Junior Sportspersons Living with Physical Disabilities' [Dis] Satisfaction Level with Selected Active Sportswear Attributes: Implications for Sustainable Apparel Design for Social Inclusion in Kenya

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Abstract Persons Living with Disabilities (PLWDs) constitute 15% and 2.2% of the total world and Kenyan population respectively. Learners with disabilities and special needs have been inactively involved in sporting activities, even though participation in sports endows them with academic and psycho-social benefits. Globally, there exists a dearth of research on active sportswear for PLWDs. Consequently, in Kenya active sportswear worn by junior sportspersons living with physical disabilities (JSLWPDs) is ill-fitting, oversize, unattractive and widely limits their desired mobility. Active sportswear is identical to that for able-bodied sportspersons. This essay explores the JSLWPDs' [dis]satisfaction level with selected active sportswear attributes through a study conducted in Masaku School for the Physically Challenged, employing mixed-method research design. The population comprised 60 JSLWPDs. Judgement sampling was adopted to select the respondents who filled semi-structured questionnaires. Focus group discussion, artefact analysis and fieldwork photography augmented data collection. Data analysis entailed quantitative and qualitative techniques. The JSLWPDs' dissatisfaction level is significantly higher than the satisfaction level concerning selected active sportswear attributes: function/usability, fit, freedom of movement and sportswear weight. Chi-square test revealed a significant difference in the [dis] satisfaction level among the attributes. The dissatisfaction level is at par for both genders. Consequently, dissatisfaction inhibits their social inclusion and enjoyment of sports. Evidently, active sportswear fashion actors' product development is unsustainable because they disregard the JSLWPDs' special apparel needs. The research is envisaged to inform the co-design of JSLWPDs' intelligent adaptive active sportswear that shall empower them academically and within the bio-psychosocial continuum for social inclusion.

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1 Introduction

Afrika is characterised by a predominantly youthful demographic aged 15–24 years that constitute slightly more than 20% of the total population [39] and includes those living with disabilities. Persons Living with Disabilities (PLWDs) constitute 15% (1 billion) of the total world population. Disability prevalence is higher for developing than developed countries [42]. In Kenya, PLWDs comprise 2.2% (0.9 million) of the total population with more females (523,883) than males (394,330) which pose implications on the social roles undertaken by women in the society [15]. PLWDs are the most disadvantaged and marginalized groups and experience adverse socio-economic outcomes and discrimination at all levels of society: participation in sports and access to education. Girls and women are double disadvantaged: by gender and disability [23]. The Government of Kenya undertook a countrywide mass registration of PLWDs from 3rd to 7th June 2019 through the National Council for Persons with Disabilities (NCPWD), though the results have not been released. According to Handicap International [8] PLWDs educational stakeholders spread throughout Kenya comprise: special schools for the physically challenged, blind, deaf, cerebral palsied, mentally challenged, post-secondary institutions and schools with integrated units totalling 125, of which schools for the physically challenged (some are primary, secondary and others not classified) total 13. Others are community-based organisations (CBOs) and non-governmental organisations (NGOs), government ministries and institution programmes, Kenya sign language interpreters and educational assessment and resource centres. Considering that junior sportspersons living with physical disabilities (JSLWPDs) are in school, it means they are no longer confined at home as in the past. Thus, apparel styles, more specifically active sportswear must meet their newly-defined expectations, those from their peers and the community at large, thereby afford them social inclusion.

Concerns related to PLWDs' participation in sports are skewed toward physical barriers such as inaccessible and or unsuitable sporting facilities while ignoring active sportswear. Consequently, there is a dearth of research on sustainable adaptive active sportswear for consumers with physical disabilities in Afrika because studies are predominantly skewed toward the temporarily able-bodied consumers. One questionnaire item posed to PLWDs participants by KNHCR [16] was if they had adequate access to clothing, food and water among other needs. However, no finding was presented on clothing, despite it being a basic human need and a right to all persons: living with and without disabilities. Probably the researcher(s) did not deem clothing important to PLWDs, thereby inhibiting their social inclusion thus contrary to the United Nations (UN) *Sustainable Development Goal* (SDG) 16: Promote peaceful and inclusive societies for sustainable

development, provide justice for all and build effective, accountable and inclusive institutions at all levels. Botswana's and Kenya's fashion houses' founders have a combination of markets varying from "high class, male and female, middle age" to "high class/middle class/female" but they do not cater to the needs of green and elderly consumers. The prevalence of non-fashion-related qualifications among the respondents could suggest a lack of background knowledge and skills in fashion design and technical dynamics in the industry [31] especially sustainable fashion for special apparel needs end-users who comprise JSLWDs. The elderly persons experience similar physical disabilities to the JSLWDs. None of the fashion houses' collections in Botswana and Kenya includes active sportswear which refers to clothing and accessories such as shoes, socks, gloves, watches and headbands worn by sportspersons during training, racing and official opening and closing of athletics competitions.

The academia in Kenya more so postgraduate research has to some extent failed to practically address sustainability issues. Njeru and M'Rithaa [27] posit that fashion stakeholders' increasingly complex conundrums persist for lack of practical solutions by doctoral candidates notwithstanding that, research outcomes in design-related disciplines such as fashion design need designing. For example, a doctoral research outcome could be a capsule wardrobe for a specific consumer group/stakeholder such as JSLWDs. The authors strongly recommend a paradigm shift to taught-doctorate programmes that incorporate practical/studio-oriented units and the alignment of doctoral research to national and international development goals and research agendas *inter alia* sustainability. Consequently, fashion design doctoral candidates should competently engage in emerging discipline-specific issues especially applied trans-disciplinary research in sustainability as well as human-centred approaches.

The Paralympic Games are the equivalent competition for athletes with disabilities. The Games classify disabled athletes into six categories: wheelchair athletes, amputees, athletes with cerebral palsy, visual impairment, intellectual impairment and "*les autres*" meaning others such as dwarfism, multiple sclerosis and arthritis of major joints among others [33]. Learners with disabilities and special needs have not been actively involved in sporting, cultural and recreational activities [23], thereby constraining the attainment of UN *SDG* 4: Ensure inclusive and equitable high-quality education and promote lifelong learning opportunities for all. However, participating in sports especially for PLWDs profoundly improves academic performance, self-esteem, solidarity and team building; creates a positive self-concept, self-actualisation and social adjustment; counters discrimination and inequality and; offers a chance for enjoyment and enhancement of good bodily health [40] (Bukala Personal Communication 2015). With proper training, Bukala (Personal Communication 2015) asserts that PLWDs have become renowned sports heroes and heroines, for instance, Henry Wanyoike a visually-impaired runner. In addition to training, adaptive active sportswear could enhance their participation in and enjoyment of competitive sports. In Kenya, annual national special-needs education sports competitions for primary school pupils are held in various parts of the country. Sportspersons engage with diverse actors such as dealers, agents,

coaches and managers who play a pivotal role in the acquisition of appropriate active sportswear and their logistics.

Sustainable participation in any sport requires suitable active sportswear. Sportswear has inspired fashion and research but no study has been conducted in Kenya on active sportswear for JSLWPDs. Sports-Inspired Fashion (SIF) refers to high fashion/designer clothes inspired by active sportswear in a collaboration between the sportswear industry and designers. SIF reflects the characteristics of many sports games in silhouettes, colours, and details. It is predicted that sport will continue to be an important source of inspiration for fashion designers [20] as this study envisions and enhances the social inclusion of JSLWPDs. Kinuthia et al. [17] studied factors that influence brand loyalty among Kenyan swimmers. From the study, it can be inferred that the swimmers select their own sportswear. The authors call for similar research with other sporting groups of consumers. Kinuthia et al. [17] focused on one sportswear attribute: brand loyalty. This essay presents findings of numerous active sportswear attributes for a marginalized sporting consumer namely JSLWPDs. Ko and Zhang [18] conducted a cross-cultural study using a self-administered questionnaire on the moderating effects of nationality and lifestyle on the relationship between brand equity and purchase intentions between Korean and Chinese sportswear consumers: college and graduate students of both genders. However, the study does not specify whether or not they were involved in active/competitive sport, or living with or without a disability. Schweinbenz [34] asserts that like other major sports movement in the twentieth century, the Olympic Games have been organised around gender lines. Clothing and fashion with the Games provided indicators of some of the barriers which female athletes faced, specifically sportswear. Fashion determines how female athletes experience the sport. For instance, Victorian fashion emphasised femininity through the use of the corset, the hoop skirt and bustle. Sports federations may enforce dress codes upon male and female athletes. Gender-based barriers to fashion consumption are unsustainable and in the case of the female gender, it inhibits the achievement of UN *SDG* 5: Achieve gender equality and empower/emancipate all women and girls, such as JSLWPDs. Emancipation may be social among other aspects.

1.1 Statement of the Problem

Sustainability implies a model encompassing social, economic, environmental and cultural aspects, be it in the apparel sector or any other sector. Sustainable fashion focuses on addressing challenges created by the production and consumption of fashion without discriminating against any consumer group such as PLWDs. A reconnaissance survey of leading sportswear distributors in Nairobi, Kenya revealed adaptive active sportswear for special-needs persons with unique and changing needs are lacking in the retail industry, especially as applies to JSLWPDs. Hence, active sportswear for JSLWPDs is often ill-fitting, oversize, unattractive and widely limits their experience and enjoyment of sports, desired mobility,

self-concept and social adjustment. Nonetheless, JSLWPDs seek fashionable, functional and comfortable apparel that addresses their specific special apparel needs. The special apparel needs emanate from their physiological and ergonomic demands, inhibited mobility and specific body shapes. Moreover, there is a dearth of research on active sportswear for consumers living with physical disabilities in Afrika because the focus of fashion design actors: educators, practitioners and the sportswear industry in their studies, apparel collections or lines and products respectively is predominantly skewed toward the temporarily able-bodied, young, middle-aged and middle to high-class fashion-conscious consumers. The skewedness occurs despite the fact that sports inspire fashion. Further, no attempt has been made to co-design intelligent adaptive active sportswear, more so for an underserved, under-identified, invisible and marginalized consumer group of JSLWPDs. This is the first study in Afrika to address JSLWPDs' [dis]satisfaction level with selected active sportswear attributes, whose implication is the enhancement of the end-users' social inclusion.

1.2 Objective and Hypothesis

This study explores JSLWPDs' [dis]satisfaction level with selected active sportswear attributes in Kenya. The active sportswear attributes were limited to clothing only and comprised form, function, aesthetics and experience. The study hypothesised an association existed between selected active sportswear attributes and [dis] satisfaction level of JSLWPDs.

2 Literature Review

2.1 Physical Disabilities and Participation in Competitive Sports

The proportion of PLWDs is slightly higher in rural than in urban areas accounting for 2.6% and 1.4%, respectively. The common types of disability include mobility (385,417), visual (333,520) and albinism (9.729) [15] as well as hearing impaired and mentally handicapped [35] mainly caused by diseases especially polio, congenital disorders and accidents [26]. The age bracket of adolescent and youth living with disabilities is on the increase due to the current lifestyle and the difficult unchanging economic conditions [28], an indication of the continuous existence of disability conditions in the country. Simmons [36] opines that this special group lives as an invisible minority. However, their highly developed alternative senses and training in daily living skills, mobility, use of aids and appliances and social skills among other concerns would help them to adjust to their disability and

perform at par with the able-bodied. The persons can grow up to lead contributing and satisfying lives in the community as adults. These individuals face numerous challenges such as lack of access to good quality education [36] and high school drop-out rate due to their disabilities, poverty, illness and lack of interest as well as the negative attitudes displayed by the people around them [26]. Other conundrums relate to lack of equal opportunities, barriers of the physical environment [3], diseases whereby PLWDs comprise 29% of all new HIV/AIDS infections in Kenya [10], unintended pregnancies, early marriages, unemployment [30], un-adaptive vocational training, lack of information in diverse formats and limited access to health care and suitable housing [11]. Gender disparity is significant at all levels of education with girls being more disadvantaged [15]. The result is PLWDs' unsustainable livelihoods caused by social, environmental, economic and cultural exclusion.

Physical disabilities affect the lower torso or lower limb [12]. The study was limited to physically handicapped adults aged 18–45 years focusing on their decision-making and fit of apparel and employed structured questionnaire and interview schedule. The research approach adopted lacks human-centred techniques: design sustainability, which is considered amenable to design-related studies.

Schlosser and Caroll [33] assert that athletes undergo bodily stresses brought on by the physical demands of competition and performance posing potential physical risks. In the sporting environment, athletes even with a disability push their bodies to the limit to meet the physical demands of the competition and to avoid injuries. Hence, there is often a high risk of overexertion. Active sportswear attributes essentially for JSLWPDs should address not only their special apparel needs but bodily stresses occasioned by the physical demands of participation in sports and prevent injuries. The effort would contribute to their social inclusion.

2.2 Active Sportswear Attributes

Active sportswear is hereby discussed in relation to the types, styles, functions and acquisition. Types of active sportswear are body enclosures which refer to the envelopment and covering of the body or some parts of the body. The items may be pre-shaped to fit a part of the body, wrapped around the body, suspended from a part of the body or combinations thereof [14]. Examples include tracksuits, breathable tops, warm-ups, shorts, socks and shoes [1] as well as sports bras, singlets, tights (long or short), dresses and tee-shirts, gloves, and headbands among others.

Schlosser and Caroll [33] posit that specialised apparel can be designed to perform two important tasks for athletes: monitoring and enhancement. Compression apparel is traditionally used to enhance athletic performance by providing muscle support and stability throughout training and competition. Proper fit of the specialised apparel designed to meet the demands of individual sports is

especially important in product development. For instance, athletics (track and field) require form-fitted/loose sportswear. Physiological performance benefits to the wearer are attributed to contact pressure in the garment provided by fit and fabrication [33].

Style is the visual appearance, which includes line, silhouette, colour and details which affect consumers' perception towards the garment [17]. The type of neckline and placement of closures/openings is of the utmost importance in athletic apparel. Athletes with a disability can experience loss of dexterity or poorly functioning joints and muscles, therefore product development of their apparel must be mindful of the position of closures and seams; ease of wear as well as the comfort and selection of fabrics used to adhere to specific body types. Design aesthetics of mainstream fashion help to promote the athletes' self-body image [33]. Imbuki [12] concluded that assistive devices used by PLWDs such as crutches, wheelchairs and callipers determine the kind of features to be attached to clothes, their positions and the fabric used to design/produce the clothes. The study's adult consumers were dissatisfied with clothing styles in the market and are willing to pay more for apparel specially-designed to improve their appearance positively. Some sportswear styles include sports tee-shirts with raglan sleeves and crewneck or V-neck, fabrics comprise polyester, nylon, elastane, cotton and blends as well as pockets, graphics, Afrikan prints and the colours of a nation's flag.

Athletes with a disability have specific functional needs that could be met through the development of specialised garments based on physiological and ergonomic demands [33]. Athletes' functional needs include mobility, cushioning, support, coverage, comfort, visibility, warmth, durability, traction, enhanced performance and identity. Comfort relates to keeping the wearer cool and dry when in action. Comfort is also related to the type of fabric, sportswear item's weight and fit (sportswear size). According to Kinuthia et al. [17], 95% of the respondents indicated that sportswear size influences their brand loyalty because it provides comfort during swimming. All apparel items are selected based on their fitting qualities (the relationship between the apparel and the body size) and the swimwear is no exception. Imbuki [12] study findings, notably, adult PLWDs' dissatisfaction with apparel fit presented an opportunity for the adoption of design sustainability more so adaptive apparel for the consumers. However, the chance was never exploited. Hence, the consumers' special apparel needs and social inclusion remain unmet.

Visibility, provided by reflective details such as a logo or a strip of fabric enables the wearer to be seen even in darkness. Mobility refers to freedom and naturalness of movement. For instance, a singlet (worn as outerwear) made of polyester/elastane blend of single jersey for stretch purposes and raglan sleeves on tee-shirts. The mobility of JSLWPDs is inhibited, thus adaptive active sportswear should be designed to counter the challenge. Warmth is provided by the type of fabric and technology used to manufacture sportswear. Cushioning protects from hard and rough surfaces in addition to injuries. Support refers to stabilizing the muscles as well as securing sportswear in place during moderate to intense physical activities. Sports bras are the most important sportswear for female athletes to protect their breasts from sports injuries.

Durability is offered by the quality of workmanship and materials used to produce active sportswear. Durability/longevity, be it emotional, physical or stylistic extends the use of apparel [2] thus promoting sustainability. Coverage refers to the enclosure which is offered by sports bras, tracksuits, vests and wrap-around skirts. For the JSLWPDs, coverage also relates to the concealment of assistive devices as well as their disabilities. Coverage may also concern modesty/immodesty in that the sportswear item conceals parts of the body to various extents. Therefore, a tee-shirt conceals the wearer from the neck to the hips, whereas a short sports bra covers the bust leaving the midriff and hands exposed.

Hassan et al. [9] established that sportswear made of 100% polyester fabric produced the best physiological responses and performance from the athletes compared to 100% cotton and 65/35 polyester/cotton blend. Despite the positive results of the former, sustainable fashion advocates for the use of environmentally-friendly end-of-life (EOL) fibres and fabrics such as bamboo and organic cotton among others.

From sustainability viewpoint, branding should utilize embroidery rather than printing unless eco-printing pastes are used. From the customer's perspective a brand can signify product quality, allows one to shop with confidence and have some expectations. In Kenya, Speedo is the most preferred brand among university students' swimmers [17]. Green active sportswear consumers would buy from brands that promote sustainability.

Sportspersons, including JSLWPDs, may acquire active sportswear from corporates, fellow sportspersons, charitable organisations or the government. Young female runners in Kenya acquire used shoes during the Shoe4Africa races in Kenya. Shoe4Africa is a charitable organisation founded by Lorna Kiplagat and Toby Tanser. The initiative is sustainable because rather than dispose of the shoes into landfills they are re-used. Apfeld [1] articulates that lack of training shoes is a great obstacle that forces the runners to wear shoes for over 1000 miles well above the 300 miles guidelines for the life of a running shoe. The Government of Kenya kits all the national teams that represent the country in international athletics competitions, including Paralympic Games.

2.3 A Spotlight on Sustainability Elements Applicable to Active Sportswear Product Development

Sustainability implies a model comprising several elements: social, consumer, design, economic, environmental, innovation, technological, business models, marketing, raw materials, transparency [5] as well as cultural [43], which are dynamic and interact with one another, each factor being influenced by the others. Sustainability also implies a multi-disciplinary approach integrating the short-term into the long-term [5]. Research on the slow fashion movement or sustainable fashion has gained momentum globally with increasing concerns about sustainability.

Consumer sustainability entails information access, care of clothes purchased and consumer's responsibility in their purchase decisions [5] which reflects a goal of the slow fashion movement in that clothing is enjoyed and savoured for an extended period [2]. Majority of PLWDs in Kenya are unaware of distributors of specialised/adaptive apparel, though they are willing to pay a premium price for fashionable functional apparel if available [12]. The PLWDs' willingness offers an opportunity for fashion designers to co-create apparel with the marginalized consumers that meet their special needs thereby foster sustainability and social inclusion. Customer-experience-driven strategies such as co-creation, customisation, emotional value and experience design lead to attachment to the product. Consumption-driven sustainable strategies include high-quality material and finishing, durability/"longevity" (provide extended garment lifetime) and timeless/classic/slow design [41]. Casto and DeLong [2] outline three types of durability: emotional, physical and stylistic which lead to sustainability/extended use. Gwilt and James [7] in terms of "longevity" posit that WRAP's "Love Your Clothes" campaign provides resource advice on garment care and repair, remanufacturing methods and recycling/reuse ideas. The campaign also educates consumers in making better purchasing choices by highlighting the durable attributes that are typically found in different apparel types. Active sportswear for JSLWPDs with care labels attached to them shall enhance durability through appropriate care thus sustainable.

Regarding environmental sustainability Casto and DeLong [2], highlight males' and females' concept of classic involved a sophisticated style that related to current trends with slavish adherence to current fashion or any specific period that could help to extend their wearing of apparel and slow fashion in the future. Thus, classic apparel such as an outerwear coat is not readily discarded to the landfill.

Design sustainability classifies designers as a determiner (creator of boundary objects), condition creator (creator of learning objects) and co-creator (facilitator) and they should design items that people need and not those that people want [5] hence meet the needs of consumers as well as the need for sustainability [2]. On 3rd September 2020 Adidas, the German sportswear company released its *Adizero Adios Pro* running shoe that was co-created with elite Kenyan and Ethiopian athletes [21]. Two Kenyans, Peres Jepchirchir and Kibiwott Kandie went on to win their races in the 'Prague Restart' Project wearing the freshly-launched shoe [22]. The win could partly be attributed to the shoe.

Innovation sustainability is disruption that requires brands or companies to "think very differently" [5]. Morgan et al. [24] demonstrate the potential for innovation across all of Stevels' four levels of sustainable innovation based on five principles of sustainability for textile design. The authors express industrial partners' outlook that the ability to add customised, direct-to-garment features as advantageous benefits of the laser textile techniques for sportswear. Jonk [13] highlights that Egyptian fashion designer Chant Avedissian moved the traditional to the contemporary in a sustainable way by interpreting specific Egyptian textile traditions through a series of clothing and textiles namely the Nubian *Girgar* and Bedouin Flat weave: colour theories, traditional pattern-cutting techniques, usage of

shape and textures and finishing. Palestinian designer Faisal El Malak's work embodies sustainability as his contemporary men's and women's wear incorporate traditionally hand-woven fabrics around the United Arab Emirates. Thus, the designers are creating clothing with meaning, consequently changing production techniques and influencing consumption and post-consumption attitudes: sustainability. The study sought to establish the JSLWPDs' opinion about the aesthetic appeal of active sportswear considering that they are young and fashion-conscious with special apparel needs.

Technological sustainability entails the process-related and product-related issues [5]. Wong and Leong [41] observe that sustainable production-driven strategies comprise sourcing, technology, up-cycling, recycling and reusing. Sustainable products stress on product quality and safety and promote the use of eco-materials, to include organic cotton, natural cellulose and natural-dyed fibres. Morgan et al. [24] state that advances in textile design and technology underpin innovation in fashion. The reason is partly that textiles are the fabric of fashion, and also the natural intersection of design and science that occurs through textile practice. The advantages of laser textile techniques are engagement with the customer in a transparent process, reduce over-supply and subsequent waste. Moreover, the double-sided colouration of fabric is ideal for producing reversible apparel: a sustainable product. The JSLWPDs would greatly benefit from reversible sportswear. Gwilt and James [7] point out factors that need to be considered when designing apparel and services for longevity. The factors are design aesthetics; size and fit; providing greater durability/"longevity" as a valuable clothing attribute and reposition "disposable" garments as undesirable. The seniors/elderly consumers have relatively similar special apparel needs to PLWDs, including, the JSPLWDs. Rousseau [32] and Starkey and Parsons [37] reveal that the assortment of clothing/apparel design solutions and footwear items for seniors/elderly consumers is insufficient in the retail industry because it is a market that is often neglected by both the apparel products industry and design educators. The fashion actors ignored their needs for fashionable, functional, comfortable and conservative apparel that addresses their specific changes in ability (especially physical abilities), attitudes and lifestyle due to their focus on the young/middle-aged clients. However, Rousseau [32] asserts that some elderly respondents mentioned "speciality stores", catering for mature customers but they were generally expensive and that elegant styles were available if one were willing to search around. According to Starkey and Parsons [37] apparel design categories pertaining directly to clothing preferences were identified as style, colour and print, fit and adjustability, comfort, fabric, ease of wear and versatility. There was a preference for printed garments to accent areas of their outfits and to liven up a neutral-coloured ensemble. Adjustability allows for a somewhat customised fit. Garments that are not too tight are preferred hence most of the prototypes were designed to be body skimming-fitted. Concerning comfort, fabric and ease of wear, the fabrics chosen were soft to the touch and included linen, cotton, cotton/rayon/spandex and cotton/polyester/rayon knits and silk organza and incorporated stretch. Pocket placement on corresponding garments avoided the creation of bulk. Due to dexterity limitations, the garments were predominantly

designed to be pulled on. Versatility is achievable through a capsule wardrobe to make dressing more manageable. The mini-collection thus comprised versatile and interchangeable pieces that colour coordinate [37].

Social sustainability relates to social inclusion, modelling, labour rights, human rights, human trafficking, anti-corruption and knowing and understanding the fast fashion [5]. Social inclusion of JSLWPDs may be promoted through apparel as well as other factors. du Preez et al. [4] assert that the population of older consumers is growing significantly in South Africa as well. Although they have been labelled as vulnerable consumers with less financial freedom, they have become an important, often overlooked market segment with the likelihood of increasingly more buying power. Changes that occur with ageing specifically body features (shape and fragile skin) and preferences lead to changes in their evaluation of clothing quality, which clothing manufacturers disregard. The elderly consumers were dissatisfied with current clothing quality (negative disconfirmation), especially in terms of the attributes of price, correct sizing, and fabric, which attracted the lowest performance ratings. Ill-fitting garments may be uncomfortable to wear, which may influence the comfort of clothing, thus confirming the importance of fabric, style and fit [4]. Wong and Leong [41] state that corporate social responsibility (CSR) practices adopted by all the Hong Kong and China-based manufacturers and retailers are ostensibly "half-hearted" and have engaged less with sustainability on the consumption side but have instead boosted consumption via seasonal sales, free gifts, and buy-one get one-free online campaigns.

Other than fibres, yarns, fabrics, dyes and printing pastes, raw materials sustainability includes issues related to water, energy and soil [5]. Gopura and Payne [6] state that House of Lonali, a sustainable brand in Sri Lanka uses the export business industry's textile waste as the basis of design, that is, up-cycling discarded fabrics and trims. Her collections cleverly transform the odd-shaped offcuts into fresh and youthful designs with intriguing panelling and drape as well as appliqué styles and shoes. Youthful designs incorporated in the active sportswear for JSPLWDs would enhance their social inclusion.

Regarding cultural sustainability involves explicitly empowering and recognising artisans' traditional skills and knowledge in any collaboration/project [43] such as textile heritage with designers. Wong and Leong [41] highlight culturally-driven strategies like tradition preservation and embedding cultural elements. The Fabrick Lab started 'UN/FOLD' to work with the Shui ethnic minority to employ batik textile techniques to make scarves, thus preserve traditional handicrafts and subsidise their livelihoods. This study addresses the JSPLWDs' perspectives on incorporating culturally-inspired prints in their active sportswear that would help identify with their different cultures.

Based on the discourse on sustainability and sustainable fashion, it is clear that globally fashion actors: fashion educators', practitioners' and industry's studies, apparel and accessories collections and products, respectively are predominantly skewed toward production and consumption of fashion, targeting young, middle-aged and middle-high class fashion-conscious temporarily able-bodied end-users. The actors neglect and overlook a relatively large market segment of

end-users living with disabilities and special apparel needs, specifically JSLWPDs. In addition, the co-design and production of adaptive active sportswear remain largely ignored by the fashion actors. In the limited fashion establishments, which cater to persons with special apparel needs more so the elderly consumers the merchandize assortment is generally costly and out of reach to many end-users.

3 Research Methodology

The study adopted a case study and mixed-method research design: descriptive survey and ethnography. The reason is that case studies are usually qualitative in nature and aim to provide an in-depth description of a small number of cases while surveys are quantitative in nature whose objective is to afford a broad overview of a representative sample of a large population [25]. The study was conducted in Masaku School for the Physically Challenged, a primary school in Machakos County, Kenya. The population comprised 60 JSLWPDs who engage in diverse competitive indoor and outdoor sports. Judgement sampling was employed to select 12 games captains: one for each competitive sport and who according to the sports teacher would ably fill the questionnaire. The games captains (respondents), one sports teacher (male, holds a diploma in Special Needs Education (SNE) with five years of coaching experience) and the Association of Persons with Physical Disabilities (APDK) Machakos County Coordinator (female, holds a diploma in occupational therapy and has served in the position for four years) filled semi-structured questionnaires. Two focus group discussions (FGDs) were held, one with six girls and another with seven boys. The data collection also entailed artefact analysis (active sportswear worn by the JSLWPDs) and fieldwork photography. The approach resulted in technique and data triangulation which provided a basis for checking and rechecking interpretations and revealed 'the whole picture' of the phenomenon. The data analysis comprised descriptive and inferential statistical techniques and thematic and qualitative content analyses. Consent to conduct the study was granted by the school's head teacher (refer to Appendix I).

4 Results

4.1 Demographic Characteristics

The results from the questionnaire reveal the female and male JSLWPDs totalled 5 (42%) and 7 (58%), respectively, aged between 12 and 20 years. The majority 9 (75%) were 13–16 years old, except a 20-year-old girl who could have started schooling very late in life. The respondents are between class/grade 5 and 8,

whereby one-half (50%) are in class/grade 8 who are due to write the primary school level final national examinations.

The most used assistive device is the manual wheelchair 4 (34%), in addition to crutches, prosthetic legs and callipers 1 (8%) each. Notably, 5 (42%) do not use any assistive device due to the nature of their disabilities which include dowager's hump, cerebral palsy and club foot. The sports teacher affirmed that crutches and wheelchairs are the most frequently used assistive devices and lower limb weaknesses and cerebral palsy are the most widespread physical disabilities among the JSLWPDs. The occupational therapist also alluded that wheelchairs are the most unexceptional assistive devices used by the JSLWPDs and the most widespread physical disabilities are lower limb weaknesses.

The JSLWPDs have been participating in both indoor and outdoor competitive sports for between 2 and 7 years. Specifically, 5 (42%) have five years' experience and the exceptional case of seven years' experience who plays scrabble started competing at the tender age of nine years.

Some of the JSLWPDs participate in more than one sport. It is evident from Table 1 that chess is the most preferred indoor sport. Other than the JSLWPDs being talented in chess, they like it because it is intellectually-engaging. Football is preferred because it is enjoyable, likeable and challenging. Para-volleyball players similarly are talented in the sport. Netball players consider the sport as the easiest to play, enjoyable and it strengthens them. Scrabble is preferred because it is intellectually-engaging and the JSLWPD is proficient in the English language. Wheelchair racers enjoy the game and are talented in it. The girls' FDG corroborates the finding in that they participate in competitive sports because they are talented, like the specific sport and it makes one strong. The boys vocalised in their FGD that they get to travel to different parts of the country namely Kisumu, Nyeri, Meru, Nakuru and Kakamega among others, sport can be pursued as a career, for adventure, exercise and fun, get to interact with counterparts from other schools, learn and have the ability to participate in a specific sport such as wheelchair racing. Competitive sports occasion physical and mental demands on the sportspersons. From the girls' FGD, netball players' hands must be strong to hold the ball well and be fit to run. Para-volleyball requires firm hand muscles to hit and block the ball in addition to proper sitting positions. Both chess and scrabble are mental thus the players exercise their minds. The boys' FGD added that wheelchair racers must have strong hand muscles and bend appropriately to move the manually-operated wheelchairs. Footballers both CP and PH must be attentive to the whereabouts of the ball and be fit to run. Handball requires strong hand muscles to bounce the ball.

The questionnaire and FGDs findings reveal that the JSLWPDs who participate in competitive chess and scrabble do not sustain any injuries. However, outdoor sports players are prone to various injuries. Common injuries associated with football for CP and PH and handball include bruised limbs caused by falls or knocking stones when running, painful collision with other players and slippery ground during the rainy season. Wheelchair racing injuries include fingers being hurt by the wheels of manually-operated wheelchairs, muscle pull and the wheelchair may overturn, thus hurt the player. For para-volleyball players broken fingers

Table 1 JSLWPDs by competitive sports they participate in

Sport	n	%
Chess	3	25
Football for cerebral palsy (CP) and physically handicapped (PH)	2	17
Para-volleyball	2	17
Netball	2	17
Scrabble	1	8
Wheelchair racing	1	8
Handball	1	8

are a common injury due to the impact of the ball, the surface may be rough thus hurt the buttocks and being hit by the ball on any part of the body. The game is played with the players seated on the ground. Netballers also experience broken fingers, painful collisions with other players and bruised limbs emanating from falls. The sports teacher confirmed that fractures and dislocation of joints as well as bruises among wheelchair racers are common injuries associated with participating in sports. The occupational therapist asserted that soft tissue injuries and fractures from falls are common injuries among the JSLWPDs.

4.2 Active Sportswear for JSLWDs

Sportspersons can acquire active sportswear from diverse sources and the JSLWPDs are no exception.

Table 2 depicts all (100%) respondents acquire active sportswear from the school, in addition to (50%) each who buy for themselves or receive donations from charitable organisations. Notably, no sportswear manufacturer donates active sportswear despite the Kenyan market hosting several local and international producers. The sports teacher also asserted that the school procures active sportswear for the JSLWPDs and receives donations from charitable organisations. Further, the occupational therapist reported that the school procures, the JSLWPDs buy for themselves and charitable organisations donate active sportswear.

Table 2 JSLWPDs by acquisition of active sportswear

Acquisition	n	%
The school provides	12	100
Philanthropists donate	0	0
Sportswear manufacturers donate	0	0
I buy for myself	6	50
Charitable organisations donate	6	50
Coaches provide	1	8

Multiple responses allowed

Slightly over one-half (58%) and (42%) of the JSLWPDs are consulted and not consulted, respectively on their preferences for active sportswear. The former comes about when the JSLWPDs' anthropometric measurements are taken by a tailor who is sometimes engaged by the school to produce some active sportswear items. The sports teacher affirmed that the JSLWPDs are not consulted on their active sportswear preferences while the occupational therapist reported the contrary.

The girls stated in the FGD that the active sportswear items issued have a poor fit, are torn and the fabric colour (green) shows dirt easily thus require thorough cleaning which they are sometimes unable to do due to their disabilities. The boys in a FGD opined that the active sportswear poses challenges due to tight elasticized track trouser waistband, sleeveless vests expose their disabilities, non-absorbent fabric, heavy items of wear and a poor fit.

Fieldwork photography and artefact analysis revealed the active sportswear items include tracksuits (jacket and trouser), pair of shorts, wrap-around skirts and vests. The track jacket is made of green 100% polyester heavy-weight knit/jersey fabric. Other attributes include a centre front heavy-duty separating zipper, stand collar, raglan sleeves with elastic hems and two white strips of fabric along the length of the sleeves, elasticized hem, school's name and logo printed on both back and front and shallow side seam pockets (Figs. 1, 2, 3, 4). The track trouser features elastic and drawstring on the waistband, elasticized hems and zipper opening on the inside leg seams, deep side seam pockets and green 100% polyester heavy-weight knit/jersey fabric (Figs. 5, 6, 7). The green wrap-around skirt has a white binding along the edges and is of 100% polyester lightweight knit/jersey fabric (Fig. 8). Green 100% polyester lightweight knit fabric is used to produce sleeveless vests which have a white binding around the armholes and neckline, and the school's name is printed in front and at the back (Fig. 9). The pair of shorts is made from green 100% polyester lightweight knit fabric and has a white strip of fabric sewn along the side seams (Fig. 10).

4.3 [Dis]Satisfaction Level with Selected Active Sportswear Attributes

The JSLWPDs' perceptions on the [dis]satisfaction level with the listed active sportswear attributes were solicited using a four Likert-scale: Highly Dissatisfied (HD), Dissatisfied (D), Satisfied (S) or Highly Satisfied (HS).

The results of Table 3 illustrate the JSLWPDs' high dissatisfaction levels with the following active sportswear attributes: function/usability (75%), size ranges (50%), culturally-inspired fabrics prints (50%), versatility (50%) as well as school logo printed on track jacket (58%) though artefact analysis shows the track jackets and vests are branded with the school's name and logo both at the front and back. The JSLWPDs' dissatisfaction level is caused by fit (67%), the weight of sportswear items (59%), freedom of movement (67%), aesthetically pleasing colours

Fig. 1 JSLWPD plays chess and scrabble

(50%), absorbent fabric (50%), track jacket sleeves are wide thus allow mobility (67%) and pockets attached (50%). However, the JSLWPDs are satisfied with various active sportswear attributes namely coverage of assistive devices (42%), endow school's identity (50%), provide support to body parts (50%), care labels attached (50%), easy to manipulate openings and fastenings (50%), easily reachable openings and fastenings (67%) and the necklines (50%). Among the active sportswear attributes that the JSLWPDs are highly satisfied with comprise reputable Kenyan brand names (58%), waistline finishes (58%) and track trouser hems are wide enough thus ease wear (50%).

The sports teacher highlighted satisfaction with various active sportswear attributes to include coverage of assistive devices, the weight of the clothing, enhancement of performance and adjustability. However, dissatisfaction was attributed to lack of the school logo on track jackets, culturally-inspired fabric prints, stretch fabric and the pockets attached. The occupational therapist's dissatisfaction with the active sportswear arose from lack of the school's identification,

Fig. 2 Wheelchair racing mixed

Fig. 3 Wheelchair racing boys

Fig. 4 JSLWPD plays netball

Fig. 5 Boys participating in para-volleyball

Fig. 6 Girls participating in para-volleyball

Fig. 7 From left to right JSLWPDs plays scrabble and chess

aesthetically pleasing colours, care labels attached, reputable Kenyan brands and the width of track trouser hems. Further, the respondent's general satisfaction was with function, fit, size ranges, coverage of assistive devices, thermal insulation,

Fig. 8 JSLWPDs plays chess

smooth fabric texture, stretch fabric, adjustability, versatility, logo printed on track jacket, high-quality workmanship, wide track jacket sleeves, neckline, pockets attached and well-set collars.

4.4 Chi-Square Test for Independence Results for [Dis] Satisfaction Level of Selected Active Sportswear Attributes

The results in Table 3 were further analysed using Chi-square test for independence at ($p \leq 0.05$) alpha level to explain whether or not the attributes are associated and judge the significance of such association or relationship [19]. The eight active sportswear attributes selected were deemed amenable to sustainability and the design of adaptive/specialised apparel for special-needs persons namely PLWDs

Fig. 9 Boys participating in handball

Fig. 10 Boys engaging in cerebral palsy football

Table 3 JSLWPD by [dis]satisfaction level of selected active sportswear attributes

Active sportswear attribute	HD	D	S	HS	No
responseTotaln%n%n%n%n%(i) Function/usability97521718——12100(ii) Fit18867—2171812100(iii) Size ranges650217217—21612100(iv) Coverage of assistive devices217—5421331812100(v) Weight of sportswear items18759217181812100(vi) Provide cushioning3253252173251812100(vii) Affords visibility325542—433—12100(viii) Offer sportsperson's identity32543343319—12100(ix) Endows school's identity/name217217650216—12100(x) Enhance performance19325433433—12100(xi) Provide support to body parts21718650325—12100(xxi) Offer freedom of movement1886721718—12100(xiii) Reversible track jacket433433434——12100(xiv) Fabric affords thermal insulation542433—325—12100(xv) Smooth fabric texture325433325217—12100(xvi) Stretch fabric325542433——12100(xvii) Culturally-inspired fabric prints650325325——12100(xviii) Aesthetically pleasing colours18650217325—12100(xix) Adjustability433—1854221712100(xx) Versatility6501818434—12100(xxi) Trimmings add aesthetic19325433433—12100(xxii) Logo printed on track jacket75818217217—12100(xxiii) Care labels attached217216650217—12100(xxiv) Absorbent fabric217650433——12100(xxv) High-quality workmanship43321718542—12100(xxvi) Reputable Kenyan brand names, "Made in Kenya"325217—758—12100(xxvii) Easy to manipulate openings and fastenings18325650217—12100(xxviii) Easily reachable openings and fastenings433—867——12100(xxix) Width of track jacket sleeves allows mobility1886721718—12100(xxx) Necklines43318650—1912100(xxxi) Waistline finishes—325187581812100(xxxii) Pockets attached—6503252171812100(xxxiii) Track trouser hems are wide enough thus ease wear217217186501812100(xxxiv) Properly-set collars21743221721721712100(xxxv) Generally affords ease of and independence in wear217—32543332512100					

and the elderly as articulated in studies by Starkey and Parsons [37], Schlosser and Caroll [33] and Imbuki [12].

It is evident from Table 4 that there is a significant difference in the dis[satisfaction] level among the selected active sportswear attributes. The JSLWPDs express high dissatisfaction level with active sportswear. The *Ho* hypothesis is therefore rejected.

4.5 *Gender Perspective on [Dis]Satisfaction Level of Selected Active Sportswear Attributes*

Further probing was conducted on the discoveries in Table 3 to uncover the gender perspectives of the JSLWPDs' [dis]satisfaction level with selected active sportswear attributes. This is because female athletes faced barriers, especially sportswear [34], they have a high involvement with fashion [29] and generally most fashion studies focus on the female and disregard the male perspective. The attributes were also deemed amenable to sustainability and design of specialised apparel as stressed upon by researchers *inter alia* Starkey and Parsons [37], Schlosser and Caroll [33] and Imbuki [12]. A four Likert-scale: Highly Dissatisfied (HD), Dissatisfied (D), Satisfied (S) or Highly Satisfied (HS) was adopted.

Table 4 Chi-square test for independence results for [dis]satisfaction level of selected active sportswear attributes

Active sportswear attribute	HD	D	S	HS	No response	Total
(i) Function/ usability	75 (27%)	17 (34.6%)	8 (25.1%)	0 (8.3%)	0 (5%)	100
(ii) Fit	8 (27%)	67 (34.6%)	0 (25.1%)	17 8.3%)	8 (5%)	100
(iii) Size ranges	50 (27%)	17 (34.6%)	17 (25.1%)	0 (8.3%)	16 (5%)	100
(iv) Coverage of assistive devices	17 (27%)	0 (34.6%)	42 (25.1%)	33 (8.3%)	8 (5%)	100
(v) Weight of sportswear items	8 (27%)	59 (34.6%)	17 (25.1%)	8 (8.3%)	8 (5%)	100
(vi) Offer freedom of movement	8 (27%)	67 (34.6%)	17 (25.1%)	8 (8.3%)	0 (5%)	100
(vii) Absorbent fabric	17 (27%)	50 (34.6%)	33 (25.1%)	0 (8.3%)	0 (5%)	100
(viii) Easily reachable openings and fastenings	33 (27%)	0 (34.6%)	67 (25.1%)	0 (8.3%)	0 (5%)	100

$\chi^2 = 357.6$, d$f = 28$, $p = 41.337$, $n = 800$

Taking levels above 50% and the higher of the genders' percentage level, a notable observation in Table 5 is that dissatisfaction level of both genders is equal (31%) concerning eight active sportswear attributes: function/usability, fit, size ranges, weight of sportswear items, offer freedom of movement, versatility, absorbent fabric and width of track jacket sleeves allows mobility. On the other hand, the satisfaction levels of the males (31%) surpass the females' (7%) in five attributes: coverage of assistive devices, care labels attached, easy to manipulate openings and fastenings and easily reachable openings and fastenings.

Table 5 Gender perspective of JSLWPDs on [dis]satisfaction level of selected active sportswear attributes

Active sportswear attribute	Gender	HD		D		S		HS		NR		Total	
		n	%	n	%	n	%	n	%	n	%	n	%
(i) Function/usability	Female	6	86	–	–	1	14	–	–	–	–	7	100
	Male	3	60	2	40	–	–	–	–	–	–	5	100
(ii) Fit	Female	–	–	5	72	–	–	1	14	1	14	7	100
	Male	1	20	3	60	–	–	1	20	–	–	5	100
(iii) Size ranges	Female	4	58	–	–	2	28	–	–	1	14	7	100
	Male	2	40	2	40	1	20	–	–	–	–	5	100
(iv) Coverage of assistive devices	Female	–	–	1	14	1	14	4	58	1	14	7	100
	Male	2	40	–	–	3	60	–	–	–	–	5	100
(v) Weight of sportswear items	Female	1	14	3	44	1	14	1	14	1	14	7	100
	Male	–	–	4	80	1	20	–	–	–	–	5	100
(vi) Offer freedom of movement	Female	1	14	4	58	1	14	1	14	–	–	7	100
	Male	–	–	4	80	1	20	–	–	–	–	5	100
(vii) Versatility	Female	2	28	1	14	1	14	3	44	–	–	7	100
	Male	4	80	–	–	–	–	1	20	–	–	5	100
(viii) Care labels attached	Female	1	14	1	14	3	43	2	29	–	–	7	100
	Male	1	20	1	20	1	60	–	–	–	–	5	100
(ix) Absorbent fabric	Female	1	14	3	43	3	43	–	–	–	–	7	100
	Male	1	20	3	60	1	20	–	–	–	–	5	100
(x) Easy to manipulate openings and fastenings	Female	1	13	2	29	2	29	2	29	–	–	7	100
	Male	–	–	1	20	1	80	–	–	–	–	5	100
(xi) Easily reachable openings and fastenings	Female	3	43	–	–	4	57	–	–	–	–	7	100
	Male	1	20	–	–	4	80	–	–	–	–	5	100
(xii) Width of track jacket sleeves allows mobility	Female	1	14	5	72	1	14	–	–	–	–	7	100
	Male	–	–	3	60	1	20	1	20	–	–	5	100
(xiii) Track trouser hems are wide enough to ease wear	Female	2	29	–	–	1	14	4	57	–	–	7	100
	Male	–	–	2	40	–	–	2	40	1	20	5	100

4.6 Proposed Design Details to Counter JSLWPDs' Dissatisfaction with Selected Active Sportswear Attributes

The questionnaire also sought to unravel active sportswear attributes that the JSLWPDs would like to be improved. The respondents recommended the following design details: attach deep pockets in track jackets, replace sleeveless vests with long-sleeved tee-shirts to camouflage their disabilities but without any elastic to allow free blood circulation, provide correct sizes, change the colour from green to blue and identify the sport on the track jacket. In addition, the JSLWPDs desire to

be provided with more active sportswear items so that each player has a set, as well as sports shoes and socks. In the FGDs the boys proposed that the sportspersons' anthropometric measurements be taken to provide the correct fit, medium-weight fabric used to manufacture active sportswear and gloves for goalkeepers while the girls advocated for identification of the sport on the track jacket. On the other hand, the sports teacher proposed adjustability, size ranges and cushioning. The pants hems can be widened, brand the active sportswear with the school's name and logo for identification and use absorbent and knit/jersey fabric to produce all the items as suggested by the occupational therapist.

5 Discussion

Persons living with disabilities (PLWDs) of all ages are an under-served, under-identified and a marginalized consumer group. The JSLWPDs voluntarily participate in diverse indoor and outdoor competitive sports for reasons such as enjoyment, challenge, talent, adventure and learning experience, leading to their social inclusion. The reasons for participating in sports concurs with Wanderi [40] and Bukala (Personal Communication 2015), thus facilitates the attainment of social sustainability. Globally fashion actors: educators, practitioners and the sportswear industry have neglected this special group of end-users, hence inhibiting the latter's social inclusion. Consequently, the extant active sportswear donned by JSLWPDs disregards the principles and ethos of sustainability *inter alia* the consumer, environmental, design, innovation, technological, social, raw materials and cultural. The ignorance has resulted in the JSLWPDs' high dissatisfaction level with numerous active sportswear attributes and further inhibits their full engagement and enjoyment of sport and social inclusion.

The JSLWPDs compete and perform exceptionally well in the annual Special Needs Education sports held countrywide in both indoor and outdoor categories namely chess, scrabble, football for CP and PH, netball, wheelchair racing and para-volleyball. Manually-operated wheelchairs are the most used assistive devices by the JSLWPDs due to the prevalence of lower limb weaknesses. Depending on the sport, it may have physical or mental demands and may occasion injuries- especially outdoor sports, to the sportsperson. However, the injuries can be reduced by the development of intelligent adaptive active sportswear, for instance, with cushioning.

The school is the major provider of ready-to-wear active sportswear which it procures from sportswear retailers. Though it occasionally gets the active sportswear tailored, it does not adopt co-creation with the JSLWPDs, resulting in poor fit and incorrect size among other conundrums. Due to scarce, worn out and ill-fitting active sportswear provided by the school, the JSLWPDs sometimes buy their own to look presentable and feel comfortable. Nevertheless, 58% of the JSLWPDs reported being consulted on their preferences for active sportswear though the results reveal that their dissatisfaction level is higher than the satisfaction level regarding numerous active sportswear attributes. Dissatisfaction arises because of the active sportswear's poor

functionality, the dearth of varied size ranges, fabric lacks culturally-inspired prints, no versatility, the track jacket is not branded with the school's logo (however, artefact analysis revealed the contrary) and poor fit (either too big or small or too long or short). Moreover, the sportswear items are heavy (especially the tracksuit), inhibits freedom of movement due to poor fit, the colour-green- is not aesthetically pleasing and favour blue instead, 100% polyester fabric used is non-absorbent despite the fact that they sweat a lot due to the high amount of energy expended in mobility (using wheelchairs, callipers and crutches and limbs for CPs), track jacket sleeves deter mobility and the pockets are shallow thus items like handkerchiefs easily fall off. Starkey and Parsons [37] reported that respondents favoured printed garments as a way to liven up a neutral-coloured ensemble. The JSLWPDs active sportswear fabric is solid/neutral green but they favour culturally-inspired fabric prints. Dissatisfaction with size ranges echoes Kinuthia et al. [17] that sportswear size is very critical in that it provides comfort during swimming. Further, correct clothing sizing was one of the three attributes which older consumers felt that clothing quality fell short and that ill-fitting garments may be uncomfortable to wear [4]. The dissatisfaction with fit, colours, fabric absorbency and pockets echoes Starkey and Parsons [37] findings that the mini-collection designed for elderly consumers incorporated pockets but avoided the creation of bulk, natural fibres with stretch and adjustability which ensured a customized fit. The dissatisfaction with colour resonates with Schlosser and Caroll [33] assertion that the design aesthetics of mainstream fashion help to promote athletes' self-body image. Dissatisfaction with the non-absorbent fabric contradicts Hassan et al. [9] claim that sportswear made of 100% polyester fabric produced the best physiological responses and performance from the athletes compared to 100% cotton and 65/35 polyester/cotton blend.

However, the JSLWPDs are satisfied with the active sportswear because of branding especially the vest which is inscribed with the school's name and logo though they would prefer it replaced with a long-sleeved regular fit tee-shirt to camouflage their disabilities, provides support to body parts, care labels are attached thus easy to clean and easy to manipulate and reach openings and fastenings including closed and separating zippers (though zippers easily get spoilt) and elastic. Further, the vests' round necklines are wide enough to allow ease in wear, the clothing is produced by reputable Kenyan brands, the track trousers' elastic and drawstring waistbands ensure they are firmly secured in place and the hems are wide enough due to the zipper opening. Chi-square test revealed a significant difference in the dis[satisfaction] level among the attributes. Thus it behoves fashion actors to address the JSLWPDs special apparel needs. From a gender perspective the dissatisfaction level of both genders is at par and it is higher than the satisfaction level on 13 selected active sportswear attributes. However, the fact that girls and women are double disadvantaged: by gender and disability [23] is worsened by the female JSLWPDs' dissatisfaction (31%) and satisfaction (7%) levels with several selected active sportswear attributes, thereby exacerbating their social exclusion. The result is consistent with Schweinbenz [34] that female athletes faced barriers, more so concerning sportswear. The results are contrary to Osmud [29] that females have greater sensitivity to clothing cues than males.

6 Conclusion

This study has provided insights into JSLWPDs' [dis]satisfaction level with selected active sportswear attributes. The significantly high dissatisfaction level is primarily caused by fashion actors disregarding the special apparel needs of this marginalized invisible young fashion-conscious consumer group. The school as the major provider of active sportswear to the JSLWPDs may adopt co-creation, a design sustainability approach. The approach would not only produce active sportswear with the correct size and fit but it would incorporate the JSLWPDs' preferences and special apparel needs.

Although this study has afforded an overview of active sportswear donned by JSLWPDs, further work needs to be undertaken through collaborative multi-disciplinary (fashion, textile and special-needs actors) action research to inform the co-design/user-oriented product development of intelligent adaptive active sportswear that factors the JSLWPDs' disabilities, preferences that come with their disabilities, gender, attitudes, age, lifestyles and the assistive devices that they use as well as the physical, physiological and ergonomic demands of a specific sport. The outcome of the study could spill over to related sectors such as apparel and textile manufacturing, retail, place-branding and entrepreneurship. It is also envisaged to inspire designer clothes in SIF conforming to the global trend. Fashion actors need to attend to and enhance the active sportswear attributes that the JSLWPDs are dissatisfied and satisfied with respectively to foster diverse sustainability aspects. For instance, *inter alia* a dash of brightly coloured culturally-inspired Afrikan patterns and trimmings would enhance aesthetics. Ease of wear may be promoted by incorporating easy to reach and manipulate openings and fastenings. Comfort could be achieved by the use of end-of-life, medium weight, stretch/knit/jersey, thermally insulating fabrics as well as enriched adjustability for a customised fit, freedom of movement, correct fit for specific body shapes from a wide range of sizes, support of body parts for example, sports bras and coverage of assistive devices as well as reversible items and cushioning. Longevity may be attained by attaching comprehensible care labels, superior quality items, abrasion-resistant fabrics and enhanced functioning while compression apparel boosts performance. Above all the active sportswear should be affordable. Other than clothing the active sportswear co-designed should include accessories essential for preventing injuries during sporting activities such as gloves and helmets. The initiative shall help the JSLWPDs to realise their full potential not only academically but also within the entire bio-psychosocial continuum especially social inclusion and enhance their active engagement in and enjoyment of diverse sports.

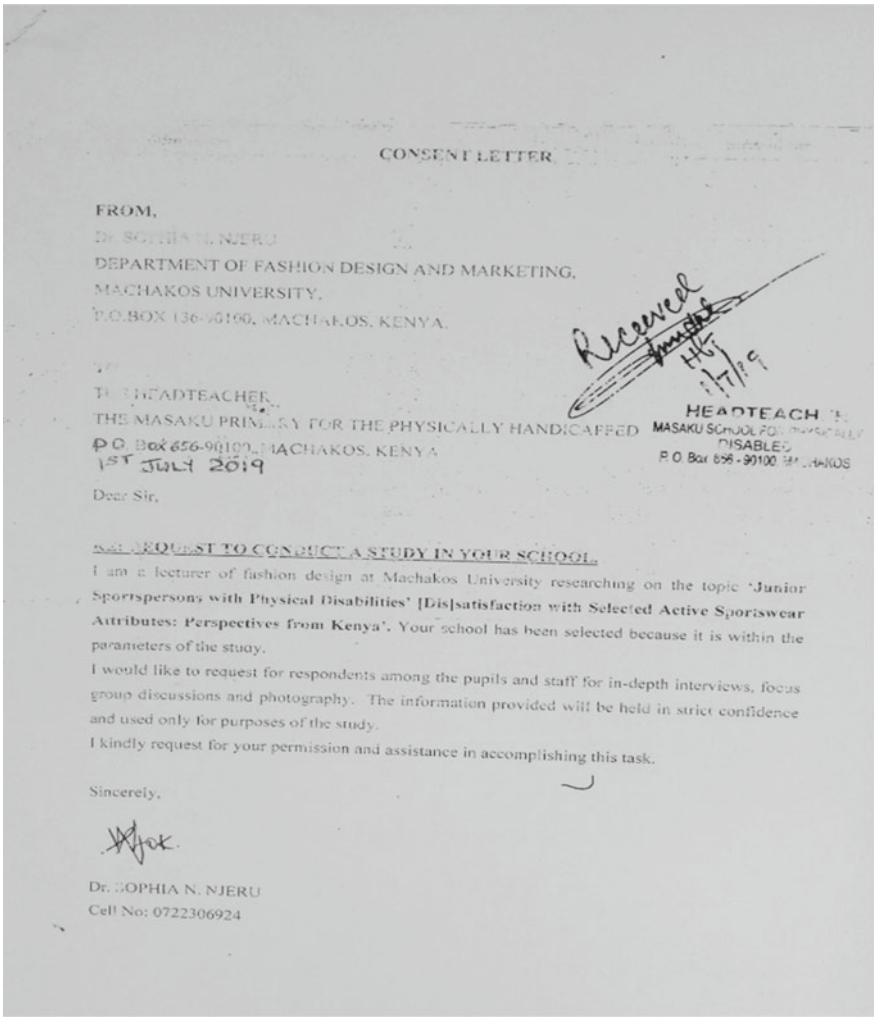
Significantly, the study takes up the challenge by Imbuki [12] to fashion designers to create attractive clothing styles that are functional to enhance and boost the self-esteem of consumers living with disabilities. The study also champions the implementation of United Nations *SDG* Goal 4 and 5 [38]. Further, it aims to support the implementation of Kenya's National Special Needs Education Policy Framework 2009, specifically the provision of research and documentation:

encourage research and dissemination of findings [23]. Evidently, active sportswear fashion actors' product development approach is unsustainable because they largely disregard the special apparel needs of JSLWPDs.

Appendix I

Consent Letter

Consent letter



CONSENT LETTER

FROM,
Dr. SOPHIA N. NJERU
DEPARTMENT OF FASHION DESIGN AND MARKETING,
MACHAKOS UNIVERSITY,
P.O.BOX 136-90100, MACHAKOS, KENYA.

Received
HEADTEACH
MASAKU SCHOOL FOR PHYSICALLY DISABLED
P.O. Box 656-90100 MACHAKOS

TO: HEADTEACHER,
THE MASAKU PRIMARY FOR THE PHYSICALLY HANDICAPPED
P.O. Box 656-90100, MACHAKOS, KENYA
1ST JULY 2019

Dear Sir,

REQUEST TO CONDUCT A STUDY IN YOUR SCHOOL.

I am a lecturer of fashion design at Machakos University researching on the topic **'Junior Sportspersons with Physical Disabilities' [Dis]satisfaction with Selected Active Sportswear Attributes: Perspectives from Kenya'.** Your school has been selected because it is within the parameters of the study.

I would like to request for respondents among the pupils and staff for in-depth interviews, focus group discussions and photography. The information provided will be held in strict confidence and used only for purposes of the study.

I kindly request for your permission and assistance in accomplishing this task.

Sincerely,

Dr. SOPHIA N. NJERU
Cell No: 0722306924

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