



## SPORTWEAR PREFERENCES AND SATISFACTION OF KENYAN FEMALE SITTING VOLLEYBALL ATHLETES WITH PHYSICAL DISABILITIES

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**Abstract:** *Sitting volleyball is one of the most inclusive and empowering sports among athletes with physical disabilities, particularly those with amputations, spinal cord injuries, and limb weakness. Despite its popularity, sportswear needs of sitting volleyball athletes with physical disabilities has received less attention in research, particularly in Sub-Saharan Africa. This study explored the functional, expressive and aesthetic sportswear preferences and satisfaction of female sitting volleyball athletes with physical disabilities in Kenya. Structured questionnaires were used to collect data from 67 female sitting volleyball players, aged 20–65 years, and actively playing sitting volleyball. Descriptive statistics was used to summarize the level of satisfaction with the sportswear attributes. Inferential statistics were used to examine the significant differences in sportswear preferences and athletes' satisfaction, as well as assessing the associations among various sportswear attributes. Findings reveal that while the sitting volleyball athletes are more satisfied with the aesthetic ( $M=3.85$ ) and expressive ( $M=3.31$ ) sportswear attributes than functional attributes ( $M=3.31$ ). The study concludes that although satisfaction with the functional attributes was lower compared to other attributes, it has a significant relationship with both expressive and aesthetic satisfaction. This indicates that functional aspects should be more emphasized in the design of sitting volleyball uniforms to enhance satisfaction.*

**Key words:** *Sitting volleyball, functional, expressive, and aesthetic attributes, athletes' satisfaction*

### 1. INTRODUCTION

Sportswear needs and preferences of athletes have been reported in several studies. These studies indicate that functional attributes, particularly fit and comfort, are the most significant factors influencing athletes' satisfaction, followed by aesthetic attributes such as style, color, and pattern [1]. The fabrics used in sportswear play a crucial role in affecting the thermo-physiological comfort and performance of athletes through properties such as breathability, stretchability,



moisture vapor transport, and protection [2]. Although expressive attributes are considered the least important for influencing sports performance, female athletes have been documented to desire sportswear that is not only functional and attractive but also satisfies their psychological needs for identity, values, and status [3]. Similarly, Athletes with Physical Disabilities (AWPD) consider functional attributes such as comfort, fit, mobility and fabric characteristics in addition to fashionable uniforms as important to their performance enhancement. However, adaptive sportswear should camouflage the disability to make it difficult for observers to recognize it, while at the same time ensuring efficient performance [4]. Athletes with Physical Disabilities (AWPD) often experience challenges in accessing suitable sportswear that are relevant to their specific sport [4], [5]. This often results in barriers to their sports' participation, hence isolating them from the community. For instance, wheelchair rugby players in the UK reported challenges with fit and the inability to regulate body temperature [5]. The study proposed design recommendations to meet the athletes' needs for fit, thermal comfort and safety while also stressing the need for inclusive design approaches. Similarly, a study of wheelchair-bound tennis players in India revealed challenges related to ease of movement, poor fit, excessive sweating and heat generation [4].

The sportswear preferences of junior AWPD revealed great dissatisfaction with attributes such as fit, mobility and weight [6]. However, the study was confined to one region, and included only two sitting volleyball players. Moreover, the study examined sportswear needs for various sports, including football, netball, chess, and scrabble which vary significantly in movement and levels of physical activities compared to sitting volleyball. In all the databases of Kenya, there is a dearth of information and data addressing the specific sportswear needs of sitting volleyball AWPD. This study aimed to address these gaps by examining the functional, expressive and aesthetic sportswear preferences of sitting volleyball AWPD in Kenya to guide in the development of more suitable sportswear solutions.

## **2. METHOD**

### **2.1 Sample and Data Collection**

A cross-sectional survey was conducted to examine the sportswear preferences and satisfaction of 67 female sitting volleyball AWPD aged 20-65 years ( $M=36.5$ ) in Kenya. Participants were identified through snowball sampling, drawn from 8 county sitting volleyball teams at selected sports grounds, including Kasarani and Nyayo National Stadium, during training and competitions. Ethical clearance and permission were obtained from the relevant bodies (Research Permit No. NCST/RCD/14/013/487) before data collection. Data was collected using structured questionnaires, physically administered by the researcher to athletes who had played sitting volleyball for at least 1 year. The items in the questionnaire were measured using a 5-point Likert scale ranging from 1=Strongly Disagree, to 5=Strongly Agree.

### **2.2 Data analysis**

The data was analyzed using descriptive statistics to identify the sportswear preferences and satisfaction of female sitting volleyball athletes with physical disabilities. Pearson's correlation coefficients was used to identify the most preferred sportswear attributes in shaping athletes' preferences and satisfaction. ANOVA was used to measure the statistical significance of the sportswear preferences and satisfaction among the athletes. Fishers Least Significant Difference (LSD) post hoc test was performed to identify the specific sportswear attributes that differed significantly. Pearson's correlation coefficient was then used to compare the relationships among



three sportswear attributes. All the statistical tests were conducted at 95% level of confidence, with significance determined at  $p < 0.05$ .

### 3. RESULTS AND DISCUSSION

#### 3.1 Instrument Reliability

Cronbach's alpha was used to assess the internal reliability of the questionnaire items measuring the three sportswear attributes: the functional, expressive and aesthetic aspects. This revealed a reliability coefficient of 0.8477, indicating a strong internal consistency across the three items measured in the study (Table 1). This suggests that all the FEA attributes are reliable for assessing the sportswear preferences of AWPDP. The average inter-item covariance of 0.2749 further suggests that the individual FEA items used to measure sportswear satisfaction are adequately correlated, but not so highly correlated to be redundant. This result confirms that combining these three attributes into a single measurement framework yields consistent and interpretable findings.

*Table 1: cronbach's alfa reliability test*

Test scale	mean (unstandardized items)
Average interitem covariance	0.2749165
Number of items in the scale:	3
Scale reliability coefficient:	0.8477

#### 3.2 Pairwise correlations between the functional, expressive and aesthetic sportswear attributes

The study found that all the correlation coefficients among the three sportswear attributes are statistically significant at  $p < 0.01$  (see Table 2):

**Functional–Aesthetic ( $r=0.785$ ):** The strong positive relationship between satisfaction with functional and aesthetic sportswear attributes implies that athletes who prioritize functional attributes of their sportswear, such as fit, comfort and mobility, also tend to have a high regard for aesthetic attributes such as color, and style [1]. These findings also support a study of female golf players who considered the most significant influence on their sportswear satisfaction with team uniforms was whether their team uniforms were comfortable and attractive [7]. However, the findings contradict a study of female inline skaters who placed somewhat greater importance on comfort than fashion for skating sportswear [8].

**Functional–expressive ( $r=0.616$ ):** the study also found a moderate positive correlation between functional and expressive attributes. This suggests that functional satisfaction is associated with expressive elements such as self-esteem, gender roles, athletic status and identity, although the link was weaker than the correlation between functional and aesthetic sportswear attributes. These findings support studies that associated good fit with positive body image, self esteem and confidence [7].

**Aesthetic–Expressive ( $r=0.672$ ):** The correlation between satisfaction with aesthetic and expressive sportswear attributes support the view that athletes who desire to wear sportswear that look good, with fashionable style are likely to derive psychological or symbolic benefits from it as well. These findings support existing studies indicating that while functionality, expressiveness, and aesthetics are distinct facets of sportswear satisfaction, they remain interrelated in shaping the overall user experience [3]. However, the findings contradict most sportswear studies on AWPDP that tend to prioritize incorporating only functional and aesthetic aspects in sportswear [1], [4], [5].



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**Table 2:** Pairwise correlations between the functional, expressive and aesthetic sportswear attributes

Variables	Functional	Aesthetic	Expressive
Functional	1.000		
Aesthetic	0.785* (0.000)	1.000	
Expressive	0.616* (0.000)	0.672* (0.000)	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

### 3.3 Comparing the relationship between satisfaction with the Functional, Expressive, Aesthetic, and satisfaction for sportswear

The study performed a One-Way Analysis of Variance (ANOVA) to determine the significant differences among the mean sportswear preference scores for the functional, expressive, and aesthetic attributes among the sitting volleyball AWPDP. Table 3 reveals that there is a high significant difference ( $p = 0.000$ ) among the mean scores for Expressive, Aesthetic, and Functional (FEA) preferences. This suggests that the variation in the sportswear preferences across the FEA attributes does not result from random chance. The high F-value (14.76) further emphasizes that at least one of these means is substantially different from the others; therefore, random chance is an unlikely explanation.

**Table 3:** Analysis of Variance

Source	DF	Adj SS	Adj MS	f-value	p-value
Factor	2	12.49	6.2455	14.76	0.000
Error	198	83.78	0.4231		
Total	200	96.27			

The study also conducted post hoc analysis using the Fisher Least Significant Difference (LSD) test to identify the specific sportswear satisfaction attributes that differed significantly (see Table 4). The results revealed that the sitting volleyball AWPDP were more satisfied with both aesthetic ( $M=3.21$ ) and expressive ( $M=3.37$ ) sportswear attributes than functional attributes ( $M=2.78$ ). However, the differences between the sitting volleyball AWPDP's satisfaction with the aesthetic and expressive attributes were not statistically significant ( $p=0.462$ ). Therefore, to improve the overall satisfaction of sitting volleyball AWPDP regarding all sportswear attributes, designers need to pay greater attention to enhancing the functional performance of their sportswear.

**Table 4:** Homogenous grouping using Fisher LSD Method and 95% Confidence

Preferences	N	Mean $\pm$ SEM
Expressive	67	3.3716 $\pm$ 0.0781 <sup>a</sup>
Aesthetic	67	3.2172 $\pm$ 0.0976 <sup>a</sup>
Functional	67	2.7828 $\pm$ 0.0576 <sup>b</sup>

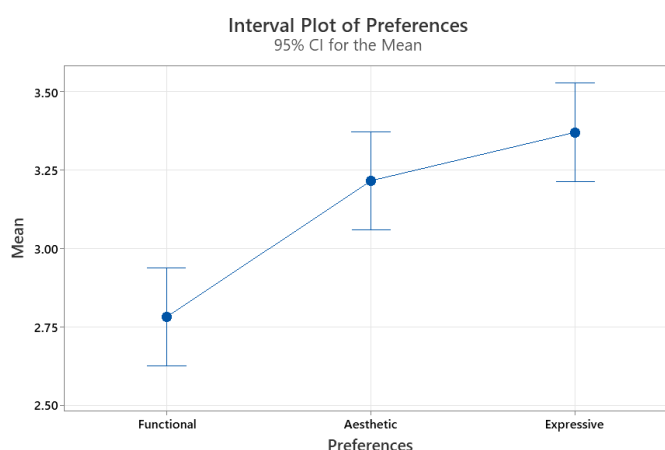
Means that do not share a letter are significantly different.

**NB:** 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Sometimes satisfied, 4 = Satisfied, 5 = Very satisfied

Tables 3 and 4 show that ANOVA and Fisher's LSD pinpoint that functional aspects lag behind the other two dimensions in terms of sportswear satisfaction. This gap indicates an opportunity for designers and manufacturers to focus on improving performance-related attributes

such as comfort, durability, protection, stretchability and fit, without neglecting aesthetic or expressive benefits that many sitting volleyball AWPD also strongly value.

From the interval plot in Figure 1, the mean scores for FEA preferences each have 95% confidence intervals shown. This plot indicates that the mean of the Functional attribute (2.8) is lower than the mean of the other two sportswear attributes, and its confidence interval does not overlap with those of Aesthetic or Expressive. Meanwhile, the intervals for Aesthetic (3.2) and Expressive (3.4) overlap, indicating no statistically significant difference between them. This plot corroborates the ANOVA and post hoc findings indicating that female sitting volleyball AWPD express lower satisfaction with functional aspects of their sportswear, while aesthetic and expressive considerations are rated higher and roughly at par with each other. These results indicate that improving the comfort, protection, and mobility in sportswear can help in raising the functional satisfaction to the level that athletes already perceive in the aesthetic and expressive domains.



**Fig. 1: Interval Plot**

### 3.4 The most important aspect of sitting volleyball athletes' sportswear

According to Table 5, participants identified multiple aspects of sportswear as important, but the highest mean scores revolved around feeling beautiful (3.836), ease of movement (3.791), and overall comfort (3.716). These three elements all fell within the “Satisfied” range, indicating that, on average, the athletes view these features as well-met by their current sportswear. Furthermore, the idea of “feeling good about the body” scored a mean of 3.567, suggesting that apparel that foster positive self-esteem are also significant [7], [8].

**Table 5: The most important aspect of the sportswear**

The most important aspect of my sportswear is that:	Mean	Interpretation
It makes me feel beautiful	3.836	Satisfied
It allows me to move freely	3.791	Satisfied
It feels comfortable when worn	3.716	Satisfied
It makes me feel good about my body	3.567	Satisfied
It fits me well	3.433	Sometimes satisfied
It protects me from injury	2.343	Dissatisfied
Overall mean	3.424	Sometimes satisfied

**NB:** 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Sometimes satisfied, 4 = Satisfied, 5 = Very satisfied



#### 4. CONCLUSIONS

Although functional needs are considered the most important aspect of most sportswear, this study found that female sitting volleyball AWPB in Kenya expressed more satisfaction with expressive and aesthetic attributes of their uniforms than with the functional aspects. This reveals a critical need to improve the functional aspects of their sportswear by incorporating features such as fit, comfort, and mobility. Unlike previous studies, which mainly focused on the general sportswear needs of AWPB or able-bodied athletes, this research provides sport-specific insights to guide the development of inclusive sportswear that enhances performance.

#### REFERENCES

- [1] H. Jin & C. Black, "Assessing functional and aesthetic clothing needs of young male tennis players". Int. Journal of Fash. Design, Tech. and Educ., 5(2), 145-150, 2012.
- [2] E. Codau & T. Codau, "Effect of elastane on moisture management in high-performance sportswear", Annals of the University of Oradea, Fascicle of Textiles, Leatherwork Vol. 25 No. 1, 2024.
- [3] P. Emerich, "Designing Women's Snowboarding Clothing: Application and Expansion of The FEA Consumer Needs Model", (Masters' thesis). Colorado State University, 2011.
- [4] N. Bairagi & S. K. Bhunyan, "A Review on Adaptive Sportswear", International Journal of Research Publication and Reviews, Vol 2, no 12, pp 1053-1064, December 2021.
- [5] S. Bragança, I. Castellucci, S. Gill, P. Matthias, M. Carvalho & P. Arezes, "Insights on the apparel needs and limitations for athletes with disabilities: The design of wheelchair rugby sports-wear". App. Ergonomics, 67(April), 9–25, 2018. <https://doi.org/10.1016/j.apergo.2017.09.005>
- [6] S. Njeru, "Junior Sportspersons Living with Physical Disabilities' [Dis]Satisfaction Level with Selected Active Sportswear Attributes: Implications for Sustainable Apparel Design for Social Inclusion in Kenya", Sustainable Design in Tex. and Fashion, 53-83, 2021.
- [7] K. L. Wheat & M. A. Dickson, "Uniforms for collegiate female golfers: Cause for dissatisfaction and role conflict"? Cloth. and Tex. Research Journal, (11)7, 1-10, 1999.
- [8] M. A. Dickson & A. Pollack, "Clothing and identity among female in-line skaters". Clothing and Textiles Research Journal, 18(2), 65-72, 2000. doi:10.1177/0887302X001800201