INTERNATIONAL JOURNAL OF CURRENT INNOVATIONS IN EDUCATION
VOL. 9 NO. 1 MAY 2026, UNITED STATES OF AMERICA. ISSN: 2646-7380

PRODUCTION OF FABRIC FROM RAFFIA FIBER AND SENSORY EVALUATION OF BABY'S DRESS CONSTRUCTED USING RAFFIA FIBRE

By

Myrtle Ibokette

And

Elijah, Inemesit Monday
Department of Home Economics Education
Faculty of Vocational Education, Library and Information Science
University of Uyo, Uyo.

ABSTRACT

This study explored the production of fabric from raffia fibre and the sensory evaluation of a baby's dress constructed from the fabric. Raffia fibres were extracted, dyed, and woven into fabric, which was then used to create the baby's dress. Sensory evaluation was conducted with 10 panelists to assess key attributes like softness, comfort, appearance, etc. The results showed that raffia fibres are strong and durable, making them suitable for structural applications. However, the woven fabric scored lower in terms of softness (5.1) and comfort (4.9). The sensory evaluation of the raffia dress revealed moderate ratings for appearance (7.1) and texture (5.9), but comfort was found lacking, indicating that raffia may be better suited for accessories or decorative items rather than garments meant for prolonged wear. Findings showed that there was no significant difference in the sensory evaluation of the baby's dress produced from raffia fabric, was partially accepted. The study concluded that while raffia has potential in sustainable textile production, its limitations in softness and comfort suggest it is more suitable for decorative applications. It was recommended among others that raffia processors should blend raffia with softer fibres to enhance its viability in garment production. This research adds to the knowledge of eco-friendly textile alternatives in fashion.

KEYWORDS; Fabric, Raffia Fiber, Sensory Evaluation, Baby's Dress.

INTRODUCTION

Raffia is derived from the leaves of the Raffia palm (*Raphia farinifera*), native to tropical regions, particularly in Madagascar and parts of Africa. It is one of the most versatile natural fibres, known for its strength, durability, and flexibility. Raffia is often used to create a wide range of products, including textiles, baskets, hats, and decorative items (Omolaye *et al.*, 2018). This versatile fibre has been used for centuries by various cultures for a wide range of applications, including weaving, basketry, and construction (Emevwo and Aluyor, 2019). The origin of raffia can be traced back to ancient African civilizations, where it was valued for its strength, flexibility, and durability. Over time, raffia has gained popularity beyond Africa and is now used worldwide for decorative, artistic, and functional purposes (Gahungu, 2018).

The importance of raffia lies in its unique properties, which make it an ideal material for various applications. Raffia fibres are lightweight, biodegradable, and eco-friendly, making them a sustainable alternative to synthetic materials. Additionally, raffia is known for its natural beauty and rich texture, which adds a distinct touch to any product or design (Kapinga and Kullay, 2017). The production process of raffia involves several steps, starting

with the harvesting of Raffia palm leaves. The leaves are then stripped to extract the fibres, which are cleaned, spun, and dyed to achieve the desired color and texture. Finally, the raffia fibres are woven, braided, or knotted to create a wide range of products, including bags, hats, mats, and decorative items.

Raffia fibre holds significant potential as a natural, sustainable material for various applications. Despite its availability and environmental advantages, raffia is not widely utilised in places like Nigeria. This underutilisation poses a problem, particularly in a nation where both raw materials and skilled artisans exist to transform this resource into valuable products. One of the primary reasons for the limited use of raffia fibre in Nigeria is the lack of awareness about its potential applications and benefits. Raffia is often viewed as a traditional material, mainly used for making handicrafts, such as baskets, mats, and hats. There is insufficient promotion of raffia's versatility and potential uses in the modern textile and fashion industries, where it can serve as an eco-friendly alternative to synthetic materials (Omolaye *et al.,* 2018). Without adequate awareness, local industries and consumers continue to favour more popular materials like cotton, nylon, and polyester. Given the global shift towards sustainable materials, it is imperative that a study is done to address the underutilisation of raffia fibre. Doing so could have a positive impact on both the environment and the economy. The untapped potential of raffia, if properly harnessed, could promote sustainable practices, create jobs, and reduce the country's dependence on imported materials. To overcome the challenge associated with raffia's underutilisation, there is a pressing need for research and development in this area. Studies on the properties, processing, and applications of raffia can help bridge the gap between its current artisanal use and its potential as a modern, sustainable material. This study examined the production of fabric from raffia fibre and the sensory evaluation of baby's dress constructed using the fabric.

Fabric production is a crucial process in the textile industry, as it involves the creation of various types of fabrics that are used for clothing, household items, and other purposes. The quality of the fabric produced is dependent on several factors, including the raw materials used, the manufacturing process, and the equipment and technology employed (Williams and Watkins, 2018). In recent years, the demand for high-quality fabrics has increased significantly, as consumers are becoming more conscious of the environmental and social impacts of their purchasing decisions. This has led to a greater emphasis on sustainable and eco-friendly fabric production processes (Cucinotta et al., 2019). One important aspect of fabric production is meeting the requirements and standards set by regulatory bodies and industry associations. These requirements cover various aspects of fabric production, including the use of safe and non-toxic materials, compliance with environmental regulations, and adherence to ethical labor practices (Wang *et al.,* 2020). In order to ensure that fabric production meets these requirements, manufacturers must invest in state-of-the-art technology, employ skilled professionals, and implement stringent quality control measures throughout the production process. By doing so, manufacturers can not only meet regulatory requirements but also enhance the overall quality and sustainability of their fabric production operations (Cucinotta et al., 2019).

Sewing is the process of joining two or more pieces of fabric together using a needle and thread. It is one of the oldest textile arts, with evidence of hand-sewn garments dating back thousands of years. Sewing has evolved over time from a purely manual craft to a complex industrial process, with modern sewing machines revolutionising garment

production. While sewing remains a fundamental skill in both traditional and industrial contexts, its importance has only grown with advancements in technology and the diversification of textile applications. Sewing is essential in the construction of garments. Without proper sewing techniques, fabric pieces cannot be assembled into functional clothing. The choice of stitches and seams impacts the durability of a garment, ensuring it can withstand wear and tear over time. Well-sewn garments tend to have longer lifespans, providing better value to consumers and contributing to more sustainable fashion practices (Williams and Watkins, 2018).

Adekunle *et al.* (2019) carried out a study on sensory evaluation of baby garments made from natural fibres, focusing on raffia and its potential for children's clothing. They constructed baby dresses from raffia fabric and cotton, using 20 mothers to assess comfort, texture, and appearance. The evaluation was based on a Likert scale that measured parameters such as softness, fit, and visual appeal. The results showed that while the raffia fabric scored low in softness compared to cotton, it was appreciated for its durability and eco-friendly appeal. Mothers recommended its use in combination with softer linings. The study found that raffia could be used for baby garments if treated to enhance its tactile properties. This study relates to the main research as it focuses on evaluating the sensory aspects of raffia garments, specifically for baby clothing. It explores how users perceive the comfort and texture of raffia, providing useful comparisons and practical considerations for sensory feedback.

Furthermore, Okoye, Nwosu and Onyekwelu (2020) examined the sensory evaluation of baby's clothing made from raffia fiber fabric. They used a basic block pattern drafting method to create patterns for baby dresses, adapting the designs to account for the stiffness and unique texture of raffia fabric. The researchers applied hand-weaving techniques to soften the fabric for garment construction. The study showed that raffia fabric presented challenges in pattern adaptation due to its lack of elasticity and rigid nature. However, with appropriate modifications, such as adding darts and panels for better fit, the fabric was successfully used to create aesthetically appealing baby dresses. The authors recommended using softer or treated raffia to enhance comfort. This study relates to the main research as it explores the technical challenges and adaptations required when drafting patterns for baby clothing from raffia fabric. Both studies focus on constructing garments from raffia, providing insights into the specific considerations needed for creating wearable baby dresses from this material. This study examined the production of fabric from raffia fiber and sensory evaluation of baby's dress constructed using raffia fibre.

Statement of the Problem

The global textile industry is heavily reliant on synthetic fibres such as polyester, nylon, and acrylic, which are widely used due to their affordability, durability, and ease of production. However, the increasing use of synthetic fibres presents significant environmental challenges. These fibres are non-biodegradable, contributing to persistent plastic pollution and microplastic contamination in water bodies, which pose threats to marine life and human health. Additionally, the production of synthetic fibres is energy-intensive and relies on fossil fuels, further exacerbating the problem of carbon emissions and environmental degradation. As concerns about climate change and sustainability grow, there is an urgent need for alternatives to synthetic materials, with a particular focus on renewable, biodegradable natural fibres. Natural fibres such as cotton, wool, and hemp have been recognised for their environmental benefits, but the search for more diverse, sustainable materials is ongoing. Raffia fibre, derived from the leaves of the Raffia palm, is a promising natural alternative that has been underutilised, particularly in Nigeria where the raw material

is abundant. Despite its availability, raffia fibre has not been widely adopted in the textile industry in Nigeria, largely due to limited awareness of its potential applications, and a lack of research on its use in modern fabric production. This gap in knowledge and utilisation presents an opportunity for further study, particularly on how raffia fibre can be effectively transformed into fabric for garments, including sensitive applications like baby clothing. The production of fabric from raffia fibre could provide a sustainable alternative to synthetic textiles, addressing both environmental and economic concerns. However, for raffia fabric to gain wider acceptance, it is essential to evaluate its practical and sensory properties, particularly in the context of its use for baby clothing. Baby garments demand soft, non-irritating fabrics that provide comfort and safety, making sensory evaluation a critical aspect of the study. There is a lack of research on the tactile qualities, comfort, and overall suitability of raffia fabric for baby clothing, which hinders its potential adoption. This study examined the problem of synthetic fibre reliance by investigating the production of fabric from raffia fibre and conducting a sensory evaluation of a baby dress constructed with raffia fabric.

Purpose of the Study

This study examined the production of fabric from raffia fibre and sensory evaluation of baby's dress constructed using raffia fibre. Specifically, the study sought to:

i. Examine how to draft a pattern for a baby's dress
ii. Conduct the sensory evaluation of the baby's dress produced from raffia fabric.

Research Questions

The study sought to answer the following questions:

i. What is the outcome of pattern drafted for a baby dress constructed from raffia fabric?
ii. What is the sensory evaluation of the baby's dress produced from raffia fabric?

Research Hypotheses

One null Hypothesis was formulated to guide the study and tested at 0.05 level of significance:

HO^1: There is no significant difference in the sensory evaluation of baby's dress produced from raffia fabric.

Material and Method

This study adopted an experimental design. This chapter represents the procedure that was used in carrying out the study under the following sub-heading: Sample collection and Preparation, sensory evaluation and statistical analysis.

Sample Collection and Preparation

The raffia leave was gotten from the farm in Essien Udim Local Government Area, Akwa Ibom State. Dye was purchase from a popular market in Essien Udim Market (Udua Akpan). The material used for the production of fabric from raffia fibre will include: Matchet used for cutting the raffia leaf and Lather used to climb the raffia tree

Materials used for the production of raffia fabric included Raffia used for making fabric and Local loom for weaving the fabric. Material used for drafting baby's dress included:

i. French curve: is a curved ruler used for drawing smooth line
ii. Carbon papers: to transfer pattern

iii. Ruler: used for measurement
iv. Erazer: to clean errors
v. Brown paper: to draft the pattern
vi. Pencil: for sketching
vii. Tape: for measuring the shape
viii. Tracing wheel: to trace the pattern

Material for sewing babies dress

i. Tape: for measuring the shape
ii. Sewing machine: to stitch the fabric
iii. Needle: to fix in the machine and stitch
iv. Thread: yarns that are used for sewing
v. Table: used to cut the fabric
vi. Scissor: used for cutting
vii. Weaving machine used for weaving the fabric

Construction of babies dress

The sensory evaluation process for the production of fabric from raffia fiber and baby dresses constructed using raffia fiber involves assessing the tactile and visual properties of the materials to ensure comfort and satisfaction. This evaluation may consist of methods such as tactile assessments, visual inspections, and feedback from individuals wearing the clothing. A study by Adekunle *et al*. (2019) focused on the sensory evaluation of raffia fiber fabric and baby dresses made from raffia fiber. The researchers utilized tactile assessments to evaluate the softness, smoothness, and comfort of the fabric, as well as visual inspections to assess the appearance and overall quality of the clothing. Feedback from parents or caregivers and observations of infants wearing the dresses were also included in the sensory evaluation process.

Baby's dress constructed and pattern was drafted using baby's measurement

Shoulder – 11 inches
Burst – 20 inches
Waist – 23 inches
Half length – 10 inches
Length – 23 inches
Sleeves – 5 inches

RESULTS

The following results were gotten from the research:

Research Question 1: What is the outcome of the pattern drafted for baby's dress?

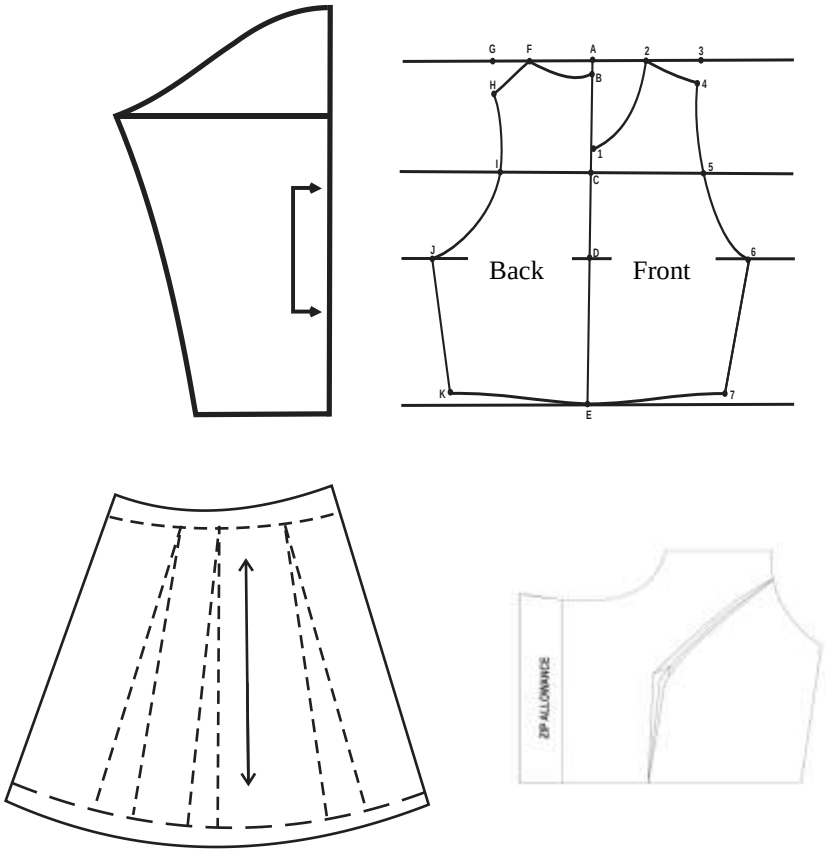

Figure 1: Pictures of baby's dress constructed from raffia fabric and cotton fabric?

Figure 2: Baby's Dress made from Raffia fabric

Baby's Dress made from Cotton Fabric

Research Question 2: What is the sensory evaluation of the baby's dress constructed using raffia fabric?

Sample	Appearance	Colour	Softness	Smoothness	Texture	Drape	Fabric scent	Comfortability
RM	7.1	6.7	5.1	5.8	5.9	6	6.8	4.9
CM	8.6	8.6	8.8	8.6	8.5	8.3	8.4	8.6

Table 1 indicates that in terms of appearance, colour, softness and smoothness, baby dress made from cotton material scores 8.6, 8.6, 8.8 and 8.6 while those made from raffia material scores 7.1, 6.7, 5.1 and 5.8 respectively. In terms of texture, drape, fabric scent and comfortability, baby dress made from cotton material scores 8.5, 8.3, 8.4 and 8.6 while those made from raffia materials scores 5.9, 6.0, 6.8 and 4.9 respectively. This implies that baby dress made from cotton material is preferred to those made from raffia material in terms of appearance, colour, softness, smoothness, texture, drape, fabric scent and comfortability.

Discussion of findings

The pattern drafted for baby's dress and constructed from cotton fabrics and raffia fabrics

The pattern drafted for a baby dress using raffia fabric showed a fair drape (6) but low scores for softness (5.1) and comfortability (4.9). These results suggest that while raffia may provide structural form, it might not be ideal for making garments without further modification. The finding is supported by the finding of Okoye et al. (2020) who examined the sensory evaluation of baby's clothing made from raffia fiber fabric and found that raffia fabric presented challenges in pattern adaptation due to its lack of elasticity and rigid nature. However, with appropriate modifications, such as adding darts and panels for better fit, the fabric was successfully used to create aesthetically appealing baby dresses.

The sensory evaluation of the baby's dress constructed using raffia fabric

The sensory evaluation results indicate that the baby dress made from raffia fabric needs improvement, especially in terms of comfort (4.9) and softness (5.1). Other properties, like appearance (7.1) and texture (5.9), were rated moderately well. Finding also showed that there was no significant difference in the sensory evaluation of the baby's dress produced from raffia fabric and those produced from cotton. This implies that although the appearance and colour of the raffia dress were well-received, the comfort and texture ratings were lower, suggesting a difference between raffia and more comfortable fabrics like cotton. This indicates that raffia fabric may have applications in fashion where appearance is prioritised over comfort, but it may not be ideal for garments requiring softness and flexibility. The finding is in agreement with the findings of Adekunle *et al.* (2019) who carried out a study on sensory evaluation of baby garments made from natural fibres, focusing on raffia and its potential for children's clothing and reported that while the raffia fabric scored low in softness compared to cotton, it was appreciated for its durability and eco-friendly appeal.

CONCLUSION

This study demonstrated the potential of raffia fibre in garment production. The fibres extracted from raffia leaves were strong and capable of being woven into fabric, though they exhibited certain limitations in terms of comfort and flexibility. The woven raffia fabric produced a baby dress that was visually appealing but lacked the softness and smoothness typically associated with cotton. Sensory evaluation results revealed that while the raffia baby dress performed well in appearance and durability, it was less acceptable in terms of comfort, softness, and texture.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

1. To enhance the comfortability of raffia fabric, it is recommended that further research be conducted into refining the extraction and processing methods of raffia fibres. Softening treatments may improve the fabric's texture and make it more suitable for sensitive clothing like baby garments.
2. Given its durability and ability to absorb dye well, textile industry should use raffia fabric in fashion accessories, bags, or decorative clothing where comfort is less of a priority. Its visual appeal makes it suitable for garments intended for short-term wear or decorative purposes.
3. Fashion designers should explore the possibility of blending raffia fibres with softer materials such as cotton or silk. This could improve the overall comfort and texture while retaining the unique properties of raffia.

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