiber in Knits, nylon tricot(underwear) nylon velvet and stretch swim wear.
- (d) **Acrylic:** (Brand names include Acrilan, Creslan, Orion) is often used as a substitute for wool, in sweaters fleece wear and outer wear. Like wool, acrylic is warm and wrinkle resistant. One of its advantages is that it is usually machine washable.

For the consumer, the most toxic part of clothing comes from fabric treatments. Chemicals that resist flames resistant chemicals which are often very hard to remove through washing are embedded in some fabrics. The organic trade has developed voluntary organic standards including bleaching, dyeing, product assembly, storage and transportation, pest management

and labeling. Choosing any kind of organic cotton product over conventional cotton keeps chemicals out of the fibre and protects human health. But the best option is to buy organic cotton from companies that also avoid chemical bleaches, dyes and finishers (Forsberg, K. and Mansdorf, S.Z. (2007).

The use of cotton for fabric is known to date to prehistoric items. It is well known that every consumer product has an impact on the user. However, an average consumer does not know which product is less or more impact that the other one. Any product which is made or used could be considered effective on the consumer or user which might be harmful in some cases. The textile industry is shared between natural fibres such as wool, silk, linen, cotton and hemp and man-made ones, the most common one which are synthetic fibres (Polyamide acrylic) made from petrochemicals. Most of the clothes in the wardrobes worn for children contain polyester and lycra. These cheap and easy care fibres are becoming the textile industry solution. Non-cotton fabrics like nylon, polyester and spandex are harmful to children's health. These materials surround a child with additional harmful chemicals which tend to contaminate the child's health. It is very important to try to limit children exposure to harmful chemicals and unprofitable wears that can be highly toxic (Ziegal and Blarecom 2012, Tate and Glission 2018). This study is to identify the suitability of cotton fabrics for children wears as a means of promoting good child health care and consequently aid prevent infant mortality.

Statement of the Problem

Children are more vulnerable to the effects of toxic chemicals in clothes than adults; their immune system and central nervous system are immature and still developing which means their bodies are generally less capable of eliminating toxins. Detoxing these chemicals can be especially hard and sometimes inevitable damage may be irreversible. Clothes are the next-to-skin cover for children's body and can serve as an effective means of ensuring their healthy growth and development. This study is to examine the harmful effect of non-cotton fabrics on children's health in Abeokuta township of Ogun State.

Objective of the Study

The main objective of the study is to find out harmful effects of non-cotton fabrics on children's health in Odeda Local Government Area of Ogun State. Specifically this study is to

- i. Identify different cotton fabric wears for children
- ii. Assess different non-cotton fabric wears for children
- iii. Examine likely harmful effect of non-cotton fabrics on children's health
- iv. Proffer possible solutions to the effect of non-cotton fabrics on children's health

Research Questions

1. What are the different cotton fabrics wears for children?
2. What are the different non-cotton fabrics wears for children?

3. What are the likely harmful effects of non-cotton fabrics on children's health?
3. What are possible solutions to the effect of non-cotton fabrics on children's health?

Significance of the Study

This study would enlighten parents on the appropriate fabrics to use for children's wears as well as the required care for children's clothing so as not to endanger their children's health through unsuitable clothing. The study would also promote children's healthy living thereby reducing the rate of infants' mortality in the study area.

Literature Review

Cotton Fabrics

Cotton is a soft, fluffy staple fiber that grows in a boll, or protective capsule, around the seed of cotton plants of the genus *Gossypium* in the family of *Malvaceae*. The fibre is almost pure cellulose. The fiber is most often spun into yarn or thread and used to make a soft, breathable textile. The use of cotton for fabric dated back to prehistoric time; fragments of cotton fabric dated from 500BC have been excavated in Mexico and Indus valley civilization. It was the invention of the cotton gin that so lowered the cost of production that led to its widespread use, and it is the most widely used natural fiber in clothing today (Okeke 2011).

Types of Cotton

1. **Batiste:** Very fine, soft, usually sheer cotton, often used for handkerchiefs, nightwear, and children's dresses.
2. **Cambric:** Tightly, woven cotton, usually in solid colours, such as cambric blue. Used in apparel especially casual shirts
3. **Chino:** This is cotton twill that has been pre-shrunk and mercerized. Most often used for sport pants and other sport wears.
4. **Flannel:** Very soft cotton, usually with a nap. Used in baby wear. For children apparel but it must be flame retardant
5. **Khaki:** strong cotton weave-used in uniforms and other items that require strength.
6. **Terry:** Woven on knitted cotton pile with loops on one or both sides. It is often used for toweling due to its absorbency
7. **Lawn:** Cotton lawn is a fine, crisp, combed cotton fabric, used in children's wear, night wear and traditional quilting.

Man-Made Fabrics (Non-Cotton or Synthetic Fibers)

Synthetic fibres are known for durability and cheap cost. All textile fabrics manufactured prior to 1884 were made of the natural fibres, wool, silk, cotton and linen. Fabrics are now manufactured entirely of synthetics or mixed as a larger percentage with natural fibers.

Clothing that repels water, is resistant from wrinkles and that is long-lasting and durable is most likely composed of polyester. Polyester is a man-made fibre that is derived from petroleum and is known to be extremely unsustainable even though is misconceived to be recycled(Okeke 2011).

Today, 70% of synthetic fiber production is polyester. Antimony is a silvery white metal found from the earth's core that does not dissolve easily or evaporate, it enters the environment during the mining process. Most children clothing is produced with antimony for the sole purpose of creating fire resistant infant clothing. 75% of acrylic manufactured is used in clothing, specifically knit wear that is combined with other synthetic or wool to produce socks or apparel wear. It is also made from oil, and is non-biodegradable. Acrylic manufacturing involves toxic substances which require careful storage, handling and disposal. The polymerization process can result in an explosion if not monitored properly. According to the centre of Disease control and prevention, acrylonitrile enters the body through skin absorption, as well as inhalation and ingestion. Nylon like polyester is made from petrochemicals leaving it be non-biodegradable meaning that it does not break down naturally. Nylon creates nitrous oxide when manufactured.

The Dangers of Synthetic and Treated Fabrics

Mosley and Gray (2008) opined that the chemicals in clothing include the following:

1. Formaldehyde: makes in dyes and adds durability
2. Phthalates: used in dyes and adds durability
3. Flame Retardants
4. Silver Nanoparticles: makes item antibacterial
5. NonylphenolEthoxylates (NPE)

a. Formaldehyde

This chemical is used to create wrinkle easy care or shrinkage free garments and is used on synthetic and cotton fibers. It release unto the air to be inhaled as well as being absorbed through the skin. It is classified by the EPA as a known human carcinogen ,which has been linked to causing leukemia. Formaldehyde cause an 30% increase in change of living cancer and 30% increase in lung/skin irritation or contact dermatitis which can lead to cancer. This can happen for wearing clothes that are marked waterproof, anti-static and wrinkle-free. It is also used to set colored fabrics including bed sheets. It is said that dark colored synthetics provide the highest risk of contact dermatitis which can form rather quickly without prior symptoms. Washing does not eliminate formaldehyde; it can only reduce the level present.

b. Phthalates

These are pronounced 'thalates' which are a man-made chemical derived from petroleum. They are used in plastics, cosmetics, perfumes, and clothing to add durability and stability their use in apparel, lies in the dyes used to colour the fabric.

Even though they can be flushed out of the body within hours of absorption, most people are constantly exposed to it. The danger they pose is hormone disruption, especially testosterone.

c. **Flame Retardant**

Flame retardant use began when children's sleep wear need to be self-extinguishing and the solution was to add brominates Tri. Today most synthetic fabrics contain a new generation of flame retardants bonded into the fabrics, which must survive more than fifty times washing.

d. **Silver Nanoparticles**

Silver is usually not thought of being toxic, especially because people take silver supplements. But when it comes to nano-particles; these are used in many workout clothes such as polyester. It has been that silver is more harmful at the nano level and that they do not differentiate bad bacteria from good bacteria.

Harmful Effect of Non-Cotton Fabrics on Children's Health

From the sheets made of certain materials the body absorbs many toxics through the skin and therefore whatever one puts on the skin will have one effect or the other. Continuous buildup of toxins in the body through clothing will cause various health effects such as allergies, extreme sensitive among others:

- i. Contact dermatitis (which can lead to cancer)
- ii. Leukemia
- iii. Hormone disruption (mostly reproduction)
- iv. Damage of liver and kidney function

The chemicals that are causing these problems are wide ranging and exist in mostly synthetic fabrics, but also in cotton which is highly treated most of the time. The reason for using these chemicals is usually to add features that will add value to the consumer and make the clothing items more appealing to purchase. The more the synthetic clothing worn for children; the more the risk of absorbing toxic chemicals that can precipitate health conditions.

Benefits of Cotton Wear

The need for the choice of cotton fabrics for children's wear cannot be over-emphasized in the opinion of Polhemus (2005). They include the following;

- i. Cotton is a natural, 100% organic fabric
- ii. It is soft and do not rub harshly against children's skin
- iii. It's fabric permits better aeration and will keep the children cool. The nature of cotton permits it to absorb and remove body's moisture easily
- iv. Since it is a natural fabric, cotton is non-allergic. Therefore, we don't have to worry about children breaking out in rashes of eczema

- v. Cotton is perfect for children who suffer from asthma because unlike other materials, it does not release small particulate matter that can trigger an attack.
- vi. Cotton is durable and easy to use
- vii. Cotton fabric wash and dry easily. They can be tumble dried or hung up to dry
- viii. It is easier to clean cotton fabrics than other kinds of fabrics. They release dirty and grime easily; so there is no need to use harsh soaps and chemicals to get rid of stains and dirt on cotton fabrics. A mild children detergent and some warm water will be sufficient for washing cotton clothes.
- ix. Unlike synthetic materials, cotton clothes and blankets can be washed in hot water. The fabric can endure high temperature without affecting its quality or durability. Therefore, cotton fabrics can be sterilized making it perfect for children's health.
- x. Synthetic products are often treated with plenty of chemicals to give them good finish. These chemicals can cause rashes on children's skin. Cotton on the other hand is not subjected to such finishing treatments. This makes it perfects for children's skin.

The chemicals with which non-cotton fabrics are made of can endanger children's health just as cotton fabric contrary to this can foster desirable healthy growth in a child hence the need for the adoption of cotton fabrics for children's clothing.

Methodology

Survey Research method was adopted in the study

The study was carried out in Abeokuta metropolis. Abeokuta is the state capital of Ogun-State the "Gateway" State located in the Southwest of Nigeria.

Population for the study include all the nursing mothers and care-givers in the study area

Sampling Procedure and Sample size

A purposive random sampling technique was used in selecting 100 mothers and caregivers for the study from Three (3) governments and One (1) private hospital. (Forty) 40 respondents were purposively chosen from Oba Ademola Maternity Hospital in Abeokuta South due to the high population of nursing mothers been the only government maternity hospital in the study area while 20 respondents each were chosen from General Hospital Iberekodo in Abeokuta North Local Government area, General Hospital Odeda in Odeda Local Government area and Sacred Heart Private Hospital Lantoro in Abeokuta South Local Government.

Data Collection and Analysis

Data collection was through structured questionnaire purely based on the subject matter. The instrument was validated using the test-retest method. Modified Four point likert scale was used, their ratings are; strongly agreed-4, agreed-3 disagreed-2 and strongly disagreed-1. Data analysis was through the means of simple descriptive statistics such as frequency counts and means

Results and Discussion

Table 1: Different Types of Cotton Fabrics for Children Wears

S/N	Items	Mean (X)	Std. Dev.	Decision
1	Lawn fabric is a cotton material used for children wear.	2.50	.739	Agree
2	Batiste cotton are very soft and soothing to children skin	2.63	.734	Agree
3	Seersucker i.e. crinkly cotton fabric is very breathable, cool and can be used for children’s sport wear	2.63	.849	Agree
4	Flannel cotton is a good choice for children’s wear as it is a natural a durable and comfortable fabric	3.05	.957	Agree
5	Khaki cotton can serve suitable house wear dress for children	2.55	.898	Agree
	Grand mean	2.62	0.84	Agreed

Table 1 revealed different types of cotton and fabric wears for children which include lawn fabric, batiste cotton, seersucker, flannel cotton and khaki cotton. A grand mean of 2.62 and standard deviation of 0.84 established the types of cotton and fabric wears for children in the study area.

Table 2: Different Types of Non-Cotton Fabric Wears for Children

S/N	Items	Mean (X)	Std. Dev.	Decision
1	Polyester	3.24	0.0025	Agree
2	Spandex	2.59	.911	Agree
3	Rayon	3.23	0.25	Agree
4	Acrylic	2.64	1.020	Agree
5	Nylon	2.60	.865	Agree
	Grand Mean	2.86	0.61	Agreed

Table 2 showed the different types of non-cotton fabric wears for children. It was discovered that polyester fabric and spandex fabric are major non-cotton fabric wears for children. A grand mean of 2.86 and standard deviation of 0.61 revealed this.

Table 3: Harmful Effects of Non-Cotton Fabrics on Children’s Health

S/N	Items	Mean (X)	Std. Dev.	Decision
1	Polyester fabric retains body heat and moisture and it is not comfortable for children	3.11	.958	Agree
2	Nylon fabrics contain torridity (heat) which can cause eczema on children skin	3.18	.976	Agree
3	Viscose rayon contains sulphuric acid which can cause pain, redness and blistering on children skin	3.12	.869	Agree
4	Acetate fabric contains allergy which can asthma if children are exposed to it	3.13	.931	Agree
5	Acrylic fabric retains heat, wearing clothes made from this material in warmer environment make children sweat and may affect their respiration.	2.95	1.008	Agree
	Grand Mean	3.09	0.95	Agreed

Table 3 with a grand mean of 3.09 and a standard deviation of 0.95 revealed the harmful effects of non cotton fabrics on children’s health. It was showed that wearing clothes made from some non-cotton material in warmer environment make children sweat and may affect the respiration of children.

Table 4: Possible Solutions to the Effect of Non-Cotton Fabrics on Children Health

S/N	Items	Mean (X)	Std. Dev.	Decision
1	Children clothes should be thoroughly washed in non toxic detergent and sundried after washing before wearing it	2.63	1.004	Agree
2	Children wears should be ironed after washing for the heat to kill the harmful chemicals	3.06	.900	Agree

3	Use of synthetic and chemically treated fabrics should be avoided for children wears	3.06	1.008	Agree
4	Creating regular awareness, orientations, seminars and workshops to mothers and care- givers on children's clothing	3.07	1.056	Agree
5	Designers should employ the use of natural fibre fabric materials for the production of children wears	2.51	1.077	Agree
	Grand Mean	2.77	1.00	Agreed

The result in table 4 shows possible solutions to the effect of non-cotton fabrics on children health. A grand mean of 2.77 and standard deviation of 1.00. Findings revealed that creating regular awareness, orientations, seminars and workshops to mothers and care givers on children's clothing can promote the usage of suitable wears for children's clothing

Discussion of Findings

The study revealed that there are different cotton fabric wears for children's such as lawn fabric batiste cotton and flannel cotton, batiste cotton are very soft and is not harsh against children skin, flannel cotton is a good choice for children wear as it durable, comfortable and natural. This agreed with Polhemus (2005) who opined that cotton wears are soft to the skin The different non-cotton fabrics wears for children identified are polyester, spandex and nylon fabric. The chemical with which these fabrics are made are injurious to children's tender and low resistance skin

The likely harmful effect of non-cotton fabrics on children health, include retention of body heat and moisture, acetate in acetate fabric can cause asthma if children are exposed to it. Viscose fabric contains sulphuric acid which can cause pain, redness, and blistering for children skin, thus the need to avoid the usage of non-cotton fabric for children's clothing.

The study also revealed possible solutions to the effect of non-cotton fabrics on children health among which are the choice of natural fabrics materials such as cotton, linen, silk and wood for children's wear washing children's wear in non-toxic detergent and ironing it. According to Hayhoe and Chungiven (2009) adequate care must be given to clothing as it is needful for such wears to serve its purpose. Also pregnant and expectant women, mothers and care- givers should be given orientation on the need to avoid synthetic and chemically treated fabrics for children wears in other to ensure children's healthy growth thereby relieving mothers and care-givers undue stress during child care

Conclusion

In conclusion, it has been identified from the responses of the respondents that cotton is a natural organic fabric and permits better aeration and keep the children cool and comfortable. The study revealed that fabric breathe and since this is more pronounced in cotton fabric, it will make it functional and more comfortable for children wearing clothing made of cotton materials. The use of natural fabric materials for children's wear made them grow well unlike synthetic fabrics (acrylic fabric) that retains body heat and it is not comfortable for children.

Recommendations

This study makes the following recommendations;

1. Parents and guardian must wash children clothing thoroughly before wearing it. Also the clothes must be properly ironed for the heat to kill the harmful chemicals that may be present in the fabrics.
2. Orientation must be given to Parents to choose natural fabric material such as cotton, linen, silk and wool for children wears as well as avoid synthetic chemically treated fabrics. Anti natal caregivers must do this
3. Children clothes should always be washed in non-toxic detergent and sundried. Air drying should be done only in polluted area.
4. Orientation on the use of clothing made of Anti-natal caregivers must Parent should always buy clothes made from organic or natural fibre for their children as much as possible
5. Government should regulate the raw materials used in the clothing and textiles industries

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