

Development Of Decorative Top Using Artistic Macramé Knots

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Abstract

Macramé is a traditional knotting technique that has gained renewed attention in sustainable and handcrafted fashion due to its artistic appeal and versatility. The present study aimed to design, develop and evaluate an innovative macramé top for its aesthetic appeal and consumer acceptability. An experimental research design was adopted comprising the selection of suitable macramé cords, preparation and evaluation of knots, development and selection of knot combinations, creation and selection of top designs, selection of cord colour and accessories, product development, cost determination and consumer acceptability assessment. Fifty-five cord samples and ten macramé knots were initially evaluated by a panel of thirty experts using a three-point preferential choice index and Weighted Mean Scores (WMS) were calculated for selection. Based on expert preferences, the most suitable cord, knots, knot combinations, apparel design, colour and accessories were selected for product development. The developed tops were evaluated by sixty consumers for design, knot combination and overall appearance. Top II received the highest consumer preference with an average weighted mean score of 2.77, indicating superior aesthetic appeal and acceptability. Cost analysis further revealed that the developed product could be produced at a reasonable cost, demonstrating good commercial potential. The study concludes that traditional macramé techniques can be successfully integrated into contemporary apparel to develop sustainable, aesthetically appealing and marketable handcrafted fashion products while contributing to the revival of this traditional textile craft.

Key words: Macramé, Ornamental Knotting, Knot Combination, Handcrafted Fashion, Sustainable Textiles, Consumer Acceptability, Textile Embellishment.

Introduction

Macramé, one of the oldest forms of textile ornamentation is a unique craft that combines artistic creativity with technical skill through the systematic arrangement of decorative knots (Shehzadi, 2024). As a handmade textile technique, it not only represents a rich cultural heritage but also the enduring relationship between craftsmanship, functionality and aesthetic expression. Owing to its simplicity, versatility and ability to transform ordinary cords into intricate decorative structures, macramé has remained an important craft across different civilizations for centuries. In the present era, where sustainable fashion, handcrafted products and slow design practices are gaining increasing attention, macramé has once again emerged as a valuable textile technique with immense creative and commercial potential (Jonathan et al., 2015).

The historical evolution of macramé reflects its enduring importance as both a functional and decorative textile craft across different cultures. Knots have always been fundamental to human textile creation in fact, one study states that "the tying of a knot is an act almost as instinctive to the human race as breathing, sleeping or eating." Decorative knotting can be traced back to early civilizations, including Byzantine and Assyrian cultures where knotted embellishments were used to decorate garments and household textiles. Macramé as a traditional art of decorative knotting that relies entirely on the manual manipulation of cords rather than the use of needles or hooks (Joseph et al., 2011). The craft gained widespread popularity across different cultures and experienced a remarkable revival during the 1960s. However, similar to many other traditional handicrafts, its popularity gradually declined with the emergence of mass-produced products and create a wide variety of products changing fashion trends. Consequently, recent studies have described macramé as a diminishing art that requires renewed attention and innovative adaptation for contemporary lifestyles (Rubina & Kaur, 2024).

With rich historical background, macramé is widely appreciated for its versatility, aesthetic appeal and creative potential. Handicrafts have always been an integral part of human society and few crafts demonstrate the flexibility offered by macramé. The technique involves the use of cords or ropes that are tied into decorative patterns using basic knots such as half knots, square knots and half hitches without the need for weaving, knitting or specialized tools. This highly adaptable technique enables artisans to create a wide variety of products ranging from home furnishings and decorative accessories to fashion apparel and utility articles (Goel, 2010).

The growing demand for sustainable and handcrafted products has created new opportunities for the application of macramé in contemporary fashion. Verma et al. (2025) emphasized the importance of promoting macramé through product diversification and skill development. Tarifu et al. (2023) highlighted its potential to support sustainable livelihoods and value-added textile products. However, as reported by Rubina and Kaur (2024), research on macramé has largely remained confined to home

furnishings and decorative articles, with comparatively limited attention given to innovative apparel development. Therefore, there is a need to explore the application of macramé in contemporary garments by integrating traditional knotting techniques with modern design concepts. Keeping this perspective in view, the present study was undertaken to develop an innovative women's macramé top, thereby contributing to the revival of traditional craftsmanship and promoting sustainable apparel design.

Materials and Methods

The present investigation was conducted to develop innovative women's tops using the macramé technique and to evaluate its aesthetic appeal and consumer acceptability. The study followed an experimental research design comprising selection of suitable macramé knots, development of knot combinations, creation and selection of apparel designs, selection of appropriate materials, product development, cost determination and assessment of consumer acceptability. The entire research methodology was carried out sequentially to ensure systematic development of the macramé top.

Selection of Macramé Cords

An extensive market survey was conducted to identify suitable macramé cords available for apparel development. Different types of cords were procured from local and online suppliers based on their fibre composition, flexibility, surface appearance, strength and suitability for garment construction. Fifty-five cord samples were collected from different markets. After preliminary screening based on texture, knot-holding ability, softness, durability and drape characteristics, thirty cord samples were shortlisted by expert evaluation. A panel of thirty experts comprising faculty members and postgraduate students specializing in Apparel and Textile Science, Fashion Design, Home Science and Art & Craft evaluated the cord samples using a three-point preferential choice index. Preferences were recorded as Highly Preferred (3), Preferred (2) and Least Preferred (1). Weighted Mean Scores (WMS) were calculated for each sample and the cord obtaining the highest score was selected for development of the macramé tops.

Preparation and Selection of Macramé Knots

Ten different macramé knots, namely flat knot, half knot, overhand knot, half hitch knot, alternative half hitch knot, double half hitch knot (cording), double chain knot with four ends, josephine knot, popcorn knot and reverse cording were prepared using the selected macrame cord. The prepared knot samples were evaluated independently by the same panel of thirty experts. Preferences were recorded using a three-point preferential choice index. Weighted Mean Scores were computed for each knot and ranks were assigned accordingly. Based on expert evaluation, the five highest-ranked knots were selected for developing knot combination designs for the macramé tops.

Development and Selection of Knot Combination Designs

The selected macramé knots were systematically combined to generate different knot combination designs suitable for apparel application. Thirty knot combination samples measuring approximately 3×4 inches were developed by arranging the selected knots in different structural sequences, maintaining visual balance and construction feasibility. Weighted Mean Scores were calculated for every knot combination and ranked accordingly. The five highest ranked knot combinations were selected for designing the macramé tops.

Creation and Selection of Designs for Macramé Tops

Five innovative design alternatives for the macramé tops were developed digitally using CorelDraw XXI software. The selected knot combinations were incorporated into scaled garment outlines by considering proper proportions, balanced placement, functionality and overall aesthetic appeal. Each design was presented to the panel of experts for evaluation using a three-point preferential choice index. Experts assessed the designs considering originality, aesthetic appeal, knot placement, balance, construction feasibility and market suitability. Weighted Mean Scores were calculated and the two highest ranked designs were selected for product development.

Selection of Cord Colour and Accessories

The selected cord was further evaluated for suitable colour options. Different colour palettes were presented to the expert panel and preferences were recorded using the preferential choice index. The colour obtaining the highest Weighted Mean Score was selected for product development. Similarly, suitable accessories including wooden beads, metal beads, plastic beads, rings, bells and crystals were assessed. Experts evaluated each accessory based on compatibility with the selected design, aesthetic enhancement and market appeal.

Development of the Macramé Tops

The selected design was developed manually using the preferred macramé cord, colour and accessory. Standard apparel measurements were followed throughout the construction process to ensure proper fit and dimensional accuracy. The development process involved preparation of the working frame, cord arrangement, execution of selected knot combinations according to the finalized design layout, incorporation of accessories wherever required, trimming of excess cords and finishing of the garment.

Cost Determination and Consumer Acceptability Assessment

The production cost of the developed macramé tops was calculated by considering the cost of raw materials, accessories, labour and finishing charges. The selling price was estimated by adding an appropriate profit margin. Consumer acceptability was assessed by sixty consumers using a three-point rating scale based on design, knot combination, colour, workmanship, overall appearance, comfort, innovativeness, marketability and cost. Weighted Mean Scores (WMS) and Average Weighted Mean Scores (AWMS) were calculated to determine the overall acceptability of the developed products.

Results and Discussion

Selection of Macramé Knots

Expert evaluation revealed a clear preference for structurally stable and visually balanced knots. The flat knot achieved the highest preference, followed by the double half hitch knot, overhand knot, half knot, double chain with four ends and josephine knot. These knots were considered suitable for apparel because they produced a uniform texture, maintained dimensional stability and enhanced the decorative appearance of the fabric. The five highest-ranked knots were selected for further design development, while lower-ranked knots were excluded due to their limited aesthetic and functional suitability.

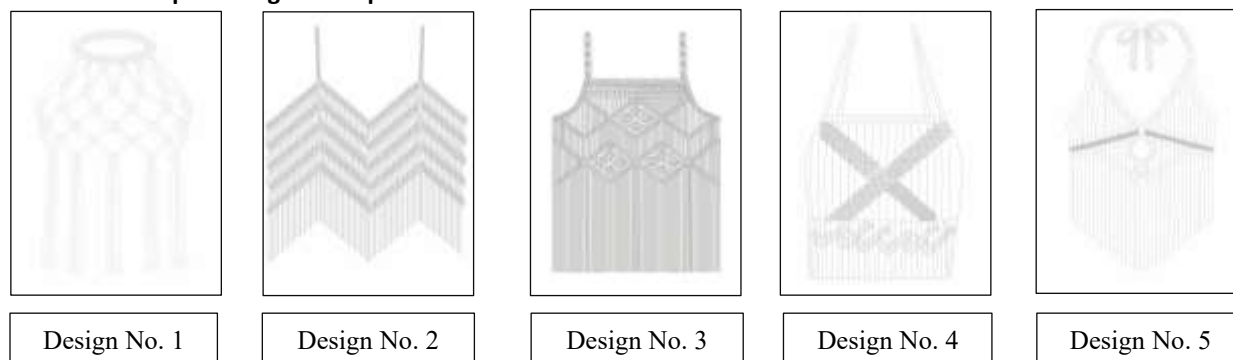
Selection of Knot Combination Designs

Among the developed knot combinations, five combinations demonstrated significantly better visual appeal than the remaining alternatives. Knot Combination 15 (1,6) emerged as the most preferred with the highest Weighted Mean Score (WMS) of 2.63, followed by 9 (1,3) with 2.60 WMS, 11 (1,3,6) with WMS 2.56, 6 (1,2,6) with 2.50 WMS and 16 (1,6) with WMS of 2.40. Their higher preference may be attributed to the harmonious arrangement of knots, balanced texture and adaptability to garment construction. These five knot combinations were selected for developing design alternatives for the macramé tops. Ampomah (2015) developed different macramé garments using appropriate materials and knot combinations. The developed products were found to be attractive, comfortable and acceptable indicating the effectiveness of macramé in contemporary apparel development.

Development of Designs for Top using Selected Macramé Knot Combinations

The selected knot combinations were interpreted into five innovative cushion cover designs and evaluated by a panel of experts for their aesthetic and functional suitability.

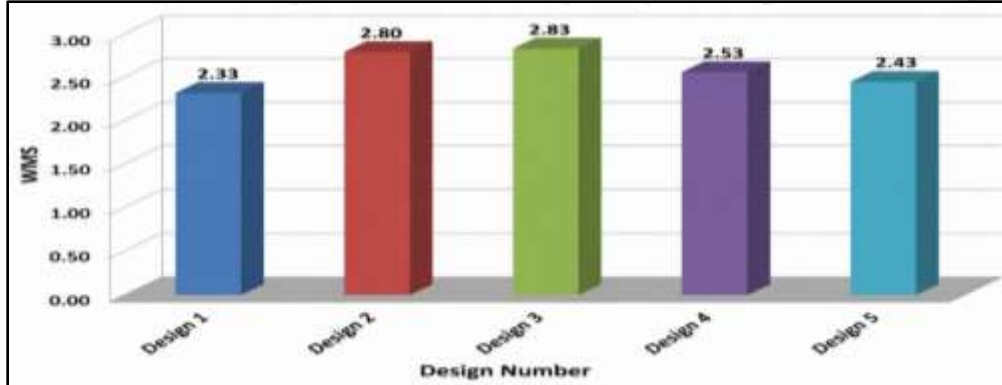
Plate 1: Developed Designs of Top



Among the five developed designs, Design Number 3 received the highest preference with a weighted mean score of 2.83 and secured Rank I, followed by Design 2 with a weighted mean score of 2.80 and Rank II. These two designs were selected for product development owing to their superior visual appeal, balanced motif placement, proportionate arrangement of decorative elements and overall design harmony. Rani (2017) developed thirty partition curtain designs using CorelDRAW 12 software. The digitally developed designs were evaluated by expert and the most preferred designs were selected for product development. The study

demonstrated that computer-aided design software facilitates systematic design development, easy modification and effective visualization of macramé products prior to construction.

Fig 1: Experts' preferences for developed top designs



Selection of Cord, Colour and Accessories

Based on expert evaluation, 3 mm cotton braided cord, the selected colours and accessories were found to be the most suitable material components for the development of the women's macramé tops. Cream was selected for Top I, whereas brick red was selected for Top II, as these colours complemented the respective designs and enhanced their aesthetic appeal. The 3 mm cotton braided cord provided adequate strength, flexibility and clear knot definition, enabling the formation of neat and well-defined macramé patterns. The selected accessories blended harmoniously with the overall design, adding decorative value without compromising the functionality of the garments. The appropriate combination of the selected cord, colours and accessories contributed to the aesthetic appeal, structural stability and overall quality of the developed macramé tops.

Development of the Macramé Top and Cost Determination

The selected top designs were developed using the macramé technique with careful craftsmanship, ensuring neat finishing and structural stability. Based on the preference evaluation, Design No. 2 (Top I) and Design No. 3 (Top II) were selected for product development.

Plate 2: Developed Tops from Macrame Technique

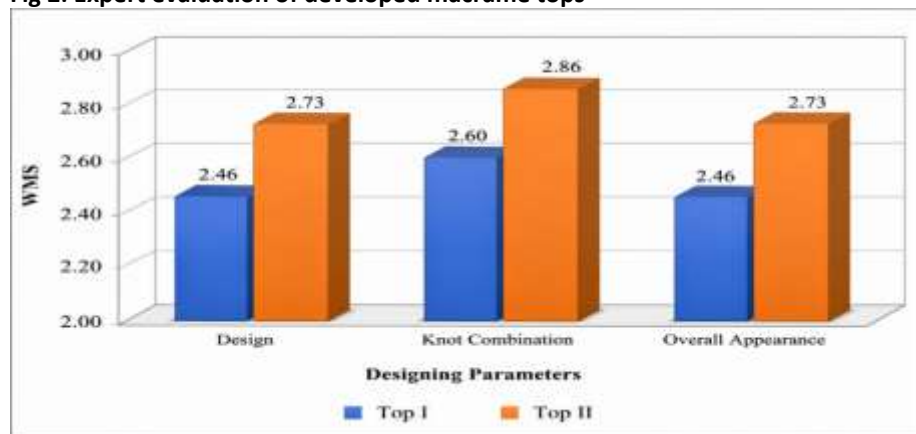


The production cost of the developed macramé top was calculated by considering the cost of cord, accessories, labour and other miscellaneous expenses. The analysis indicated that the developed top could be produced at a reasonable cost while maintaining good workmanship and aesthetic quality. The estimated cost suggests that the product has good commercial potential and can be marketed as sustainable handcrafted apparel suitable for contemporary fashion consumers. Rani et al. (2019) determined the cost of macramé partition curtains based on raw material and labour charges. The developed curtains were well accepted by consumers for their design, material suitability and reasonable cost, indicating the commercial potential of macramé products.

Consumer Acceptability of Developed Tops

The developed macramé tops were evaluated by sixty consumers on the basis of design, knot combination and overall appearance using a three-point continuum scale. The findings revealed that both developed tops were highly appreciated by the consumers with weighted mean scores ranging from 2.46 to 2.86 indicating that they were perceived as most appealing. Top II received the highest preference securing a weighted mean score of 2.73 for design, 2.86 for knot combination and 2.73 for overall appearance with an average weighted mean score of 2.77. Top I also received favorable consumer responses obtaining weighted mean scores of 2.46 for design, 2.60 for knot combination and 2.46 for overall appearance with an average weighted mean score of 2.50. The results indicate that the developed macramé tops were aesthetically appealing, well accepted by consumers and suitable for commercialization as contemporary handcrafted apparel. Rubina and Kaur (2024) successfully developed a macramé poncho and found high market acceptability (96%) and consumer acceptability (90.8%), demonstrating the suitability of traditional macramé techniques for developing contemporary apparel.

Fig 2: Expert evaluation of developed macramé tops



Conclusion

The study demonstrated that traditional macramé techniques can be effectively utilized to develop innovative and aesthetically appealing apparel. Expert evaluation enabled the selection of suitable cords, knots, knot combinations and designs, resulting in a well-crafted macramé top. Consumer assessment indicated high acceptance of the developed products, with Top II receiving the highest preference. The developed top also showed good commercial potential due to its reasonable production cost and attractive appearance. The findings confirm that macramé can be successfully integrated into contemporary fashion while promoting sustainable handcrafted products. The study contributes to the revival of traditional macramé craft through innovative apparel development.

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