International Journal of Global Science Research **ISSN: 2348-8344 (Online)**
Vol. 7, Issue. 2, October 2020, pp. 1302-1307 **DOI: 10.26540/ijgsr.v7.i2.2020.152**
***Available Online* at www.ijgsr.com**

Research Paper

Innovations in Sportswear

Anima Jamwal
Department of Home Science, Isabella Thoburn College, Lucknow, Uttar Pradesh, India
Email: animajamwal288@gmail.com

Received: 07/05/2020
Revised: 10/05/2020
Accepted: 27/05/2020

Abstract: Sportswear is a major industry in itself. Sportswear market globally was valued at $167.7 billion in 2018 and is estimated to reach $ 284.1 billion by 2026 (according to allied market research.com). Other analyzers and estimators also put the figures close to this. As per Keerley (2019) the sportswear market in India was valued at over 540 billion Indian rupees in 2018, which is over 100 billion more than the previous year and is looking for an exponential rise in near future. This magnanimous industry is providing employment to millions of people and is expected to help in bringing down the unemployment even further in near future. So what is the reason for the spectacular success of this particular category of wearables? Well! although there are many factors contributing, one major factor is the tremendous amount of Innovations in Sportswear. There have been several interesting researches and innovative developments in this area and it is attracting attention of new age scientists.
Keywords: *Sportswear, Technical advancements, industrial, performance*

INTRODUCTION:

Sportswear is one of the fastest growing sector in textile and fashion industry. It has become a huge revenue generator and generous human resource engager. Sportswear has also become a driving force for new trends in fashion and for textile innovation. It is an area that has been able to very successfully exploit the new age technology to create high performance fabrics and garments. Sportswear have been helping the athletes to maintain or even improve their performance, either by optimizing their thermal physiology, supporting their movements with an optimal combination of elastic and compressing structures since quite some time but now it can even have embedded sensors to monitor the activity and physiological status of the wearer. The latest advances of textile technology have all found innovative applications in the sports industry like:

- New materials for example maestley or fabric application of aerogels.
- Aerodynamically higher fabric or design structures adapted to the athletes' body shape and specific movements like

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v7.i2.2020.152

novel designs for swimmers, combining the swimsuit, cap, and the eyewear all in one. The unique pattern allows the swimmer to move swiftly, with comfort and with increased hydrodynamic efficiency. A three dimensional mapping technique is used to measure the size of the head and face of the wearer, to provide maximum comfort and to achieve better performance

- Polymers responding to specific and non specific stimulus like revolutionary sports apparel technique which wicks moisture and keeps discomfort of sweat away. It makes use of special cooling polymers in form of little blue rings. The moment these rings come in contact of sweat or moisture, they immediately swell up causing a cooling sensation. This technology can be used for creating headwear, collars, trousers and shirts for men and women.
- A wide range of finishes in the nanometer range for optimal performance
- Products attached with wearable sensors like jackets that can keep the wearer warm with the help of sensors attached to the garment. The jacket automatically adjusts temperature based on the existing weather conditions. For instance, if a skier wearing the jacket is exposed to cold air, the gear keeps the body warm.
- Customized products for specific requirements like intelligent textiles to help performers monitor their activities. In this a mini data cell is placed in a protective pocket, in the back of a sportsperson's base layer garment. A series of electrodes are woven into the fabric along with sensors. The cell transmits wireless signals and information regarding the performances of a player to a distant computer. This technology has been adopted in sportswear of football players allowing the coach to monitor each and every movement, heartbeat, and make comparisons.
- Products that are more safe for sportsmen as a wear like sportswear with plastic and heavy finishes around the elbows, knees, and areas prone to abrasions to avoid frequent injuries
- Products that add to safety of sportsmen especially where the activity itself is loaded with occupational hazards like skiers and snowboarders require a sound protective gear while performing to prevent gruesome physical damage. For which scientists and designers have created body suits that turn into airbags and protect the wearer from possible injuries. Sports apparel with the use of smart textiles consists of an in built rescue system, that sends signals, in case a skier or snowboarder is stuck in an avalanche. Such secure technologies in sportswear have made skiers and snowboarders perform stunts and take risks confidently.

Sportswear is no longer limited to sports persons only. Factors such as increased participation in healthy and physical activities, specialty clothing, increased performance requirements, fitness and sports dressing related to self-image and lifestyle, greater consumer demand and innovative materials have had a significant influence on the growth of the sportswear technology. Some clothing, originally made for sports, have now become classics as they are in regular use like boxer-shorts, polo-shirts, jogging suits, sneakers. Such sportswear have become more fashionable and thus acceptable to a larger group of consumers. In fact now a days, the term “athleisure” is used for clothes that are designed to be “worn both for exercising and for doing

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v7.i2.2020.152

(almost) everything else. Contemporary Sportswear requires aesthetic features such as an attractive appearance and a pleasant look as well as functions to improve wearer's activity provide extra comfort and promote the health of the wearer. Today's garments for sports and active outdoor wear are lighter, softer, more durable and easy to maintain. Properties directly related to consumer satisfaction including thermal insulation, moisture-permeable waterproof properties, water repellency, ultraviolet ray shielding performance, moisture absorption, perspiration absorption, quick dry ability, anti-bacterial deodorizing properties and stretch ability, are mainly considered while evaluating quality of sportswear these days. Some other desirable attributes of functional sportswear include absence of dampness and soft and pleasant touch.

Sportswear, according to Bharadwaj (2010), is subject to unique demands, problems and concerns. It is often employed in extreme physical and environmental performance conditions with requirements for covering and "assisting" the active body. Not only must it protect the body from extreme physical surroundings as is the case with extreme sports, but it must also protect the surroundings from the impurities connected with extreme bodily exertion. Such concerns are among those addressed by new tailoring and textile technologies. There is also the need to satisfy the desire for a heightened aesthetics of sports and sports-recreational activity. Rothenberg (2016) also reports that it is the styling and aesthetics that is in focus. Up to the beginning of the twentieth century sportswear looked almost identical to work clothes or everyday apparel. But, in the first decades of the twentieth century, it was realized that sportswear design should be different from general fashion design due to its practical function being clearly different from one sport to another. Aesthetics gradually entered into the picture with colors and patterns used to distinguish players and teams seizing the attention of the spectators.

Rossi (2018), who conducted a survey on student athletes' psychological and physiological evaluations of sportswear, indicated that subjects agreed that sportswear has an important effect on their performance. A series of properties related to sportswear were considered. Subjects found ease, moisture sorption, softness, air permeability and elasticity to be important properties in sportswear, and other properties such as color, brand, appearance and price were considered as less important. However, the subjects ranked both appearance and price as significantly more important when the survey changed the type of question to a priority order. The responses of male and female athletes were completely different. According to males, appearance, color and brand were more important, whereas females ranked durability, ease, softness and moisture sorption as priorities. The subjects reported that the most important sources of discomfort were caused by perspiration on the skin because of poor moisture sorption, restriction of movement and abrasion. This shows why a wide range of sportswear is now available in fashion market. We now have a range of different fashionable garment types including gymnastic outfits, casual sportswear, youth-oriented casual wear, fitness clothing and sportswear, performance sportswear, commercially available sportswear, technical sportswear garments, and exclusively manufactured tracksuits. The androgynous nature of most sportswear apparel makes it a playground for fashion designers with a wish to break the traditional boundaries between male and female dress. The first trousers for women were seen on bicycling and mountaineering women, and

International Journal of Global Science Research
Vol. 7, Issue. 2, October 2020, pp. 1302-1307
Available Online at www.ijgsr.com

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v7.i2.2020.152

tennis pullovers found their way from the tennis court into the wardrobes of 1920s fashionistas.

Contemporary technology has developed several mechanical models where tangible results can be achieved by using simulation technology, multi dimentional control on garment pressure during wear. A technique called Finite element method is used to decifer the relationship between clothing pressure comfort and tight-fit active sportswear. Based on analyzing the contact characteristics between the human body and the garment, a mechanical model was developed using the theory of dynamic contact mechanics. A set of perfectly fitting sportswear made of either cotton denim or knitted nylon fabrics, was successfully simulated. The contact between the body and the garment was modeled as a dynamic sliding interface. The predicted pressure was close to the magnitude of experimental measurements, indicating that the model was able to simulate garment pressure during wear with reasonable accuracy.

An avant-garde application of technology helps in improving performance by wearing socks that can regulate temperature, increase blood flow, and even decrease injuries. These pair of socks work wonders for athletes by increasing the arterial blood flow to supply more oxygen to the body; it helps reduce the muscle stress, calf cramps and muscle pulls, enhancing the wearers performance by 5%, which is highly significant in case of active sports arena.

Manufacturers have introduced the three dimensional measuring of body statistics using CAD to provide tailor made and better fits. Digital apparel samples are created and adjusted based on a sportsperson's virtual fit. Testing movements and performance of the sportswear is done by making the virtual model pass through a series of activities like jogging, cycling, and skating to analyze its efficiency. This has given rise to break through technologies and innovations in the field of sportswear.

Sustainability is intimately bound up with much of the contemporary innovative performance clothing. However, sometimes it is difficult to match the two things. We can find such a strong case with Klepp et al (2016)where it is signified that awareness of enhanced performance with respect to odor-suppression is a constructed and problematic. Ingun Klepp and her team of researchers at the Norwegian National Institute for Consumer Research have compared odor-control fabrics to traditional sportswear fabrics like wool, cotton and polyester. Result of their study shows that new hybrid products involving moisture- and odor-management materials are being marketed with as yet uncertain consequences for the environment and personal health and safety. Several researches are being conducted to make these new age sportswear more eco friendly and especially ascertaining that chemicals and nano particles used in them do not get washed off during laundering process to pollute ground water. Another critical question is to ensure that long term use of these innovative sportswear does not result in any negative effect on human body.

Another crucial aspect related to new age sportswear is more soico- psychological in nature. The fact that sportswear has become increasingly acceptable as everyday clothing has led to a problematic and sensitive indicator of values. There are the values connected with functional attributes: Fit, mobility, comfort, protection; and there are those connected with the expressive attributes: roles, status and self-esteem. Here free reign is given to status values fundamentally connected with active sports, such as individualism, relaxation, spontaneity, informality, freedom, autonomy

ISSN: 2348-8344 (Online)
DOI: 10.26540/ijgsr.v7.i2.2020.152

and independence, functional practicality and fit-for-purpose, but also more "elitist" desires such as denoting stylishness and fashionableness, prosperity, dynamism, sophistication, smart image, expressing personal style, and, increasingly: sustainability.

Sportswear industry is growing at a very fast pace and innovations in this field has contributed very significantly in that. But there still a lot of things to ponder upon and decisions to be made. So as the good we do to the human health, does not result in degradation in health of the environment and earth.

REFERENCES:

https://www.alliedmarketresearch.com/sports-apparel-market (May 04, 2020)

Keerley S. (2019) https://www.statista.com/statistics/1049792/india-market-value-sportswear/ (May 4, 2020)

Bhardwaj V. (2010) The International Review of Retail, Distribution and Consumer Research Volume 20, 2010 - Issue 1 Published online: 18 Feb 2010

Klepp I. (2016) The Journal of Design, Creative Process & the Fashion Industry Vol 8 issue 2 pp296-317

Rothenberg B. (2016) "For Some at Wimbledon, Nike's Dress Just Doesn't Do It." New York Times , June 29. Accessed July 14, 2016.

Rossi R. M. (2018) in High-Performance Apparel.

Anthony S. W. Wong, Y. I. Li. (2006) in Clothing Biosensory Engineering.

Gupta D. (2013) in Advances in the Dyeing and Finishing of Technical Textiles.

Saifee, F. (2009) in Smart Clothes and Wearable Technology.

Fuzz F. K., Subi, A., M. Strangewood, M. and Rabindra, M. eds. (2014) *Routledge Handbook of Sports Technology and Engineering* . London: Routledge. [Google Scholar]

https://www.fibre2fashion.com/industry-article/6998/ new-technologies-in-sportswear

https://www.sciencedirect.com/topics/engineering/sportswear

https://www.tandfonline.com/doi/full/10.1080/17569370.2016.1221931

https://www.sciencedirect.com/book/9780081009048/high-performance-apparel

https://journals.sagepub.com/doi/10.1177/004051750207200311

http://www.apparelviews.com/how-to-build-a-sportswear-brand/

Innovative Sportswear | Innovative fabric technologies in sportswear.

Joerg C. Tiller (2008) in Developments in Surface Contamination and Cleaning (Second Edition).

Gulrajani M. L. (2013) Advances in the dyeing and Finishing of Technical Textiles Woodhead Publishing

Gulrajani M. L. *(2011)* in Handbook of Textile and Industrial Dyeing.

Merriam Webster (2015) "Words We're Watching: *Athleisure*." Accessed July 14, 2016. http://www.merriam-webster.com/words-at-play/athleisure-words-were-watching. [Google Scholar]

Mette Bielefeldt Bruun and Michael A. Langkjær (2016) The Journal of Design, Creative Process & the Fashion Industry Volume 8, Issue 2: Sportswear and Textiles

Parthiban Manickam, Gopalakrishnan Duraisamy (2019) in Circular Economy in Textiles and Apparel.

Rossi R. M. (2018) in High-Performance Apparel.

http://www.nytimes.com/2016/06/29/sports/tennis/nike-wimbledon-premier-slam-dress.html?_r=0. [Google Scholar]

Shishoo R. (ed) (2015). Textiles for sportswear, Elsevier Woodhead Publishing Series.

Thompson R. (2016). "Tracksuit takeover." *FTWeekend* , June 26: 5. [Google Scholar]
Y. E. El Mogahzy(2009) in Engineering Textiles.