

**EXPLORING THE EFFECT OF FASHIONABLE TEXTILE ON SKIN: A REVIEW  
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**ABSTRACT**

Skin is the best organ of the body interacting with the environmental agents like physical, chemical, and biological agent. Skin covers the external surface of the body and is the largest organ of the body. The main function of the skin includes protection, thermoregulation, secretion, sensation and absorption. According to Ayurveda science the word "Twacha" is used for skin which is derived from "twak" Dhatu which means "to cover". The well-being of man depends upon the balance between his energy production and exchange of energy with the environment. This balance between body and environment is modified by the intervention of clothing. Now a day's traditional clothes are being replaced by the modern fashionable clothes which make the youngsters feel more confident and comfortable. The fashionable clothes hamper's the normal functioning of the skin and further leads to various skin disorders like kushtha etc.

**KEYWORDS:** Skin, *Twacha*, *kushtha*,**INTRODUCTION**

Skin is the largest organ of the body which covers external surface of the body. It is divided mainly into two parts they are epidermis and dermis.<sup>[1]</sup> According to ayurveda *Twaka* is a *Matrija avayava* and seat of *Sparshanendriya*. It is developed in tritiya masa i.e. third month of intrauterine life.<sup>[2]</sup> The function of skin includes protection, thermoregulation, cutaneous sensation, blood reservoir, excretion, absorption, defence etc. Our clothes form our second skin which provides us protection against the elements, besides conferring modesty. But for many of us, our skin cannot always tolerate the texture of the various fabrics. Now a day's various traditional costumes are replaced by fashionable clothes. These fashionable clothe though gives the attractive look but are harmful in many ways as they hamper the normal functioning of the skin. Hamper in the normal function of skin further lead to various skin diseases.

**Anatomy of Skin**

The skin, also known as cutaneous membrane is the largest organ of the body which covers external surface of the body. The total area covered by skin in adults is about 2 square meters and weighs 4.5-5 kg. About 16% of total body weight is formed by skin. It ranges in thickness from 0.5mm (0.02in) on the eyelids to 4.0mm (0.16in) on the heels.

The skin consist of two main parts

1. **Epidermis:** superficial, a vascular, thinner portion composed of epithelial tissue
2. **Dermis:** Deeper, vascular, thicker portion composed of connective tissue

Subcutaneous layer (hypodermis): Deep to the dermis but not the part of the skin, consist of areolar and adipose tissue.

The subcutaneous layer serves as a storage depot for fat and contains large blood vessels that supply the skin. It attaches skin to the underlying tissues and organ.

**Epidermis:** composed of keratinized stratified squamous epithelium. It contains four principal types of cells i.e. keratinocytes, melanocytes, intraepidermal macrophages and tectile epithelial cells.

**Layers of epidermis**

1. Stratum Basale: deepest layer of the epidermis composed of a single layer of cuboidal or columnar keratinocytes. It rests on the basement membrane.
2. Stratum Spinosum: superficial to stratum spinosum mainly consist of numerous keratinocytes arranged in 8-10 layers.
3. Stratum Granulosum: middle layer of epidermis, consist of 3-5 layers of flattened keratinocytes

4. Stratum Lucidum: present only in thick skin areas such as fingertips, palms and soles. It consists of 4-6 layers of flattened clear, dead keratinocytes.
5. Stratum Corneum: Outermost layer of epidermis consist on average dead keratinocytes of 25 – 30 layers of flattened. It is continually being shed and replaced by cells from the deeper strata.

**Dermis** – It is the second part of the skin composed of dense irregular connective tissue containing collagen and elastic fibers. It is divided into thin superficial papillary layer and thick deeper reticular layer.<sup>[3]</sup>

#### **Twacha according to Rachana Sharir**

According to Ayurveda, *Twacha* is a seat of *Sparshanendriya*. It carries the sensation of touch. It covers the external organ along with other sense organ. It is described as *Matrija avayava*.<sup>4</sup> It is made up of *panchamahabhutas* of which *vayu mahabhuta* is most prominent.

The development of skin occurs in *tritiya masa* i.e. third month of intrauterine life. The formation of skin results from heat generated in the process of union of *shukra* and *shonita* and the formation of other *dhatu*s in foetal body.<sup>[5]</sup> There are different views regarding the development of the skin. According to *Acharya charak* the development of the skin results from the *shukra shonita sanyog* and formation of all seven *dhatu*s.<sup>[6]</sup> According to *Acharya vaghbat*, the skin develops during the formation of blood. *Acharya Charak* has considered that the skin is made up of six layers.<sup>[7]</sup>

According to *Acharya Sushruta* the seven layers of skin are

*Avabhasini* – This is the first superficial layer. It is responsible for the color and shadows of five types i.e. *prabha*. It is seat of *sidhma*, *padmakantak* and measures about 1/18<sup>th</sup> part of *vrihi*.

*Lohita* – It measures 1/16<sup>th</sup> part of *vrihi*. It is the seat for *tilakalak* i.e. mole.

*Shweta* - This is the third layer of skin having thickness about 1/12<sup>th</sup> part of *vrihi*. It is the seat for *Charmadala*, *Ajagallika* and *mashaka*.

*Tamra* – 4<sup>th</sup> layer having thickness of 1/8<sup>th</sup> part of *vrihi*. It is the seat for different type of skin diseases.

*Vedini* – It is the fifth layer and measures 1/5<sup>th</sup> part of *vrihi*. It is the seat for *kushtha* and *visarpa*.

*Rohini* – It is the sixth layer which has a thickness of one *vrihi*. It is the seat for *granthi*, *apacha*, *arbuda*, *shilpada* and *galaganda*.

*Mamsadhara* – It is the seventh layer with thickness of two *vrihi*. It is the seat for *Baghandar*, *vidradhi* and *arsha*.<sup>8</sup>

#### **Function of the skin**

##### **Protection**

Skin acts as a protective barrier from:

- Mechanical, thermal and other physical injury;
- Harmful agents;

- Excessive loss of moisture and protein;
- Harmful effects of UV radiation

#### **Cutaneous Sensation**

Cutaneous sensation are sensation that arise in the skin, including tactile sensation- Touch, pressure, vibration and tickling as well as thermal sensation such as warmth, and coolness. The another cutaneous sensation, pain, usually is an indication of impending or actual tissue damage

#### **Blood Reservoir**

The dermis houses an extensive network of blood vessels that carry 8-10% of the total blood flow in a resting adult.

#### **Excretion and absorption**

Skin normally has a small role in excretion and absorption. Besides removing water and heat from the body, sweat also excretes small amount of salts, carbon dioxide, ammonia and urea.

#### **Defence mechanism of skin**

Skin act as a first line defence along with tears, urine flow etc. The barrier function of the epidermis is mainly mediated by corneocytes in the stratum corneum. The stratum corneum is composed of three layers and it is both an outside – in barrier to prevent the entry of foreign substance and microorganisms and inside out barrier to prevent water loss.<sup>[9]</sup>

#### **Color of skin**

##### **Evolution of skin color**

The skin coloration of early humans is considered to be similar to that of our closest relatives, the chimpanzees, being white or lightly pigmented and covered by with dark hair. Evolution of hairless state in the skin is closely linked with the changes in the sweat gland distribution pattern.<sup>[10]</sup> During the course of evolution, the critical function of integument (skin) was maintained through an increased number of sweat glands, particularly in facial region.<sup>[11]</sup> This helps in enhancing the rate of evaporative cooling. The brain is extremely sensitive to temperature. The brain expansion and increased activity required high level of cooling to maintain temperature. The hairless state skin is evolved in order to facilitate thermoregulation through an increased number of sweat formations. However this creates a special need for protection of sub-epidermal tissue against UV. This protection was accomplished by an increase in melanization of the skin.

Skin color is due primarily to the presence of a pigment ‘Melanin’.

Two forms of ‘melanin’ are seen –

1. **Pheomelanin** – Red to yellow in color, mostly responsible for light complexion.
2. **Eumelanin** – Dark brown to black in color, responsible for dark complexion.

Melanin is normally located in the epidermis or outer skin layer. It is produced at the base of the epidermis by specialized cells called Melanocytes. These cells have photosensitive receptors similar to those in the eye that detect UV radiation from sun and other sources.

Melanin acts as a protective biological shield against ultraviolet radiation. By doing this it helps to prevent sunburn damage that could result in DNA changes and several kinds of malignant skin cancer.

Ultraviolet radiation reaching the earth usually increase in summer and decreases in winter. The skin's ability tan in summer time is acclimatization to this seasonal change. Tanning is primarily an increase in the number and size of melanin granules due to the stimulating UV radiation.

### Thermoregulation

Thermoregulation generally refers to four mechanisms: Sweating, Shivering, Vasodilatation and Vasoconstriction. Sweating increases body heat loss by increasing sweat evaporation. Shivering produces heat by involuntary movement of muscles. Vasodilatation and vasoconstriction refer of change in blood vessels diameter that affects skin temperature of changing the rate of blood exchange with the interior.

In the heat, increased conductance below the skin surface (due to increased blood flow) facilitates heat transfer from body interior to the skin. Then convection and environment.

In the cold muscles tensing and shivering increases heat production and body temperature. Decreased Conductance (due to decreased blood flow) keeps the heat from escaping to the cold environment. This combination of heat loss and heat gain control mechanism is able to maintain human body core temperature within a very small range inspite of variation in metabolic output.<sup>[12]</sup>

### SKIN PH AND ACID MANTLE

Skin is the ultimate multi tasker, performing several roles for overall wellbeing. The most important role it plays is as a protective barrier between our bodies and outside world and skin pH is one of its protective mechanisms.

The pH of skin is between 4.5 to 6.2 i.e. slightly acidic in nature. While body's internal environment maintains a near neutral pH. This creates a steep pH gradient of 2-3 units between startum corneum and underlying epidermis and dermis. It is been demonstrated that several key enzymes involved in synthesis and maintenance of a competent skin barrier are largely impacted by pH.

Acid mantle is a very thin, slightly acidic film on the surface of human skin acting as a barrier to bacteria, viruses and other potentials contaminants that might penetrate the skin.

Factors like air pollution, antibacterial product, cosmetics, detergents, antibacterial soaps and gels, skin moisture, sweat, over exposure to sun may affect the pH of skin which may cause damage to acid mantle core of skin which further disturbs the barrier function of skin.

### Effect of different textile on skin

Your clothing doesn't just look great. It also absorbs or blocks harmful ultraviolet radiation and remains one of the most effective forms of protective agent.

A fabric must have UPF (Ultraviolet radiation Protection Factor) of 30 to qualify for the skin cancer foundation's seal of recommendation. AUPF of 30- 49 offers very good protection, while UPF 50 + rates as excellent.

### TEXTILE HARMFUL FOR BODY

Nylon – Starting from socks to underwear nylon is one of the most used fabrics. It is cheap and more durable as compare to cotton to cashmere. Nylon doesn't absorb sweat from body. More importantly nylon fabric has an intermediate binding ratio with P.AERUGINOSA a type of bacteria which can cause bad body odour as well as skin infection.

Polyester – Smooth and soft when touch so especially popular for sportswear. We wouldn't say that polyester is skin friendly. It isn't a very breathable fabrics like nylon it doesn't absorb sweat. Another problem is lack of circulation. It is found that people who wear polyester clothes are likely to get skin infection or has worst body odour. This is because bacteria grow easily on polyester then that on cotton.

Spandex–Mostly used by superhero. It doesn't help sweating when used for long period. When you sweat in spandex it sticks around collecting bacteria which further leads to bad odor.

Acrylic – Acrylic fabrics are made up of acrylonitrile, which is carcinogenic and a mutagen. Exposure to this substance can cause headache, nausea, dizziness, difficulty in breathing, limb weakness etc.

### TEXTILE SAFE FOR BODY

Textiles like cotton, merino wool, cashmere, hemp, silk, bamboo, linen are safe for UV protection, Hypoallergenic, durable, temperature and moisture regulating, slow down aging, help in eczema and asthma, etc.

### EFFECT OF VARIOUS CLOTHES ON BODY

Headscarves - Wearing of the headscarves may result in cervical range of motion limitation. The duration of wearing headscarf is key factor to limited cervical range of motion an increase in cervical joint position error.<sup>[11]</sup>

Necktie – It is found that continuous use of tight necktie leads to jugular constriction which further leads to an increased episcleral venous pressure and subsequently

intraocular pressure, a common risk factor for glaucoma.<sup>[12]</sup>

Tight underwear – In male wearing tight underwear can push the scrotum against the body, causing the testes to rise in temperature which further leads to decreased sperm count.<sup>[13]</sup>

In females wearing tight underwear can cause chafing and if bacteria and moisture become trapped against the skin, it can potentially cause yeast infections or urinary tract infections.<sup>[14]</sup>

Tight jeans – In male tight jeans may have higher risk of suffering from low sperm counts. Tight jeans increase the temperature of genitals by decreasing the ventilation which may further lead to infertility. It may also squeeze the testicles and may cause damage to genitals.<sup>[15]</sup>

In females tight jeans may increase the risk of urinary tract infection and yeast infection.<sup>[16]</sup>

Wearing tight jeans may also affect the hip joint and restrict the mobility of the lower limb which indirectly affects the spine.

Shapewear – Shapewear are mainly targeted by women who want a perfect hourglass figure but it has some ramification on body. It compresses the lower lobes of lungs preventing them from expanding completely during breathing which hamper lung function.

As a waist is constricted, the heart has to exert more pressure while pumping which may lead to palpitations. It also compresses stomach, colon, Intestine and decreases bowel movement and affects digestion. Shape wear also causes bloating and abdominal discomfort, compresses bowel, increase pressure on bladder causing stress incontinence. The tight elastic bands exert pressure on your thigh, compressing nerves and also limiting blood circulation that lead to tingling and numbness in your legs. They can also elevate condition of varicose veins in women who are genetically predisposed to them. It also tends to trap moisture within it, providing a hospitable environment for a host of bacteria, which might lead to skin rashes or other infections.

Tight bras - The lymphatic vessels are very thin, and are extremely sensitive to pressure and are easily compressed. Normally the lymph fluid washes out waste materials and other toxins away from the breast. The tight bras restrict the lymph flow in breasts so toxins can start to accumulate in breast and that can help cancer to develop.<sup>[17]</sup>

#### CHANGES IN SKIN DURING SUNBURN

When ultraviolet radiation from the sun reaches the skin, it damages the skin cells and cause mutations in their DNA. Our bodies have a lot of amazing mechanism to prevent and even correct these mutations. But if the skin

cells get more UV exposure than they can handle, the damage may be beyond repair, and cells die off. Blood vessels dilate to increase blood flow and bring immune cells to the skin to help to clean up the mess. All this causes the redness, swelling and inflammation.<sup>[18]</sup>

The UV rays that we are exposed to here on the earth's surface consist of UVB and UVA photons. The UVB cause significant damage to DNA and are the primary cause of sunburn and skin cancer while UVA rays penetrate the deeper layers of skin which causes premature aging of the skin and immunological problems. A sunscreen products acts like a very thin bulletproof vest, stopping the UV photons before they reach the skin and inflict damage.

#### DISCUSSION AND CONCLUSION

The skin is the largest organ of body exerts a number of essential functions ensuring homeostasis of the whole body. In the present review barrier function of skin, thermoregulation, antimicrobial defence and the skin associated immune system are discussed. Barrier function is provided by the dynamic stratum corneum structure composed of lipids and corneocytes. Impairment of barrier function of skin can be due to injury and inflammatory skin diseases. Textiles in particular clothing interact with skin functions in a dynamic pattern. Mechanical properties like roughness of fabric are responsible for non specific skin reaction like wool intolerance or keratosis follicularis. Thermoregulation which is mediated by low blood flow and evaporation of sweat is an important subject for textile- skin interactions.

Clothing we choose not only gives the attractive look but also plays important role in thermoregulation, defence, protective function of skin. Textiles such as Nylon, Polyester, Spandex, Acrylic are harmful for body while textiles such as cotton, wool, hemp, silk, linen are very safe in every aspect for body. Some important structures of body are only protected by clothing so one should be very careful while choosing the clothes and textile of clothes. Various diseases can be prevented by proper clothing like facial paralysis can prevented by head scarf by protecting the facial nerve. Also torsion of testies can be avoided by giving proper support to testies by clothing. Along with proper clothes proper use of cosmetics also helps in protection of skin so one should be aware in using the proper cosmetics.

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