STUDY OF COMPARATIVE PSYCHOLOGICAL CHANGES INPSORIASIS AND ECZEMA

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CERTIFICATE OF THE SUPERVISOR

It is certified that work entitled –

Study of comparative psychological changes in Psoriasis and Eczema

an original research work done by Vd. Priya Vishal Naik

Under my supervision for the degree of Doctor of Philosophy in Ayurveda Samhita Siddhant, to be awarded by Tilak Maharashtra Vidyapeeth, Pune.

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I, Vd. Priya Vishal Naik, am the Ph. D Scholar of the Tilak Maharashtra Vidyapeeth in Ayurveda Samhita Siddhant subject. Thesis entitled –

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ABSTRACT

The present study deals with the inter-relation of mind and body. According to Ayurveda, mind and body along with the soul are like three pillars supporting life. Also mind and body are considered as abodes of disease. Hence, a physical disease may show psychological symptoms in due course and vice versa. To elaborate this concept, psychological symptoms observed in the later stages of Psoriasis and Eczema were considered for study. The present study is entitled 'Study of comparative psychological changes in psoriasis and eczema'

The main aim of the study was to compare psychological effects of Psoriasis and Eczema on the basis of conceptual study of the principle '*te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti'*. To achieve this, the objectives were designed to study the above mentioned concept as well as the correlation between severity of Psoriasis and Eczema (somatic diseases) with the quality of life of the patients. The data collection tools used for the study were Questionnaire to decide the severity of Psoriasis – Psoriasis Area and Severity Index (PASI), Questionnaire to decide the severity of Eczema – Eczema Area and Severity Index (EASI) and Questionnaire to assess the effect of skin disease on the mental health and quality of life of the subject- Skindex-29. 113 patients from each group viz. Psoriasis and Eczema were selected by convenient sampling method. Cross-sectional study design was implemented for the study. The method used for data collection was survey with self administered questionnaire. Not only stress, but also other factors such as emotional aspects affected by the skin diseases were also studied. The data generated through three indices was subjected to unbiased statistical analysis using Spearman's correlation coefficient and Mann Whitney U test to draw conclusion.

Both skin diseases were more common in males than females and in the age group 31- 45 years. Also majority of the patients were accustomed to AC environment which hinders the functioning of *swedavaha srotas*, leading to

skin disorders. Scaling and erythema in case of Psoriasis and thickness and scratching in case of Eczema cause considerable psychological changes. Besides more the surface area affected, more are the psychological changes.

On the basis of this study, it can be concluded that, there a correlation between severity ofsomatic diseases particularly Psoriasis and Eczema and quality of life of patients. Somatic or psychological diseases if present in the body for a long duration, produce changes in each other. There is a significant difference in psychological stress and quality of life of patients suffering from Psoriasis when compared with patients suffering from Eczema.

Hence it can be quoted that mind and body are interlinked and this concept if used in the treatment of psychosomatic or other diseases can be highly beneficial.

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ABBREVATIONS

Su.	Sushruta Samhita
Cha.	Charaka Samhita
Ash.san.	Ashtanga Sangraha
Ash.Hri.	Ashtanga Hridaya
Yo.Ra.	Yog Ratnakar
B.P.	Bhaav Prakash
Ka.Sa.	Kashyap Samhita
Ma.Ni.	Madhav Nidan
Su.	Sutrasthana
Sha	Sharirsthana
Ni.	Nidanasthana
Vi.	Vimanasthana
Chi.	Chikitsasthana
Ut.	Uttartantra

INTRODUCTION

Ayurveda, the science of life, deals with physical, psychological as well as spiritual well being of an individual. It takes into consideration the whole body, mind and spirit while dealing with the maintenance of health, promotion of health and treatment of ailments in holistic approach.

The base of the existence of the universe is the combination of mind, body and soul[1]. The absence of even one of the factors can hamper the concept of human life. What we call life, is the soul along with the mind. When *'kha'* etc five basic elements are combined with it, *shad-dhatu purusha* is born[2]. Treatment is done on this *purusha*[3]. Retrospectively the one, who is the subject of treatment, is the subject of disease and diagnosis as well. Hence we can say that disease occurs in this *Shad-dhatu prusha,* comprising of the *panchmahabhoota* and *chetna* (soul and mind).

The strata of health are body and mind. Any damage to these strata will lead to disease also, which is then called *vyadhi-aashraya*[4]. Even if they maintain their individual identity, they still exert an effect on each other. While explaining the infinite combinations of diseases due to *sharir* and *manas doshas,* Aacharya Charak also stated that prolonged presence of these diseases in the body cast an effect on each other[5]. We find many instances of positive and negative effects of emotions on the body, such as fear causing trembling of hands and feet or anxiety causing increase in heart rate.

On the same grounds, Ayurveda has also considered a connection between the skin and mind. Psychological factors have conventionally been connected with the onset, development and persistence of skin disease. Skin is the first presentation of human body. In *Ayurveda Samhita*, skin is described as one of the five *Dnyanendriya* (sensory organ), which is responsible of perception of *Sprasha-Dnyana* (touch sensation)[6]. Therefore, it plays a major role in the physical and mental wellbeing of an individual. Charakacharya has described the skin (*Twak*) as *Chetah-Samavayi*, i. e. the skin has eternal relationship with *Manas* (psyche/mind)[7]. Skin conditions can impose ill-effects on mind and vice-versa.

Psychodermatology, a newly emerging branch, studies the manner in which skin and mind interact with each other. Psychiatrics described as the science of mental phenomena

which are not visible externally, and dermatology is related to the observable facts in skin which can be seen externally[8].

Psychodermatology covers all aspects of how the mind and body interact in relation to the onset, formation and progression of skin disease.

Ayurveda has given more emphasis to this aspect of causation and management.

*Kushtha Roga i*s one among the *Cheerakari Vyadhi* (chronic diseases) and also included in *Ashtamahagada* as the disease *Kushtha* is very difficult to cure[9]. Even though the skin diseases do not cause loss of life, they create comparatively greater mental discomfort due to the flawed skin. This psychological stress leads to manifestation of mental and emotional disorders. Patients with skin disorders, such as urticaria, psoriasis, acne, atopic dermatitis and rosacea always experience physical, mental and socio-economic embarrassment in the society. This humiliation leads to mental stress which further aggravates the pre-existing disease[10].

The occurrence of skin diseases in India is 10-12% of which Psoriasis and Eczema, occupy a larger space[11]. Psoriasis is a non-communicable, chronic inflammatory skin disease. It is characterised by plaques of red skin and silver coloured scales, mostly over elbows, knees, scalp, back, accompanied by severe itching, inflammation and pain. About 30-50% cases with psoriasis, develop psoriatic arthritis. World-wide prevalence of this disease is 2%, but in developed countries the percentage is higher being 4.6%. As mentioned in an article published in Indian Journal of Dermatology, Venereology and Leprology (2010), the prevalence of Psoriasis in India is 0.44-2.8%. According to an article published in Indian Dermatology Online Journal (2014)[12], the point prevalence of Psoriasis in India is 8%. Risk of a child developing psoriasis is 41%, if both parents are affected by it and 14% if one of the parents is affected[13].

Psoriasis also has an impact on the changes in behavior, mental stress and may face embarrassment, ridicule, and avoidance by the society. Depending on the severity and location of the lesions, the patient may experience discomfort and disability. The occurrence of anxiety and depression is more in these patients in contrast to normal Population[14].

Eczema presents as an inflammation of the skin with itching. Also redness, blisters and skin thickening may be present to a varying extent. A survey conducted shows an

increase in Eczema is 2-5 times in the last 30 years. An article published in 'Annals of Nutrition and Metabolism' in 2015 quotes incidence of 15-20% in children and 1-3% in adults worldwide. According to an article published in Indian Dermatology Online Journal (2014), the point prevalence of Eczema in India is 6.75%[15]. The itching is an uncomfortable feeling for the patient leading to nervousness, withdrawal, apprehension or depression. Insomnia due to scratching leads to exhaustion adding to the psychological stress.

Disfiguring dermatological conditions often run a chronic course, resulting in profound psychological morbidity, leading to secondary psychiatric disorders. Probably due to significant skin disorders, there are emotional disturbances and damaged psychological health, which in turn affects the quality of life of a patient. Even though both are skin diseases having a chronic course, it was important to see whether there are changes in psychological symptoms according to the disease symptoms. Furthermore, the type of psychological treatment for these diseases will also depend on the somatic symptoms as well as psychological changes.

In view of treatment goals, it is important to distinguish symptoms from the impairment. Symptoms can be defined as the distinguishing clinical features of a disorder. Impairment, however, is termed as the distress that can be caused by symptoms, and it can be physical, psychological, and/or social. The degree of impairment caused by a given symptom varies in different individuals; in fact, a patient can have a severity in symptom scale but not be harmed by it at all.

Conversely, a different patient of relatively mild severity may be greatly impaired by symptoms, with an enormously negative impact on their life. When it comes to treating the psychological impact of a dermatologic condition and improving the patient's quality of life, it is crucial that we take into account the impairment also and not just symptoms. Clinicians should consider psychological injury due to skin disease at all levels of severity levels.

While deciding on the treatment modules, a physician should take into consideration the somatic disease along with the psychological impact occurred due to that disease. This may help in quickening the recovery rate by subsiding both the type of symptoms. Such type of treatment will prevent the further inter-conversion of symptoms.

The present study was conducted to study the psychological effects of a somatic disease.

113 patients suffering from Psoriasis and 113 patients suffering from Eczema were selected by convenience (non-probability) sampling technique for this cross-sectional survey study. The data was collected from the study participants with the help of three indices - Questionnaire to decide the severity of Psoriasis – Psoriasis Area and Severity Index (PASI), Questionnaire to decide the severity of Eczema – Eczema Area and Severity Index (EASI) and Questionnaire to assess the effect of skin disease on the mental health and the quality of life of the subject- Skindex-29. It was also studied if the severity of the somatic disease matters in the level of psychological changes. Not only Stress, but also other quality of life, declined due to the somatic disease, was studied. The data generated through three indices was subjected to unbiased statistical analysis to draw conclusion.

Need of the study : Today's lifestyle is filled with stress and anxiety along with improper dietary habits. Hence we find the growing incidence of lifestyle disorders. Due to lack of time or ignorance, these diseases remain untreated for a long time. Gradually the somatic disease gives rise to anxiety, restlessness, or the psychological diseases start having an impact on appetite, weight loss or weight gain, skin and hair. This is where quality of life starts affecting adversely. The treatment of such conditions has to be done at the level of body and mind. In case of skin diseases, it further affects the self-esteem negatively. QOL in health care is the patients ability to enjoy normal life activities inspite of the disease. To break the vicious cycle of physical symptoms and emotional disturbances, it is important to study the body-mind relation in depth, which led to this study.

AIM AND OBJECTIVES

- **Aim:**

To compare psychological effects of Psoriasis and Eczema on the basis of conceptual study of the principle '*te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti'* (*Charak vimansthana6/8)*

- **Objectives:**

1. Conceptual study of the *siddhant* -'*te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti'*
2. To study the correlation between severity of Psoriasis and Eczema (somatic disorders) and psychological changes occurring in the patients
3. To compare the effect of Psoriasis on quality of life with the effect of Eczema on the quality of life of the patients.

- **Research Question:**

1. Is there a correlation between severity of somatic diseases and psychological health of patients as per the siddhant *te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti'* ?
2. Is there a significant difference in quality of life (due to somatic disease and associated psychic changes) of patients suffering from Psoriasis when compared with patients suffering from Eczema?

PREVIOUS WORK DONE

1. Comparative effect of Navayasa Rasayana leha and Medhya Rasayana along with Dhatryadhi Lepa in Ekakushtha Mehta Charmi, Dave Alankruta, Shukla VD Dhara ID- D054707, Pubmed ID- 24501516 AYU2013 July

   This work studied 111 patients to compare the efficacy of Navayasa Rasayana leha and Medhya Rasayana in Ekakushtha. Dhatryadi lepa was common in both groups. This work dealt with the treatment of Ekakushtha considering stress as a precipitating factor for skin disease. Here stress can be considered as a hetu of the disease. The inter-changeability of somatic and psychic diseases is not explained.

2. Pathophysiology of stress and Psychosomatic disorders in Ayurveda Vandana Verma, JS Tripathi, Sangeeta Gehlot B.H.U., Varanasi Aryavaidyan 2009 May;22(4): 230-236 Dhara ID- D002353

   Many psychosomatic disorders have been clearly described in Ayurveda, including different types of stressors that play a crucial role in the causation of disease. This study attempts to critically analyse the concept of stress and consequent psychosomatic disorders.

3. The Psychosomatic disorders and their management in Ayurveda, R.H.Singh Dept. Of Kayachikitsa, M.S.B.H.U.,Varanasi, Dhara ID-D001501, Pubmed ID-22556460 Ancient Science of Life 1981 July;1(1):41-48

   The psychosomatic disorders are the outcome of modern ways of life and changing value systems and hence their incidence is rapidly increasing. The scope of practice of yoga, saddvritta, medhya rasayan and similar other ancient measures in the prevention and treatment of these disorders is explored. But whether a somatic disease can present psychic symptoms and viceversa is not studied in this work.

4. A study on Prevention of Psychosomatic disorders through Swastthavrutta, S.Venugopala Rao, Y.Chauhan, IP Singh Dept of Basic Principles,

M.S.B.H.U.Varanasi, Dhara ID- D001410 Aryavaidyan 1992 November;6(2): 127-132

Mainly stress factor in psychosomatic disorder and its prevention through Swasthavritta, is studied in this work.

5. Psychoneuroimmunology of Psychological stress and Atopic Dermatitis: Pathophysiologic and Therapeutic updates, Andrea L.Suarez, Jamison D. Feramisco; PMID: 22101513, Acta Derm Venerol, 2012 Jan; 92(1): 7-15

   This study has explored the mechanism of psychological stress on Atopic Dermatitis. Stress largely affects the immune system and cutaneous neuropeptide relation.

DISTINCT FEATURE OF THIS STUDY IN COMPARISION TO PAST STUDIES:

Majority of the work related to skin diseases is dedicated to treatment or pathophysiology of the disease. The present study endeavors to focus on the psychic effects during the course of the disease, and also if development of psychic symptoms tend to deteriorate the skin disease. It will also study if the severity of the skin disease matters in the level of psychic changes. Stress along with other psychological aspects, altered due to the somatic disease is going to be studied. This may improve the approach in the treatment of skin disease. Somatic treatment should be coupled with psychological treatment. The holistic approach of Ayurveda is stressed upon through this study.

REVIEW OF LITERATURE

1) Integral relationship between *sharir* and *manas*

2) Twak Sharir

3) Integumentary System

4) Review of *Manas*

5) Psychological Aspects of Skin Diseases

6) Twacha- Manas Vyadhi Adhishthana

7) Kitibha Kushtha

8) Psoriasis

9) Vicharchika

10) Eczema

1. INTEGRAL RELATIONSHIP BETWEEN *SHARIR* AND *MANAS*

Health is defined as equilibrium of *doshas*, proper digestive fire, perfect unison of *dhatus, malas* and all physiological processes and harmony within the soul, sense organs and mind[16].*Ayurveda* is a science dealing with life. As quoted in *Charak Samhita, chetan purusha* (human being with life) is the *adhikaran* or authority of this science[17]. The *purusha* mentioned here is a combination of three factors namely *satva* (mind), *aatma* (soul) and *sharir* (body) which act as a tripod (foundation) for the existence of life[18]. *Aayu* or life is defined as a perfect amalgamation of physical body, soul, sense organs and mind[19]. In the formation of *garbha* (embryo), soul and mind, descending in the

engagement of *shukra* and *shonita,* play an active role[20]. Thus we can see right from the initiation of life the triad always continues to be in synchronization with each other. While explaining the three types of *satva,* it is quoted that the qualities of mind follow the corresponding qualities of physical body and vice versa. The type of *satva* and type of *sharir* complement each other[21].

The human body we are dealing with is an inseparable combination of physical body, mind and soul. This human body gets inflicted by various diseases. These diseases and their seat of occurrence are divided into two parts, namely, *sharir* (associated with the body) and *manas* (associated with mind). All the *aacharyas* have asserted this theory[22]. *Aacharya Dalhan* has quoted that *aatma* is not a seat of disease as it is *nirvikaar ie* no changes can be done to it[23]. Certain diseases are associated also with body just like *kushtha,* certain diseases are associated only with mind like *kaam, krodhav* etc, whereas some diseases are linked with both like *unmada*[24]. Though there is a demarcation in physical and psychological diseases, still many times or when the disease runs a chronic course, these diseases tend to affect or make changes in the other *aashraya*. When allowed to persist for long, these psychic diseases (*kaam* etc) and somatic diseases (*jwar* etc) may get combined with each other or increase the strength of each other[25]. In other words somatic diseases produce only somatic symptoms first, eventually psychic symptoms also appear. This is true in case of psychic diseases also[26].

This interrelation between the body and mind is reflected in many instances like symptoms of certain imbalances, treatment of a disease or even dietary factors.

The diet which we consume affects the body as well as mind. There are examples in the sacred *Bhagwadgeeta*, stating that the quality *(gunas)* of food which we consume highly influences our mental behavior. Eg: *satvic* diet boosts serene, balanced and happy thoughts. Likewise as quoted by *Aacharya Charak* the diet which possesses the right color, smell, taste and touch and which is consumed following all the dietary rules invigorates the mind. *Aacharya Chakrapani* has further explained '*satvamurjayati'* as promoting the strength of mind[27]. Analogous to that, food even when consumed in proper quantity is not digested properly if the mind is crowded with the emotions of worry, grief, fear, anger or irritability[28]. Hence the mind largely affects the physiological process of the body.

Similarly emotions also impact other physiological and psychological processes. Cheerfulness helps in retention of conception. Grief aggravates the progress of disease[29]. Fear factor leads to disease formation. Good memory, obedience, fearlessness and ability to provide information about the disease are the good qualities of patient[30]. *Ayurved Rasayan* commentary of *AshtangHridaya* describes fear (psychological urge to be controlled/*dharaneeyavega*) as one of the causes of disease[31].

The symptoms produced due to imbalances in *dhatu* or *srotas* are also connected with certain emotions. *Rasakshaya* exhibits restlessness, intolerance or irritability to loud sounds, increase of heart rate and distress on slight exertion[32]. The *rasavahasrotas* gets vitiated due to chronic stress or the tendency to worry[33]. Swedavaha srotas is vitiated by feelings of anger, grief or fear[34].

Many somatic diseases exhibit psychic symptoms. *'Alpapraanata'* which means *'maanas-haani'* or mental agitation is one of the prodromal symptoms observed in *jwara*[35]. Symptoms of *vatajagrahani* show signs of mental depression[36]. The exogenous type of *atisaar* is of psychological origin, caused by fear (*bhayaja*) and grief (*shokaja*)[37]. *Dvishtharthasanyogajachhardi* is caused by as a result of mental aversion due to despicable, antagonistic, impure, unholy and disgusting odour, food or sight[38]. Vatajahridroga show the symptoms of weakness, grief, fear and inability to tolerate noise[39].

The diseases which are in incurable stage (*pratyakhyeya*) exhibit symptoms of excitement, restlessness, confusion and affect the sense organs[40].

These emotions also act as causative factors in certain diseases. Grief, fear and anger are the causative factors of *arochaka* (loss of taste)[41]. Worry, sorrow and anger are mentioned as the causative factors in *vaat-vyaadhi* (diseases due to vitiation of *vaat*)[42]. Sorrow and anger are the causative factors of *vaatajarsha* and *pittaj arsha* respectively[43]. Similarly sorrow and anger are also the causative factors of *vaatajgulma* and *pittaj gulma* respectively[44]. Anger is supposed to be the causative factor of *vaatrakta*[45].

The treatment modules in *Ayurveda* are broadly divided into *shaman* and *shodhan. Shodhan* or purification treatment is done on the body. However, one of its benefits includes cleansing the sense organs, mind and complexion[46]. One of the treatments for hiccups includes sudden threat, surprise, fear, anger, happiness, anxiety

etc.[47]The treatment of exogenous *atisaar* is exhilaration and consoling[48]. Treatment of *Dvishtharthasanyogaja chhardi* is similar, ie consoling, happiness and words pleasing to the heart[49]. According to *Ashtang Hridaya, achinta, harsha* along with *santarpan* (nourishing) therapy and proper sleep, an emaciated person will become stout like a boar. It is clarified in the commentary that *achinta* is absence of grief and *harsha* is pleasure of mind[50].

The symptoms of *tridosha gulma* include severe pain, burning sensation, raised and rigid lump. It is a serious condition diminishing the functioning of mind, body, digestion and strength. This has been quoted in Charak Samhita as well as in Madhav Nidana. But the explanation of '*manophaarinaam'* is given in *Madhukosha* commentary as '*manvaikalyakaarinam'* which means impairedness or anguish of mind[51]. Fear is one of the causative factors of abortion along with trauma, very spicy and hot foods etc[52]. The mental stress and extrinsic factors are the causative factors of stillborn child according to Madhav Nidaan[53]. Worry, grief, fear and anger are mentioned as the reasons for insomnia.

Asthavidha pareeksha is best described in *Yogratnakara*. The pulse rate is more in case of emotions like sensual pleasures and anger. It is diminished in case of worry and fear[54]. Delirium occurs due to fear and tremors are formed due to grief and anger[55]. Excess grief is one of the causes of metrorrhagia[56]. It is mentioned in the chapter of extrinsic fever in *Yogratnakara* that the symptoms due to lust, grief and fear should be treated like treatment of vitiated *vaayu*[57]. Also loss of taste (*arochaka*) should be treated with foods appealing to the mind, elation and consolation[58].

If a person gets struck by any thorn in darkness, he gets terrified by doubt of poisonous insect or animal bite and experiences fever, vomiting, fainting, burning sensation, weakness, confusion, and diarrhea. This is known as *shankavisha.* Even in the absence of actual poisoning, the person experiences symptoms only due to doubt or fear. The first and foremost treatment for it is consolation of the patient followed by treatment for poison and exhilaration[59].

Hence, it is seen that the body and mind are not two different entities but are two components of the same human body. Each of them have their own roles but still are dependent on each other.

2 TWAK SHARIR

Twak is that organ which completely covers *Medas Shonita* & all other *Dhatus* of the body[60]. The external covering of the body is called *Twak*[61]

A type of *Indriya* which envelops the body is called *Twagindriya*[62].

Synonyms:

Twacha- wrappering the body

Charma- moving nature

Chhavi– lighting up the complexion.
Chhadani- means to cover.

Sparshan– to give touch sensation.

Asrukdhara– holding blood inside the body.

***Twak Utpatti*:**

According to *Vagbhata*, *Twak* is formed by the essence of *Rakta* just like creamy layer is formed from boiled milk[63]. *Acharya Sushruta* had a good sense of observation of nature and application of that observation to explain many laws, principles and structures of human body. This is called *Drushtanta*. While explaining origin of *Twacha, Sushruta* has given the example of cream on milk surface.

During the *Paka* of *Shukra* and *Shonita* by *Agni* or *Pitta Dosha*, even types of *Twacha* appear on the surface of body of *Garbha* just like while heating milk cream appears on its surface[64].
Acharya Charaka has not gave any such description regarding genesis of *Twacha*.

Origin of *Twak*:

Acharya Charaka has described that every structure of the body develops from *Shadbhavas*in that *Twacha*is *Matruja Bhava*[65]**.** *Acharya Vagbhata* stated that *Twacha* develops from *Vayu Mahabhoota*.

Layers of *Twak*:

There is a great controversy among various Ayurvedic texts regarding number of layers *Twacha*. After studying number of *Twacha* we come to the conclusion that *Acharya Charaka*, *Vriddha vagbhata*, *Bhela* and *Kashyapa* has stated 6 types of *Twacha*, while *Acharya Sushruta* and *Bhavaprakasha* has stated seven types of *Twacha*[66] .

Different types of *Twacha*in *Brihatrayi*and *Laghutrayi*: *Brihatrayi*:

- **CharakaSamhita:**

In *Sharirsankhya Shareer Adhyaya* of *Sharir Sthana*, *Acharya Charaka* has described six types of *Twacha*.

Types of *Twacha* according to *Charaka*[67]:

- **Udakadhara:**

It is an outermost layer of *Twacha*. As per the name it holds *Rasadhatu* and *Lasika* inside the body and prevents their loss from the body.

- **Asrukdhara:**

It is the layer next to Udakadhara which is supplied by numerous blood vessels and it holds blood inside the body itself.

Acharya Charaka has given names only to first two layers of *Twacha*. He has described next layers of *Twacha* on the basis of diseases manifesting in them.

Thus, the *Trutiya* is the seat of manifestation of *Sidhma*and *Kilasa*. The *Chaturtha* is the seat of manifestation of *Dadru* and *Kushtha*. The *Panchami* is the seat of manifestation of *Alaji*and *Vidradhi*. The *Shashthi* is one excision on which causes loss of consciousness.

- **Sushruta Samhita:**

In *Garbhavyakarana Adhyaya* of *Sharirsthana*, *Acharya Sushruta* has described seven types of *Twacha,* their individual thickness and diseases manifesting in each layer.

These seven types of *Twacha* are as follows-

The first and outer most layer of *Twacha* is *Avabhasini*, which reflects all sort of complexions and also brightens *Pancha Chaya*.
It is the seat of *Sidhma* and *Padmakantaka*[68].

The second layer is called as *Lohita* and it is the seat of *Tilakalaka Nyachha* and *Vyanga*[69].

The third layer is *Shweta* and it is the seat of *Charmadala*, *Ajagallika* and *Mashak*[70].

The fourth layer is called *Tamra* which is the seat of varius types of *Kilasa* and *Kushtha*[71].

The Fifth layer is *Vedini* which is the seat of *Kushtha* and *Visarpa*[72].

The sixth layer is Rohini which is the seat of Granthi, Apachi, Arbuda, Shlipada and Galaganda[73].

The innermost and seventh layer is *Mamsadhara* which is the seat of *Bhagandara*, *Vidradhi* and *Arsha*[74].

- **AshtangaSangraha:**

In *Anga Vibhaga Shareer Adhyaya* of *Sharirsthana Vriddha Vagbhata* has described seven layers of *Twacha*.

Acharya Vagbhata has given description of *Twacha* more or less similar to *Charaka*. According to him, first layer is *Udakadhara*, second layer is *Asrukdhara*, third layer is the seat of *Sidhma* and *Kilasa*, fourth layer is the seat of all types of *Kushtha*, fifth layer is the seat of *Alaji* and *Vidradhi* and sixth layer is *Pranadhara*[75].

- **AshtangaHridaya:**

Acharya Vagbhata has not given any details of *Twacha* except the genesis of *Twacha* in *Ashtanga Hridaya*.

Laghutrayi:

- ***SharangadharaSamhita*:**

In *Kaladikakhyana Adhyaya* of *Prathama Khanda*, *Sharangadhara* described seven *Twacha*.

First layer is *Avabhasini*-seat of *Sidhma*,

Second is *Lohita*-seat of *Tilakalaka*,

Third is *Shweta* -seat of *Charmadala*,

Fourth is *Tamra*-seat of *Kilasa* and *Shvitra*,

Fifth is *Vedini*-seat of all *Kushtha*,

Sixth is *Rohini*-seat of *Granthi*,*Ganda* and *Apachi*,

Seventh is *Sthoola*-seat of *Vidradhi* and has thickness equal to two *Vrihi*[76].

- **MadhavaNidana:**

There is no description of *Twacha*in *Madhava Nidana*. However, the description of various *Kushtha* has been mentioned.

- **Bhavaprakasha:**

According to *Bhavaprakasha*, there are seven types of *Twacha*. The first is *Avabhasini* which is the seat of *Sidhma*, second is *Lohita*-seat of *Tilakalaka*, third is *Shweta* -seat of *Charmadala*, fourth is *Tamra*-seat of *Kilasa* and *Shwitra*, fifth is *Vedini* which is the seat of all *Kushtha*, sixth is *Rohini* which is the seat of *Granthi*, *Ganda* and *Apachi*. Seventh is *Sthoola*, the seat of *Vidradhi*[77].

Table No. 1. Showing names of *Twak* in different *Samhita*:

Sr. No.	***Charaka***	***Sushruta***	***Vagbhata***	***SharangDhara***	***Bhavprakash***
1	*Udakdhara*	*Avabhasini*	*Udakdhara*	*Avabhasini*	*Avabhasini*
2	*Asrukdhara*	*Lohita*	*Arukdhara*	*Lohita*	*Lohita*
3	*SidhmaKilasa*	*Shweta*	*Sidhma Kilasa*	*Shweta*	*Shweta*
4	*DadruKushtha*	*Tamra*	*Sarva Kushtha*	*Tamra*	*Tamra*
5	*AlajiVidradhi*	*Vedini*	*Alaji Vidradhi*	*Vedini*	*Vedini*
6	On cuttingone feelsBlindness	*Rohini*	*Pranadhra*	*Rohini*	*Rohini*
7	---	*Mamsadhara*	---	*Sthoola*	*Sthoola*

Table No. 2. Showing layer wise distribution of skin diseases:

Sr.	***Charaka***	***Sushruta***	***Vagbhata***	***Sharangdhara***	***Bhavaprakasha***
1	---	*Sidhma Padma kantaka*	---	*Sidhma*	*Sidhma*
2	---	*Tilakalaka Nyacha, Vyanga*	---	*Tilakalaka*	*Tilakalaka*
3	*Sidhma, Kilasa*	*Charmamdala AjgallikMa shaka*	*Sidhma Kilasa*	*Charmadala*	*Charmadala*
4	*Dadru, Kushtha*	*Kilasa, Kushtha*	*Sarva Kushtha*	*KilasaSh witra*	*KilasaShwitra*
5	*Alaji, Vidradhi*	*Kushtha, Visarpa*	*Alaji, Vidradhi*	*SarvaKushta*	*VisarpaKushta*
6	Blindness	*Granthi, Apachi, Arbuda etc.*	Blindness	*Granthi Apachi*	*Granthi, Apachi, Arbud*
7	---	*Bhagandara, Arsha, Vidradhi*	---	*Vidradhi*	*Vidradhi*

Twak Pramana:

In various Ayurvedic texts, there is a description of *Twacha*, its layers and diseases occurring in each layer of *Twacha*. *Sushruta Samhita* is unique for the description of thickness of *Twacha*.

Here, *Sushruta* has described thickness of *Twacha* in the measurement of *Vrihi Pramana*, where, *Vrihi*is a grain of rice. It says, *Avabhasini Twacha* has thickness equal to 1/18thpart of 1 *Vrihi*and *Lohita* is 1/16th,*Shweta* is 1/12th,Tamra1/8th,*Vedini1*/5th, *Rohini*is1, *Mamsadhara* is 2 *Vrihi*. But this measurement of *Twacha* is not throughout

same for all the body parts. It differs according to various body parts[78]. The measurement thickness of *Twacha* mentioned above is applicable for only thick skin on muscular parts of the body. It is not applicable for forehead and small fingers[79].

According to *Dalhana*, a commentator of *Sushruta Samhita*, twenty parts of 1 rice grain should be done and then thickness of *Twacha*should be determined e.g. *Avabhasini.*

*Twacha*is thick = 18/20 parts of 1 Vrihi[80] .

Table No. 3. Showing the comparison of thickness of *Twacha* according to Sushruta and Dalhana

Twacha	***Sushruta***	**Measurement (mm)**	***Dalhana***	**Measurement (mm)**
Avabhasini	1/18	0.055	18/20	0.90
Lohita	1/16	0.062	16/20	0.80
Shweta	1/12	0.083	12/20	0.60
Tamra	1/8	0.125	8/20	0.40
Vedini	1/5	0.200	5/20	0.20
Rohini	1	1	1	1
Mamsadhara	2	2	2	2
		Total:3.525 mm		**Total: 5.9 mm**

If practically observed, the thickness of 1 *Vrihi* is average 1mm. So, the thickness of *Twacha* told by *Sushruta* and *Dalhana* expressed in modern measured will be as per *Sushruta*, 3.5 mm and *Dalhana* appr. 6 mm.

If this measurement is compared with modern measurement of skin thickness which is 1.5 to 4 mm, then *Sushruta* seems to be perfect and more accurate in telling thickness of skin. Because according to *Dalhana*, it becomes 6 mm which is highly impossible.

Panchabhoutikatva of Twak:

All the structures of the body are having *Panchabhoutika* constitution, even on the cellular level. According to *Acharya Charaka, Pancha Gnynendriyas* are made up of *Panchamahabhuta*. The sense organs perceive the respective objects according to predominance of their constituent *Mahabhuta*. *Twak* has been predominance of *Vayu Prithvi*[81]. According to *Vagbhata Twak* is *Vayu* predominant organ[82].

Table No.4. Showing the relation between *Twacha* and *Panchamahabhuta*.

Element	**Structure**
Parthiva	*Kesha, Loma, Nakha*
Aapya	*Rasa, Lasiak*
Tejas	*Kanti, Varna*
Vayviya	*Sparsha, Samvedna*
Akashiya	*Lomakoopa, SwedaVahi Nalika*

Twak as Matruja Avayava:

Acharya Charaka has considered *Twak* as one of the *Matruja Avayavas*[83].

Twakas Indriya

Indriya is the source of obtaining the knowledge & performing actions. These are in the *Sookshma* form present in some specific places of the body, which are known as *Indriya Adhisthana*. *Karna Twak, Netra, Jihwa* & *Nasa* are the *Panchendriyas*[84]. The *Indriya* which is responsible for reception of touch sense is *Sparshanendriya*.

Susrutacharya also considers *Twak* as one of the Gyanendriya[85].

***Twacha* as a *Gyanendriya*:**

Human body is made up of *Pancha Gyanendriya* and *Panch Karmendriya.* Ear, Skin, Eyes, Tongue and Nose are five sense organs according to Ayurveda[86]. These organs are the abodes of their respective Indriyas[87]. *Twacha* is one of *Gyanednriyas* which is *Vayaviya* in nature[88].

The *Indriya*, which is responsible for reception of touch sense is *Sparshnendriya* and *Twacha* is its abode (i.e. *Adhishthana*)[89]

The important property of Vayu is *Sparsha Guna* and its reception through *Sparshanendriya* to enable all the movements in the body to bring lightness to body and to create impulses in body[90].

In all *Indriyas*, *Sparshanendriya* is an entity that occupies all other *Indriyas*, *Manas* is also intimately related to *Twacha* as it is also all encompassing as well as *Twacha* occupies the whole body[91].

Prithvi, *Jala*, *Teja* and *Vayu* are characterized by *Kharatva* (roughness), *Dravatva* (Liquidity), *Chalatva* (mobility) and *Apratighata* (Un obstructibility) respectively. All these attributes are perceived by tactile sense organ. Touch together with its absence is Perceived by tactile sense organ[92].

Twak*in relation with *Dosha

- **VataDosha:**

*Vagbhata*says *Twacha* is one of the *Sthana* of *Vatadosha*. Out of five types or *Vata*, especially *Prana* and *Udana* are directly related to *Twacha*. *Pranavayu* is responsible for the tactile sensation. *Twacha* is able to perceive sensations like cold, heat, roughness, smoothness with the help of *Pranavayu* itself[93]

The other type of *Vata* i.e. *Udana Vayu* produces *Varna* and if it gets vitiated then there is discolouration of skin[94].

- **PittaDosha**

*Twak*is considered as one of the *Pitta Sthanas*[95].*Pitta* residing in the *Twak* is *Bhrajaka Pitta* & is responsible for digestion & absorption and also it helps in expression of *Varna* of the *Twak* & enables the digestion & utilization of substances usedthrough *Abhyanga*, *Parisheka*, *Avagaha* etc. It indicates the glow of one's natural complexion[96].

Charakacharya said that the production of normal & abnormal color of the *Twak* is belongs to the *Pitta Dosha*.

Acharya Vagbhata observes that, *Bhrajaka Pitta* situated in the *Twak* imparts the luster & radiance of the twak[97].

Chakrapani comments on the context as the regulation ofthe body heat &variations in the colour of the *Twak* as the functions of the *Bhrajaka Pitta*[98].

- **KaphaDosha:**

One of the *Gunas* of *Kapha* is *Snigdha* due to this *Guna* of *Kapha*, moistness and oily nature of *Twacha* is maintained. In *Kshaya* of *Kapha Dhatu*, then *Snigdha Guna* decreases and due to this *Twacha* becomes dry and cracky in nature.

***Twacha*&*Saptadhatu*relation:**

There is a very close relation between *Saptadatus* and *Twacha*.

- **Rasa**

At several places *Twak* has been used in conjecture of *Rasa Dhatu* like *Twak Sara Purusha*. *Twacha*is a huge structure and it requires nourishment of *Rasadhatu* for its well beings.

- **Rakta**

Raktadhatu is present in *Raktavahi Dhamnis*. *Twacha* is richly supplied by *Raktadhatu* and also called as *Asrukdhara*.

- **Mamsa**

Twacha is the *Moolasthana* of *Mamsavaha Srotasa*. *Vasa* and *Shat Twacha* are generated from the *Mamsa* itself. So that *Mamsa Dhatu* and *Twacha* are intimately related to each other.

- **Meda**

The *Mala* of *Meda Dhatu* is *Sweda* and *Sweda* is expelled out of the body through *Twacha* and in this way is related.

- **Asthi**

The *Kitta* of *Asthi* are *Kesha* and *Loma* which emerge out from *Twacha*.

- **Majja**

Mala of *Majja* is Sneha of *Netra*, Purisha and *Twacha*.

***Twak*as *Mala* of *Medodhatu*:**

In *Charaka Chikitsasthana*, it is referred that *Twak* is the mala of *Medodhatu*. *Twacha* is mainly related to *Sweda*. *Twacha* is having innumerable *Bahirmukha Sukshma Chidra* through which *Sweda* is excreted out of the body. Thus *Twacha* acts as biggest *Malayana* of body. Decrease in amount of *Sweda* causes hair loss, loss of sensation and cracks in the skin[99].

***Twacha* & *Upadhatu* Relation:**

All *Dhatus* have their own *Upadhatus, Vasa and* Shat – *Twacha* are *Upadhatu* of *Mamsadhatu*[100].

***Twacha* & *Srotasa* Relation:**

Twacha is closely related to *Swedavaha Srotasa* and *Mamsavaha Srotasa*.

- **Swedawaha Srotasa:**

Meda and *Lomakoopa* are the roots of Swedavaha *Srotasa* out of which *Lomakoopa* are present in the skin in the form of numerous openings. Also *Twacha* acts as a medium for evapouration of *Sweda* outside the body[101].

- **MamsavahaSrotasa:**

According to *Sushruta* and *Charaka*, *Snayu* and *Twacha* are the roots of *Mamsavaha Srotasa*[102]. The *Viddha Laxana* of *Mamsavaha Srotas* leads to *Swayathu, Mamsa Shotha, Siragranthi* and even *Marana*.

***Twacha* & *Sarata* Relation:**

Sara means the essence part of the respective *Dhatu*. Each *Dhatu* has its *Sara* and in the person having *Sarata*of particular *Dhatu*, there are all good characters of that *Dhatu*. In case of *Twacha, Rasasara*is considered as *Twaksara*. As *Rasadhatu* is spread all over the Twacha. *Rasasara* is considered as *Twaksara*[103].

Twaksara person have a fresh, lustrous, smooth skin with deep routed and tender

hair[104]. According to *Charaka*, *Twaksara* person is having unctuous smooth, soft, clear, fine, less numerous, deep routed and tender hair[105].

***Twacha* & *Rogamarga* Relation:**

There are three types of *Rogamarga* as *Shakha*, *Marma*, *Asthi*, *Sandhi* and *Koshtha*. *Twacha* is included in *Shakha Roga Marga* along with *Rakta* and other *Dhatus*. This comes in *Bahya Rogamarga106*.

***Twacha* & *Prakruti* Relation:**

- **Vata Prakruti:**

Persons having *Vata Prakruti* have *Ruksha*, *Khara Twacha* and are of *Sheeta Sparsha*. It is blackish in colour and almost having no sweat or less sweat.

- **Pitta Prakruti**

Persons of *Pitta Prakruti* have fair or yellowish *Twacha* having *Ushna Sparsha* and there is profuse sweating from the skin with bad odour.

- **Kapha Prakruti**

People having *Kapha Prakruti* have soft, white (*Gaura*) and oily skin.

Twakas Vranavastu

Acharya Charaka has given *Twak* an important place in *Ashta Vrana Vasthus*[107].

Varna* of *Twak

Susrutacharya opines that *Tejas* is the causative factor of complexion at the time of conception. When *Tejas* is associated with *Aap Dhatu* it results in fair complexioned child & with *Prithvi*, *Krishna Varna* occurs. *Tejas* alongwith *Prithvi* & *Akasha* causes Krishna *Shyama Varna* & with *Aap* & *Akasa* causes *Gaura Shyama Varna*[108].

Acharya Harita mentioned that the predominance of *Vata*at the time of conception causes *Syama Varna*, *Pitta* causes *Gaura Varna*, *Kapha* causes *Snigdha*

Shyama Varna for *Krishna Varna*. *Vata* & *Rakta* & for *Pingala Varna Pitta* &*Rakta* predominance is seen[109].

The colour of the skin depends on deeds of previous life & also on *Panchmahabhuta* predominance. *Teja* predominantly associated with *Aap* & *Akash* gives rise to *Gaura Varna* and that with *Prithvi* & *Vayu* causes *Krishna Varna* while the combination of these in equal proportion causes *Syama Varna* in fetus[110].

In the context *Chaya* & *Prabha*, *Acharya Charaka* explains in *Indriyasthana* as the *Chaya* circumscribes the complexion of the body, where as *Prabha* illuminates the Complexion[111] .*Bhrajaka Pitta* situated in the *Twak* imparts the luster & radiance of *Twak*[112].*Rakta Dhatu* imparts the colour to the *Twak* & *Mamsapusti* i.e. nourishes the *Mamsadhatu* in the body[113].

Twak in Doshadusti

Vagbhatacharya says that *Vata* when increased produces black discoloration, impairment of sensory functions[114]. *Pitta when* increased causes yellow[115] *Kapha causes* whitish discoloration of skin. In *Pitta Kshaya* there will be loss of *Prabha*[116].

In *Udararoga*

There will be visible veins (*Balinasho Jathare*) on the abdomen region in the *Purvarupa* of *Udara*[117].

In the context of *Pandu* &*Kamala*

There will be discoloration of the *Twak* ranging from *Pandu*, *Haridra* & *Haritha Varna* which *Pandu Varna* is the predominant colour. There will be roughness of skin & absence of sweating. In *Kamala*, face, nails etc will occur yellow colour[118].

In the context of *Poorvaroopa* of *Kushtha*

The skin becomes rough with excess or absence of sweat. There will be prickingpain, itching and loss of sensation[119]

In the context of *Vicharchika*

Acharya Sushruta explains that, there will be increased itching sensation Skin becomes rough & there will be cracked lines in the hands and feet[120].

3. INTEGUMENTARY SYSTEM

The skin is a largest organ in the human body in surface area & weight. It is the general covering of the entire external surface of the body including external auditory meatus & the outer surface of tympanic membrane. It contains the peripheral sensory nerve endings. The human skin shows wide regional variation in structure like scalp, face, palms & soles etc.

Types of skin[121]:

- **Hairy skin/hirsute/thin skin**: This type of skin will be hairy with sebaceous glands. Here the epidermal layers are thin, Stratum spinosum & granulosum is usually identifiable but Stratum corneum is thinner & stratum lucidum is usually lacking. The contour of the dermo epidermal junction is less than that of thickskin.

- **Non hairy/Thick skin :** Thick skin requires number of sweat glands for sustained cooling activity. Their keratinized layer is thicker but lacks of sebaceous glands. The non hairy skin areas are palm, soles,etc.

Surface irregularities of skin[122]:

The skin is marked by three types of surface irregularities – The tension lines, the flexure lines, & papillary ridges.

- **Tensionlines:**

These are the network of linear furrows which divide the surface in to polygonal shaped areas; these some extent corresponds to variations in the pattern of fibers in the dermis.

- F**lexure lines**:

These are permanent lines along which the skin folds during habitual movements of the joints. The skin is thin along these lines& firmly bounds to the deep fascia, these lines are prominent opposite the flexure lines of the joints, particularly on the palms, soles &digits.

- **Papillary ridges** :

These are confined to palms, soles & their digits. They forms narrow ridges separated by fine parallel grooves, they correspond to patterns of dermalpapillae.

Three major patterns in the human finger prints include loops, whorls & arches. The pattern of papillary ridges particularly those of fingers &thumb are morphologically stable throughout the life & different in differentindividuals.

HISTOLOGY OF NORMAL SKIN:

The skin is composed of three distinct layers,

1. Epidermis,
2. Dermis,&
3. Hypodermis.

Epidermis:

It is the outermost layer of the skin, in the most of the regions of the body epidermis is varies in the thickness, from about 0.04 mm on the eyelid to 1.6 mm on the palms with an average thickness of less than 0.17mm in most areas except for those areas chronically exposed to pressure &friction.

Epidermis is composed of keratinized Stratified squamous epithelium, highly impermeable to water & has high capacity for degeneration after damage. It has no vascular supply of its own & for its nourishment it has to depend on dermis.

Epidermis is structurally formed by a superficial cornified zone & a deep germinative layer. In the germinative layer new cells are constantly being reproduced, & they push older cells to the surface. As the skin cells move away from their source of nourishment, they become flatten & shrink, lose their nuclei. As they move from germinative layer to horny layer they turn into a lifeless protein called Keratin, after

serving abrief protective function, the keratinocytes are imperceptibly sloughed off. This process of living cells evolution called keratinization takes about four weeks[123].

Cells of epidermis:

Epidermis is formed by two main types of cells, Keratinocytes & dendritic cells. Dendritic cells of epidermis are Melanocytes, Langerhans cells & Merkel cells.

- **Keratinocytes:**

90% of epidermal cells are keratinocytes & are held together by desmosomes. They produce a protein called keratin; these substances helps water proofing thereby protecting the skin & concerned tissues from light, heat and microbes. Keratin consists of more than 40 insoluble proteins that serve as units for the formation of intermediate filamentpolymers, the later constituting a major network in the cytoplasm of keratocytes[124].

Keratinocytes possess intercellular bridges & ample amount of stainable cytoplasm. The major proliferative population of keratocytes is housed in the lowest part of the viable epidermis. The proliferative compartment that is the two lower rows of keratocytes in a normal epidermis has a cell cycle of 13 days, the renewal time of normal epidermis has been estimated to be about 26 days, divided approximately as 13 days time it takes viable keratocytes to travel from the base of the epidermis to the cornified layer, & another 13days for the time it takes dead keratocytes to be shed at last[125].

Melanocytes :

Melanocytes are dendritic cells & produce pigment melanin, which is responsible for skin colour& absorb UV light & shield the genetic material from damaging by UV .The ratio of Melanocytes in the basal layer of epidermis varies from 1:4 to 1:10 depending on the region of body.

Melanocytes posses long slender projections called dendrites extend between keratinocytes. Vescicles containing multiple melanosomes are pinched off from the tips of melanocyte dendrites & transfer granules of melanin to keratinocytes. Due to this transfer melanocytes may contain less melanin then keratinocytes. The difference in skin

colour is mainly due to difference in type & amount of skin colour from sunlight is due to the rapid movement of melanin into keratinocytes & also due to additional melanin synthesis by UVLight[126].

There are two classes of integumentary melanin. Eumelan in produced in ellipsoidal melanosomes (Eumelanosomes) account for the brown and black colours of both skinandhair. Pheomelanin, produced in perikal melanosomes (pheomelanosome) account for the lighter colour of hair, ranging from yellow to reddish brown.

It is the amount of melanin in Keratinocytes that determines the degree of pigmentation of skin and hair. The principle function of melanin is to protect the skin from the harmful effect of sunshine by scattering and absorbing ultraviolet.

Langerhans cells:

Langerhans cells were first described by Paul Langerhans in 1868. although this cell constitute about 4% of the cell population of epidermis, regional variation occurs in their distribution their number varying between 460 and 1000 per (mm)sq of epidermis.

Langerhans cells are stellete in forms & contain small membrane bounded granules of unusual shape called Birbeck granules. Its nucleus is irregular & lack bundles of keratin desmosomes are also absent.

These cells are similar to that of 'T' lymphocytes & macrophages & participate in the immune response of the body. They also occur in other stratified squamous epithelium including those of oral cavity, esophagus & vagina[127].

The cross sectional appearance of langerhans cells granules is like in shape of tennis racket.

Merkel cells:

In 1875 Fried rich merkel identified unique cells of the basis of epidermal rate ridges that were in contact with nerves fibrils. He named cells as "TOUCH CELLS"

They are more abundant in areas such as finger tips which has important role in sensory reception. The naked terminals of mylinated afferent nerves end in opposition to these cells forming merkel cell neurite complexes. Merkel cells are non pigmented

dedrosides cytoplasmic dense core granules, and also interact with separates T cells in assisting with immune response. Endothelial cells are not found since the epidermis lack of blood vessels. Nutrient delivery and waste transport are by diffusion. There are capillary networks in the papillary dermis which provide this function[128].

The names of 5 layers of epidermis from deepest to the most superficial are[129]:

(1) Stratum basale:

This layer is also called stratum germinativum to indicate its role in germinating new cells. This single layer of cuboidal to columnar shaped cells contains stem cells. Which are capable of continued cell division & melanocytes.

The stem cells multiply, producing Keratinocytes which push up towards the surface & become part of more superficial layers. The nuclei of Keratinocytes degenerate & die. Eventually, the cell remnants are shed from the surface layer of epidermis. During embryological development, other stem cells are migrating into the dermis & give rise to sweat & oil glands & hair follicles. The stratum basale also contain tactile cells (merkel cells) that are sensitive to touch.

(2) Stratum spinosum:

This layer contains of prickle cells, it lies above the basal layer & contains 8- 10 closely fitted rows of polyhedral cells. Cells of this layer connected each other by spine like protoplasmic projections. This is composed of several layers of polyhedral cells. They contain the precursors of the epidermal lipids in the form of disk like lipid bilayer membranes. A prominent feature of these cells is the presence bundles of keratin filaments that radiate from the perinuclear region & end in numerous desmosomes along the boundary between the adjacent cells.

(3) Stratumgranulosum:

This layer is also known as granular layer. It comprises 3 to 4 layers of flattened cells. That develops darkly staining granules of a substance called keratohyline. In this layer, keratin & water proofing protein is produced. In the stratum granulosum, the cells appears in various stages of degeneration & as a rule, break down & cell death occurs. They do not have limiting membranes and may be incorporated in there periphery.

(4) Stratumlucidum:

This is clear layer as it is highly refractive it is found in thick palmo-planter skin composed of closely packed cells in which traces of flattened nuclei may be found. It consists of 3-5 layers of translucent, flat and dead cells. They hold droplets intermediate substance eledin, which is eventually transformed to keratin this is a translucent, thin layer of cells.

(5) Stratumchorneum:

It is known as horny layer. It is uppermost layer of epidermis. It consists of several layers of horny, epithelial cells, in which no nuclei are discernable & their protoplasm has been converted into a material known as keratin. The outer most cells containing the tough protein keratin are known as Keratinocytes. They consist of 25- 30 rows of dead flat cells. The cells are continuously shed & replaced by the newly divided cells.The stratum chorneum serves as an effective barrier against light, heat, bacteria & many chemicals.

Dermis:

It is a second inner layer of the skin. The dermis comprises of connective tissue enclosing collagen, elastic fibres & ground substance, in which nerve, blood vessels, lymph vessels, muscles & sebaceous apocrine and ecrine sweat units are embedded. The mature dermis also contains a variety of cells scattered freely such as macrophages, fibroblasts, mast cells, histocytes, langerhans cells, lymphocytes & very rarely esinophils. Plasma cells are not seen in normal dermis anywhere except muco- cutaneousjunction.

The corium is highly tough flexible & highly elastic, it is very thick in the palms & soles, thicker on the posterior than on the anterior aspect of body & on lateral than on medial side of limbs. It is exceedingly thin & delicate in the eye lids, scrotum & penis. Besides elastic fibers & collagen, the dermis contains the extra fibrilar matrix, which is extra cellular & composed of a complex mixture of proteoglycan, glycoproteins, glycosaminoglycans, water & hyaluronic acid. The most significant glycosaminoglycans, which bind proteins to form the protioglycans of the skin, or chondroitin sulphate, dermatin sulphate, keratin suphate, heparinsulphate, heparin, versican & perlecan .These are involved in assuring the tightness of skin. It is derived from the mesoderm & its

thickness is varying from 2-4 mm. Dermis is vascularised & innervated. It is composed of connective tissue containing collagenous & elastic fibers, which provides strength & elasticity to the dermis.

The fully formed dermis may be divided into 2 components.

(1) A thin adventitial dermis, which is the combination of papillary dermis & peri adnexaldermis.

(2) A larger component reticular dermis.

Papillary layer:

This is immediately deep to the epidermis. It forms about $1/5^{th}$of total dermis. It comprises of loose areolar connective tissue having fine elastic fibers providing strength and elasticity to overlying tissue.

Its superficial surface displays small finger like projections termed as dermal papillae. These papillae move into the epidermis. They may contain loops of capillaries, tactile receptors or nerve endings which are sensitive to touch .Dermal papillae of the thick skin causes ridges in the overlying epidermis[130].

Reticular layer:

This is the deep aspect of the papillary layer. It consists of thick, irregular connective tissue containing intertwining collection (in shape of bundle) of collagen fibers arranged in an orthogonal pattern. The reticular fibers are special type of very thin collagen fibers, & are found entwined among collagen bundles. In histopathological sections they appear fragmented; spaces between fibers are occupied by hair follicles, nerves, oil glands, ducts of sweat glands & a small amount of adipose tissue. The combination of collagen&elastic fibers in the reticular layer allows strength & flexibility in every direction[131].

Dermo-epidermal junction:

The interphase between the dermis & epidermis & also epidermal appendages' forms dermo-epidermal junction. It can be divided into 4 zones. First one is epidermal portion which includes intermediate filaments hemidesmosal plaques & plasma membrane of basal keratinocytes. Basal portion of Lamina Lucida is the second layer which is electrolucent & the electron dense zone called lamina densa is the third layer

which lies parallel & contiguous to lamina lucida. It is composed of type 4 collagen fibers& other antigenic components. The fourth zone is Sub lamina densa, it have the curved structure, the anchoring fibrils whose one end is attached to lamina dense & the other end to the papillary dermis. Each of these zones has specific structures, biochemical composition & functional properties[132].

Hypodermis:

The hypodermis is the innermost layer of the skin. It attaches with the reticular layer of the dermis to underlying organs such as bone & muscle. It is composed of type of cells specialized in accumulating & storing fats, known as adipocytes. The hypodermis acts as an energy reservoir. The fat which is accumulated in the adipocytes can be put back into the circulation by venous route .When there is lack of energy providing substance to the body then they convert into energy. The hypodermis passively participate in thermoregulation since fat is a heat insulator. The hypodermis is distributed all over the body but it has a tendency to accumulate over the abdomen & shoulders in men, & below the waist, around the thighs, hips & buttocks in women. The hypodermis contains loosely arranged elastic fibers, fibrous bands anchoring the skin to the deep fascia & fat, exceptinthe eyelids, penis, scrotum, nipple & areola[133].

Appendages of skin:

Skin has different types of appendages, principally hairs, sebaceous glands, sweat glands & nails which are derived from surface epithelium.

***Hair* –** These are highly modified keratinized structures produced by hair follicles which are essentially cylindrical down growths of surface epithelium ensheathed by collagenous tissue. Each hair has a medulla, cortex, and cuticle. The medulla in the centre contains softkeratin and air. The cortex, the innermost thickest layer, has the pigment that gives hair color. The cuticle, the outermost layer, has cells that overlap like scales. Both the cuticle and cortex have hard keratin.

The hair root in a hair follicle is embedded beneath the skin. The hair shaft protrudes from the skin. Hair sheds and is replaced constantly during growth and rest phases. Hair has a protective function, eyebrows keep sweat from running into the eyes, nose and ear hairs filter dust from the air, and scalp hairs protect against abrasion and overexposure to sun rays.

In addition to generating the hair shaft, the hair follicle provides a protective niche to several stem cell populations in the skin, including keratinocyte stem cells, melanocyte stem cells, a population of epidermal neural crest stem cells, and the dermal stem cell compartment, known as the dermal papilla. These stem cells are required most visibly during wound healing.

Hair follicles extend into the dermis; the deep ends expanded parts are called hair bulbs. A papilla protrudes into the hair bulb and provides nutrients for the growing hair. The hair follicle walls have an inner epithelial root sheath and an outer dermal root sheath. The epithelial root sheath has an inner and an outer layer that thins as it approaches the hair bulb. It becomes the matrix, the actively growing part of the hair bulb that produces the hair. Arrector pili muscles are smooth muscle cells attached to hair follicles. When they contract, they pull the hair into an upright position, causing skin dimples (goose bumps).The sympathetic nervous system regulates these muscles cold temperatures or fright can activate them[134].

Nails – These are flattened elastic structures of a horny texture placed on the distal parts of the dorsal surfaces of the fingers and toes. The nail is divided into six specific parts - the root, nail bed, nail plate, eponychium (cuticle), perionychium, and hyponychium.

The root of the fingernail (germinal matrix) is underlying the skin and behind the fingernail. It continues quite a few millimeters into the finger. The fingernail root makes for most of the quantity of the nail and the nail bed. This portion of the nail is devoid of Melanocytes. The boundary of the germinal matrix is seen as white, crescent shaped lunula.

The nail bed is present from the border of the germinal matrix to the hyponychium. The nail bed comprises of the blood vessels, nerves, and melanocytes. Since the nail is produced by the root, it continues along the nail bed. It contributes matter to the underlying part of the nail making it thicker. The nail bed should be even. If the nail bed is not smooth, the nail crack or develop grooves which is cosmetically unpleasant.

The nail plate is the actual fingernail, made of translucent keratin. The pink appearance of the nail comes from the blood vessels underneath the nail. The underneath surface of the nail plate has grooves along the length of the nail that help anchor it to the

nail bed.

Eponychium is the cuticle of the fingernail. The cuticle is situated between the skin of the finger and the nail plate fusing these structures together and providing a waterproof barrier. The perioncyhiumis the skin that overlies the nail plate on its sides. The perionychium is the site of hangnails, ingrown nails, and an infection of the skin called paronychia. The hyponychium is the area between the nail plate and the fingertip. It is the junction between the freeedge of the nail and the skin of the fingertip, also providing a waterproof barrier[135].

Sweat Glands- They occur in almost every part of the skin. There are two kinds of sweat glands which differ greatly in both the composition of the sweat and its purpose.

Eccerine sweat glands are exocrine glands distributed over the entire body surface but are particularly abundant on the palms of hands, soles of feet, and on the forehead. Each consists of a single tube, the deep part of which is coiled into an oval or spherical ball which is situated in the deeper layers of corium or in subcutaneous tissue. These are merocrine in nature as they produce sweat that is composed chiefly of water with various salts without demonstrable cell disintegration.

The primary function is body temperature regulation. The sweat glands are controlled by sympathetic cholinergic nerves which are controlled by a center in the hypothalamus. The hypothalamus senses core temperature directly, and also has input from temperature receptors in the skin and modifies the sweat output, along with other thermo regulatory processes[136].

Apocrine glands- They are mainly present in the armpits, eyelids, areola nipple of breast and around the genital area. They are larger than eccerine sweat glands and produce thick secretion. In females they show involution changes related to each menstrual cycle. They are developed in close association with hairs and their ducts typically open into the distal end of hair follicles. The secretion of glands varies with their anatomical position .In some areas of the body, these sweat glands are modified to produce wholly different secretions, including the cerumen of the outer ear. Mammary glands are apocrine glands modified to produce milk[137].

Sebaceous Glands- They are small sacculated glands lodged in the substance of dermis,

they occur in most parts of the dermis especially in scalp, face, apertures of ear, nose, mouth and anus but absent in palms of hands and soles of feet.

Each gland consists of a single duct which emerges from a cluster of oval or piriform alveoli .Each alveolus is composed of a basement membrane enclosing a number of epithelial cells. Outer cells are continuous with the cells lining the duct. The remainder is filled with larger cells containing fat, but in the centre the cells are broken up leaving a cavity filled with their debris and a mass of fatty matter, which constitutes sebum cutaneum.

As the sebaceous glands produce their secretion by complete fatty degeneration of their central cells they are classed as holocrine glands. Ducts open most frequently into hair follicles. It also opens into general surface as in labia minora, glans penis and margins of lips .Sebum acts as a lubricant of the hair and skin protecting skin from the effect of moisture or dessication and hairs from becoming brittle. It also has some bactericidal action. Its secretory activity is controlled by hormones particularlyandrogens[138].

Embryology of skin[139]:

The skin is derived from three diverse components.

(a) The epidermis is derived from the surface ectoderm. This is at first single layered; the ectoderm cells proliferate to give rise to typical stratified squamous epithelium. Many of superficial layers are shed off. These get mixed up with secretions of sebaceous glands to form a whitish sticky substance (vernix caseosa) which covers the skin of the newborn infant.

(b) Epidermal ridges develop between the third & fifth months of fetalage

(c) Soon, there after characteristic patterns (whirlsloop & arch) are formed on the tips of fingers & toes. The patterns are genetically determined & are different for eachperson.

(d) Melanoblasts of the epidermis are derived from the neuralcrest. Cells of Markel & Langerhans appear in the epidermis between 8 & 12 weeks of intrauterinelife.

(e) The dermis is formed by condensation & differentiation of mesenchyme underlying the surface ectoderm. This mesenchyme is believed to be derived from the

dermatome of somites.

(f) Nails –develop from the surfaceectoderm.

(g) Hair –also derived from surfaceectoderm.

(h) Sebaceous gland-is formed as a bud arising from ectodermcells.

(i) Sweat gland –develop as a down growth from the epidermis, first it was solid later canalized. The lower end of the down growth becomes coiled & forms the secretary part of thegland.

Blood supply of skin[140]:

Blood enters the skin from the underlying muscles & sub cutis via small perforating arterioles which form an anastomosing horizontal reticular plexus at the interface between cutis & dermis. From this plexus, some arterioles pass deeply to supply the adipose tissue, sweat glands & hair follicles.

The other arterioles pass superficially giving off anastomotic collaterals to glands &hair follicles & form a second major horizontal plexus, at the junction of the reticular & papillary dermis, the papillary plexus. Capillaries from this plexus loop into the dermal papillae. Usually one loop per papilla & the loops drain into a superficial venous plexus intertwined with the arteriolar papillary plexus. This venous plexus in turn drains into a flat intermediate plexus. The reticular layer further drains into a deeper plexus, receiving from capillary beds surrounding glands & hair follicles &is closely associated with the arteriolar plexus.

In the deeper layers of dermis arterio-venus anastomosis are common in glabrous skin, some of these are surrounded by thick sphincter like group of smooth muscle & pursue a convoluted course & are called glomera. These non striated muscle elements are under autonomic control. So heat exchange can be regulated by vasoconstriction of afferent arterioles of the general cutaneous supply. The arterio-venus anastomoses provide for a deep circulation in the skin under thermal conditions which might otherwise reduce blood supply of the skin to dangerous levels.

Lymphatic drainage of skin[141]:

Numerous lymphatic vessels terminate in the dermis & drain deeply first into a dermal network in the papillary layer & finally in to a network at the junction of dermis & superficial fascia. Deep to this zone the lymph flows through wider channels provided with valves into main lymphatic area. The lymphatic drainage of skin is quite profuse & free anastomosis appears to occur between vessels at all levels.

Innervations of skin[142]:

Skin is a major sensory surface & has a rich nerve supply by mylinated & non mylinated sensory nerve fibers of cerebrospinal & autonomic nerves.

Cutaneous nerves sense provides us with a wealth of information about the external environment & its interactions with the skin. The afferent and efferent nerve endings penetrate the superficial fascia & ramify through the reticular & papillary layers of the dermis. Conspicuous nerve plexuses are formed around hair follicles & in the papillary layer of dermis beneath the heat loss in epithelium.

An array of coetaneous receptors carries information concerning various stimuli, their duration & their spatial & temporal patterning. The highly branched mylinated & non mylinated free terminals which end within the dermis & lower layer of epidermis acts as an important sensory component. They may be mechano, chemo, thermo & nociceptors in all types of skin.

Colour of the skin[143]:

Melanin, carotene & hemoglobin are three pigments that give skin a wide verity of colors.The amount of pigment in the skin is determined by the amount of melanin being produced by the body. Cutaneous pigmentation is the outcome of two important events- the synthesis of melanin by melanocytes & the transfer of melanosomes to surrounding keratinocytes.

The number of melanocytes in human skin of all types is constant, but the number, size & the way in which the melanosomes are distributed within keratinocytes vary. The melanin content of human melanocytes is heterogeneous not only between the different skin types but also between different sites of the skin from the same individual. This

hetrogenicity is highly regulated by gene expression, which controls the overall activity & expression of melanosomal proteins within individual melanocytes. These distinct patterns of melanosome type & distribution are present at birth & and are not determined by external factors (sun exposure). They are responsible for the wide variety of skin complexion.

The epidermis consists of two types of cells melanocytes & keratinocytes. The skin colour of various races is determined mainly by the number of melanin contents & distribution of melanosomes produced & transferred by each melanocyte to a cluster of keratinocytes surrounding it.

The second main determinant of skin colour is the oxygenated hemoglobin of the dermal vascular bed particularly the superficial papillary plexus. These of course viewed through the overlying epidermis whose surface layer scatter reflect some of the light & is somewhat opalescent, giving well oxygenated skin a pink colour. Where less oxygenated blood is present a bluish hue results.

Skin colour is dependent on blood flow also varies with ambient temperature, exercise, emotional state, hemoglobin content of the blood & various other features often affected by general health.

The skin & the immune system[144]:

Skin provides protection from foreign invaders in several ways, apart from the physical barrier there are specialized cells of immune system. Some of these cells detect invasion by foreign proteins such as bacteria or viruses & other cells have the function of destroying & removing such materials.

When an antigen comes in contact with cells of the immune system these cells produce antibodies that fit around the invading antigen in a unique way. The antibody antigen combination is recognized by other cells within the immune system family, which then move & destroys the invader. In the type of immune reaction called mast cells, these contain powerful signaling chemicals such as histamine which, when released activate the other component of the immune system.

Histamine has marked local effect on the skin. At the contact site the skin swells &

become red ,due to opening up of the blood vessels & leakage in to the tissues from within the blood vessels & the lymphatic system surrounding the contact site of skin blood vessels contract restricting the flow of blood & so causing the skin to pale 'wheel & flare' reaction.

These usually act over longer time scales. In allergic contact dermatitis for example it takes two or three days for the immune system cells to recognize the presence of the irritation & to recruit more cells locally to deal with the situation. Such a delay makes it harder to work out what caused the allergic reaction in the first place.

The principle task of immune system is to protect the host by eliminating or neutralizing foreign molecules. The epidermis is a site of antigen entry & destruction. It also contains cells which participate in the initiation & regulation of immune response. These include psoriasis, cancer & eczema.

Specialized cells called langerhans cells present in the epidermis, present antigen to T lymphocytes & can initiate antigen specific immune responses. Keratinocytes are capable of secreting a wide verity of immunomodulating cytokines that can regulate many immune responses. T –cells are not usually present in the epidermis, arriving when mediated by langerhans cells & cytokines. The epidermis is a formidable barrier both physically & chemically. Its PH controls the presence & balance of microbes on its surface to further inhibit dangerous inhabitation.

Thermoregulation of the skin[145]:

The skin contributes to thermoregulation, the haemostatic regulation of body temperature, in two ways by liberating sweat at its surface and by adjusting the flow of blood in the dermis. In response to high environmental temperature or heat produced by exercise , the evaporation of sweat from the skin surface helps lower body temperature in response to low environmental temperature, production of sweat is decreased which helps conserve heat. During moderate exercise, the flow of blood through skin increases which increases the amount of heat radiated from the body.

The dermis houses an extensive network of blood vessels that carry 8- 10% of the total blood flow in a resting adult, for this reason the skin acts as a blood reservoir.

During very strenuous exercise, however skin blood vessels constrict somewhat,

diverting more blood to contracting the skeletal muscle & the heart. Because of this shunting of blood away from the skin, however, less heat is lost from the skin & body temperature tends to rise.

Skin in Different Ages[146]

Skin of the Neonate and Infants

Epidermal appendages and dermo-epidermal junction are anatomically fully developed in the full term neonate. The main difference between neonatal and adult skin is the presence of vernix caseosa and the structure of dermis. The total thickness of the dermis of the neonate is lesser than that in adult. The secretion of sebaceous glands contributes to Vernix caseosa. It dries rapidly and starts to flake off within a few hours after birth; this consists of lipids that may protect the skin from infection.

Skin and Menopause

There are no specific structural changes in the skin after menopause. But dry skin, thinning of the epidermis and dermis and loss of dermal elasticity may be occurring due to low circulating estrogen.

Skin in Old Age

The epidermis becomes thinner on non lightexposed sites with the passing of years. The permeability of the skin also changes with the age. The individual keratinocytes shrink with age. Blood vessels decrease in number but thicken with age. The main structural changes are observed in the dermis of aged skin. Dermal connective tissue loses much of its proteoglycan ground substance and collagen fibers become mainly tough, insoluble and heavily cross linked. The irregularity of pigmentation, sensory perception decreases and the threshold for pain increases withageing.

Skin and Pregnancy

During pregnancy alterations in the appearance of the skin are hyper pigmentation in areas which are already pigmented, particularly the nipples, areola, and genital areas. Dark areas appear symmetrically across the cheeks, around the eyes and forehead giving

a mask like appearance the chloasma or melasma. The nails often turn brittle. Striae gravidarum are commonly seen in this time.

Physiology of skin[147]:

1. Sensory - skin is sensory to touch, pain &temperature.
2. Regulation of body temperature - heat is lost through evaporation of sweat & heat is conserved by the fat &hair.
3. Absorption - oily substances are freely absorbed by theskin.
4. Secretion - skin secrets sweat &sebum.
5. Excretion - the excess of water, salts & waste products are excreted through thesweat.
6. Regulation of PH - a good amount of acid is excreted through thesweat.
7. Synthesis - in the skin vita-D is synthesized from ergestrol by the action of ultraviolet rays of thesun.
8. Storage - skin stores thechlorides.

(j) Reparative - the cuts & wounds of the skin are quickly healed

4. REVIEW OF *MANAS*

Manas is included in the nine *Dravyas* mentioned in *Charak Samhita –Kha* (*Aakash*) etc *Panchmahabhootas, Aatma, Manas, kaal* and *Disha*[148.] The factor by thehelp of which one obtains knowledge, comprehends, appreciates certain things is called *Manas. Manas* is also called *Satva*. Along with the *Aatma* it acts as a motivator and bearer for the body.

Manas Lakshana:

According to *Tarkasangraha*, the tool for appreciating happiness and distress is called *Manas*[149].Acharya Charak has clearly stated the role of *Manas* in obtaining knowledge. If *Manas is* not present in the sequence of *Aatma, Indriya* and *Vishay*, then knowledge is not obtained. Only in the presence of *Manas* knowledge is obtained[150].Philosophy or Darshan *Shastra also* emphasizes the importance of *Manas*. According to *Vaisheshik Darshan* the characteristic of *Manas* is actually the presence of knowledge[151].

According to *Nyaya Darshan* simultaneous occurrence of knowledge in all the sense organs is the quality of *Manas*[152].

Synonyms of *Manas*:

Acharya Charak has quoted three synonyms for *Manas- Atindriya, Satva, Chetas*[153]*. Chitta, Chetas, Hridaya, Swant, Hrud, Manas* and *Man* are the 7 synonyms quoted by *Amarkosha*[154]. Apart from this *Yoga-vashistha* has mentioned few other synonyms- *Buddhhi, Ahankar, Karma, Smruti, Kalpana, Vasana, Avidya, Mala, Maya, Prakruti, Jeev and Brahma.*

Manovaha Srotas:

Acharya Charak has explained this concept of *Manovaha Srotas* in the context of *Manas Vyadhi* namely *Unmada*[155]. The *Malas* (*Sharir* and *Manas Dosha*) located in the *Manovaha Srotas* of timid (*Alpa-Satva*) person vitiate the *Hridaya* situated in the *Buddhi* thus giving rise to mental disorders. Here *Manovaha Srotas* is understood to be spread throughout the body[156]. The *Manas* along with the sense organs virtually travel all over

the body supposedly starting from the heart. The *Dhamani* word is translated as the nerves associated with the sensations of *Shabd, Sparsha, Roopa*, *Rasa* and *Gandha*[157]. Also it is mentioned in *Indriya-Sthana* of *Charak Samhita* that at the time of death the *Manovaha Srotas*is completely vitiated by the *Doshas* which give rise to dreadful dreams[158].

Location of *Manas* in the body:

There are various theories regarding the abode of *Manas* in the body. From a broader aspect the abode of *Indriyas, Manas* and *Aatma* is described in the *Hridaya.* In the process of organogenesis in foetal life, the heart is formed first. This may be the reason that it is described as the location of the above three. According to *Aacharya Vagbhat* and *Charak*, the *Manas* along with its sense organs reside in theheart[159,160]. In one more reference *Acharya Charak* has quoted that the head is an organ which holds *Prana* and all the sense organs i.e. *Indriya. Manas* is also an *Indriya.* Hence its location may be considered as the *Shira*[161].According to *Acharya Bhel*, *Manas* is located in between the *Shira* and *Talu.* From this place it co-ordinates with the surrounding sense organs. Also as *Manovaha Srotas* is spread throughout the body, according to some *Manas* resides throughout the body[162].

Characteristics of *Manas:*

As quoted by *Acharya Charak, Anu* (minuscule) and *Ek* (single) are the two characteristics of *Manas*[163].*Manas* are in a *Sukshma* form in the body. Like *Aatma*it is not present throughout at all times. Being miniature its movement is extremely rapid, so as to nullify even the measurement of time. It can travel from one subject *(Vishaya)* to another speedily. Also it is singular. If we consider that there are multiple *Manas*, then it would have been possible that simultaneously we can gather knowledge from all our senses, which is not true. *Manas* can bind with one sense organ and their related subject at one time to gather knowledge. If it tries to bind with more than one sense organ simultaneously, there will be imperfect knowledge.

Vishaya of Manas:

*Acharya Charak*in *Sharir-Sthana* has mentioned the objects (*Vishaya*) of the mind. *Chintyam* (thinking), *Vicharyam* (analysis), *Uhyam* (reasoning), *Dheyam* (concentration), *Sankalpam* (determination), happiness, sadness etc are the factors related with *Manas*[164]. *Chintyam* includes the process of deciding the right and wrong things. *Vicharyam* includes the analysis of the good or bad consequences of the action. *Uhyam* is to settle on a decision to do a certain thing. *Dheyam* is deciding to the thing. *Sankalpa* is the determination whether the action will be beneficial or not.

Functions of *Manas*:

The functions of *Manas* include control of sense organs, control over self, reasoning and thinking or analysis. The *Manas* exerts its control over the ten *Indriyas* (*Dyanendriyas*and *Karmendriyas*). They are motivated to engage in their focus (*Vishaya*) due to the inspiration of *Manas*[165]. It is located in the *Indriyas* to keep them motivated but at the same time refraining them from detrimental things. *Manas* is wavering and never stable. Due to this function of *Swasya-Nigraha*, it refrains own-self from unsteadiness and keeps itself away from attaching to *Vishaya*. It helps the *Manas* to engage itself in beneficial subjects and refrain from unfavorable things. This is also called *Dhruti*, one of the types of *Pradnya*. *Dhruti* abstains the *Manas* from greediness (*Lolupta*). One more function of *Manas* is *Uhya* i.e. manifestation of *Vishaya*with the help of sense organs. The analysis of good (beneficial) and bad (harmful) is also done by*Manas*.

It is always interesting to probe into the mystery of *Manas* (mind). The workers in the field of applied science like psychology and psychiatry are trying to trace out the mystic nature of it. The dispute of mind versus matter or body had been very prominent in the west. The superiority of one on the other, or the very existence of the either of the two has been questioned by the opposite camps. Some materialistic belong to the school, which never believed in the existence of matter like *Manas* or soul.

The supporters of western spiritualistic school are not prepared to accept the independent existence of the materialistic world. So, we find both extremes in the western philosophy.

Besides a few, all-Indian schools have universally ascribed the existence of the

three factors viz. *Atman*, *Manas* and *Bhutatmaka Sharira*. *Charaka*says that *Manas* is one of the nine *Dravya*[166]. *Ubhayatmaka* and *Atindriya Manas* is *Achetana* but *Kriyavana*[167]. After *Sannikarsha* of *Atman*, *Indriya* and *Artha*, the man factor whose presence or absence determines the *Jnanotpatti*that is Manas[168]. It has two *Gunas*- *Anuttava* and *Ekattava*; two *Doshas*- *Rajas* and *Tamas*[169]; three types – *Shuddha* (*Sattavaika*), *Rajasika* and *Tamasika*[170].

Sixteen types of *Manas Prakriti* are described on the basis of types of *Manas*. It may be said that *Rajasika* and *Tamasika Prakrites* are more prone to psychosomatic disorders due to excess of *Rosha Ansha* and *Moha Ansha* respectively[171]. In the same way in *Sharirika Prakrities Paittika* and *Vatika Prakriti* are more prone to psychosomatic disorders as their *Manas* is easily affected by *Krodha*, *Kshobha* etc. in comparison to *Kaphaja Prakriti* whose *Manas* is not affected or affected minimally or after a long duration by these *Bhavas*[172.]

Chinta (anxiety), *Krodha* (anger), *Shoka* (grief), *Bhaya* (fear), *Harsha* (happiness), *Vishada* (depression), *Irshya* (hate), *Kama* (lust), *Lobha* (greed) etc. are described as *Manas Bhava* by *Acharya Bharata* in '*Natya Shastra'* . These *Bhavas* are also known as '*Sthayi Bhava'* there. With these *Bhavas* other short term *Bhavas* also originate and they are known as '*Vyabhichari Bhava'*. They affect our body and produce some changes, which are called as '*Anu Bhava'*.

These emotional feelings /*Bhavas* when become prominent then are known as *Vegas*(urges). It is said by *Charaka* in '*Na Vegandharaniya Adhyaya'* that these natural urges should be controlled[173], They are also called as *Manasika Vikaras* of two *Manas Doshas*. The *Prajnaparadha* is the cause of above-mentioned emotional disorders[174]. They are the symptoms of many diseases, cause of so many diseases and also the diseases themselves. A little description is found in Ayurvedic texts about the details of these diseases, although these emotional disturbances are regarded as important mental disorders of *Manas*. However, we find that ancient Indian literature these factors have been greatly stressed. Emotions and their bodily expressions:

As a science, psychosomatic medicine aims at discovering the precise nature of the relationship of the emotions and bodily functions. To a certain degree every emotion

finds some bodily expressions. The individual will show his emotions in some visible form, perhaps in is posture and attitude, perhaps in his face, perhaps in the trembling of his legs and knees.

Similar changes could be found in the organ themselves, e.g. if he flushes or turns pale, circulation of the blood is affected. In anger, anxiety, sorrow or any other emotion, the body always speaks, and each individual's body speaks in a language of its own. The emotions and their physical expressions tell us how the mind is acting and reacting in a situation, which it interprets as favorable or unfavorable.

A few emotions are described as follows:

1. *Krodha* (anger):

Anger is generally seen in *Rakshasa*, *Danava*and *Uddhata* personalities and that seems to be one of the causes of fight. The anger influences the organs, mobilizes them for actions or lays an additional stress on them. Some people, when they are angry, have stomach trouble at the same time, or grow red in the face. Their circulation is altered to such a degree that a headache ensues. We shall generally find un-admitted rage and humiliation behind attacks of Urticarial lesions, generalized pruritis etc. and symptoms like the flushing of eyes, sweating and violence.

According to *Ayurveda*, the degree of anger can be measured on the basisofintensity of '*Droha'* found inaperson[175].In this emotional disorder the victim can go upto the extent of physical attack and even murder also.

2. *Shoka* (grief):

Shoka is characterized by depressive nature with sorrowful attitude. It may be originated from bad experiences of the past, insult, personnel loss, death of relatives etc. The degree of *Shoka* can be measured on the basis of intensity of '*Dainya'*[176]. The victim of Shoka can suffer from diarrhoea, insomnia and pyrexia etc.

3. *Bhaya* (fear):

Intensity of Bhaya is examined by '*Vishada'*[177]. This is a specific emotion bywhich so many diseases are caused. Fear is caused due to injuries of physical and social environment, when one is threatened by some social foe or by some physical threat from the environment, one may attempt to flee from it with accompanying feelings of fear.

Flight and attack are the basis and the primitive activities concomitant with the emotions of fear and rage. Fear in civilization most frequently occurs without physical running away from the situation although as we shall see, psychological running away is quite common.

4. *Chinta* (anxiety):

Sometimes individual suffer from an emotional disorder, which is psychologically just as disabling as the more extreme forms of fear but in which the individual really does not know, of what he is afraid, this is known as *Chinta*.

Neurotic anxiety is perhaps the most important of all the symptoms in the sphere of emotions of psychopatholgy. The physiological concomitants of tachycardia, of increased respiration, and of sweating of skin surface, which occurs in real fear likewise characterize this anxiety.

By the above emotional disorders and the other than them viz. *Lobha* (greed), *Moha* (narcosis), *Irshya* (jealousy) etc, many diseases are seen. Thus the great importance is given to theses psychic factors in respect of their knowledge and necessity of description. Skin disorders fever, insanity, insomnia, diarrhoea, hysteria, *Apatanaka* and so many other diseases are found originated by these emotional factors.

The means by which the body is influenced have never been completely explore, and we shall probably never have a full account of them. A mental tension affects both the voluntary system and the vegetative nerve system. By means of vegetative system the tension is communicated to the whole body, and so, with every emotion. The whole body is itself in a tension. The manifestations of this tension, however, are not as clear at every point, and we speak of symptoms only in those points where the results are discoverable if we examine more closely we shall find that every part of the body is involved in an emotional expression, and the these physical expressions are the consequences oftheactions of the mind and the body. It is always necessary to look for these reciprocal actions of the mind on the body, and of the body on the mind, since both of them are parts of whole with which we are concern.

Role of *Manas Bhavas* in the etiopathogenesis of *Kushtha*:

Charaka mentioned that depending upon the specific nature of the *Nidana* and also specificity of the *Dushya* afflicted, *Dosha* when aggravated manifest innumerable types of disease[178]. When allow to persist for long time afflicted, these psychic disorders viz. *Kama* etc. and somatic disorder like *Jvara* etc. may get affected with each other[179].

Chakrapani opines four possibilities in this context i.e.

(i) *Shariranam Sharirena* (ii) *Manasanam Manasena*

(iii) *Shariranam Manasena* (iv) *Manasanam Sharirena*

Among these it is to be pointed out that varying degree involvement of both mental as well as physiological aspects of man are present in all kinds ofdisease.
As described earlier, *Raja* & *Tamas* are pathogenic factors of *Manas*.

Also, influence of the psyche cannot be ruled out in any disease, because body and psyche have close association with each other. *Kushtha* is also not exception to the relation of psyche and body.

The direct psychological references are available in the etiological factors of *Kustha*. Blaming of good persons like saint, murder, stealing of others properties etc. have also been mentioned as the *Nidana* of *Kustha*[180]. Such antisocial and misbehavior and sinful activities make serious and long standing impact on mind of persons who are indulging in it. *Bhaya* (fear), *Krodha* (anger), *Shoka* (grief) etc. are originated by such activities leading to vitiation of *Dosha* which leads to *Kustha*. *Nidanas* like *Papakarma* seven causes affliction to the second generation[181].This observation highlights the seriousness of psychic factors in the etiology of *Kushtha*.Rasa is mainly affected *Dushya* in case of *Kitibha Kushtha* and *Vicharchika*. While explaining the *Srotodushti Nidanas*, *Charaka* mentions that over worrying (*Chintyanam Cha Atichintanat*) is one of the *Nidana* of *Rasavaha Srotodushti*. *Rasavaha Srotodushti* is also an after effect on *Ajeerna*, which is also caused by the disturbed state of mind. Even though food is in proper quality and wholesome it may not be get properly digested if the person is affected by *Chinta* (worry), *Shoka* (grief), *Bhaya* (fear) etc[182]. The causes of *Ama* includes *Kama* (lust), *Krodha* (anger), *Lobha* (greed), *Moha* (confusion) and *Shoka* (grief) etc.[183]*Swedavaha*

Srotas is also important in the pathogenesis of *Kushtha*. *Krodha, Shoka* and *Bhaya* causes *Svedavaha Srotodushti*[184].

Among the different etiological factors different *Manas Bhavas* like *Chinta, Shoka, Bhaya* etc. are prominently described for *Vata*vitiation. *Vata Prakriti* persons are more prone to anxieties and worries. *Prakrita Kapha* is explained as *Bala* and *Oja*. Any impairment (*Dushti*) in *Kapha* leads to abnormal functioning of *Ojas*. *Ojas* can be roughly correlated with immunity. So, the above condition may be understood in terms of immunological disorders especially having psychological origin.

Further skin is directly related with *Manas*. *Charaka* mentioned that the skin, sensory organ of touch pervades all over the body. It is always in association with mind also. The mind again pervades the sense of touch. So, there is a close association with mind and skin. Hence, any imbalance in the mind affects the skin and any abnormalities of the skin affect the mind, which forms a vicious circle.

5 PSYCHOLOGICAL ASPECTS OF SKIN DISEASES

There is a difference in opinion amongst dermatologists about the conditions classified as Psycho- dermatological. Still it is generally agreed that at least 30% disease conditions are initiated by psychic and emotional factors. Some patients react to emotional or mental stress by a set of cutaneous changes, while some patients exhibit no skin changes at all. Dr. Patrick Hall- Smith explains this by theory of constitutional predisposition or organ inferiority[18]. This can be co-related with *'sthana-vaigunya'* in Ayurveda.

Dermatologists have classified dermatological diseases into 3 groups-

a) Always psychological in origin

b) Combination of psychogenic and other aetiological factors (eg.Discoid Eczema)

c) Aggravated by psychogenic factors (eg. Psoriasis)

Effect of skin disorder over the psyche-

Skin is the first presenting organ for any individual. Even before initiation of conversation, the skin starts the inter-personal communication in its own way. The quality and health of skin can create a feeling of like or dislike towards an individual. There is a primeval aversion towards the patients with skin disorders and people have been avoiding such patients for the benefit of their own health.

Also, the patient's own opinion regarding their skin is parallel to others. They are distressed about their own look and try to avoid social get-togethers or going out publically. They tend to become detached and isolated. This happens especially when the presentation of the disease is on the exposed part of the body such as face, neck, hands etc. and there are some disturbing symptoms like itching. This type of behavior is called 'leper complex'.

1. Disfigurement: This could be due changes in colour and contour of skin. This can happen in a common disease like acne vulgaris to a more severe like leucoderma or

port-wine stains. A much harsh condition can be of leprosy. Other damages to the skin could be informed of scaly appearance, pustules or nodules. These changes tend to bring suicidal thoughts in the mind of the patient.

2. Disablement: The presence of skin disease especially on the hands (fingers) spoils the working capacity of the person. The presence of contact dermatitis on hands of a woman makes the routine household chores like washing difficult for her. Similar thing can happen to a worker whose job requires hand-skills. Also there is a possibility of unemployment due to the disease affecting the exposedskin.
3. Discomfort: Symptoms such as itching and pain are sufficient to provide physical discomfort to the patient. Mental discomfort is caused by the mere presence of skin disease.
4. Depression: All the above mentioned factors are capable enough to push the patient into depression and this may happen even in the most stable persons. It becomes a vicious cycle as setting down of depression tends to worsen the severity of symptoms like itching. Feeling of disgrace in society and rejection can put the patient into isolation and further suicidaltendency.
5. Death: Such conditions are rare and happen when the functioning of the skin is hampered. Few examples are temperature control, barrier function, cutaneous blood flow etc.

Effect of psyche on the skin[187]

Stress factor can precipitate or aggravate the skin disease or worsen the severity of certain symptoms like itching. There is a little evidence of stress being the only cause of skin disease. Dermatitis artefacta is one such disease caused due to emotional factors.

Basic Facts regarding the mind and the skin :

1. Embryologically, both the skin and brain are derived from the ectoderm.
2. Close psychological relationship between the mind and the skin.
3. Skin is an important part of individual's development, behaviour and ego.
4. Skin health, beauty and cosmetics are an important part of sex appeal.
5. Skin is the canvas for reflection of emotions like fear, anger, happiness, despair.
6. Skin is the expression of social and biological transactions in the daily life.

Thus, it can be said that, it is a reasonable estimate that emotional factors are of significant etiological importance in all skin diseases. In India, psychological factors are responsible for skin diseases in about 10 to 15 per cent of cases affecting mainly the educated, economically well-off classes.

The direct and indirect influence of the mind on the skin can be summarized as follows:

1. The symptoms or signs may be completely psychogenic, e.g., some cases of pruritis and hyperhidrosis etc.

2. The emotional factor is often the most important feature in reactions of hypersensitivity, e.g., some cases of pruritis exzema, urticaria, prurigoetc.

3. A normal emotional manifestation in the skin may occur too easily and be maintained, e.g. rosacea, hyperhidrosis.

4. Emotion may be one of the excitants setting off or aggravating virus and other infections, e.g., recurrent herpes, sycosis barbae. Emotional disturbances may predispose to in infections e.g. recurrent herpes, sycosisbarbae.

5. Emotional disturbances may predispose to skin infections, e.g., hyperhidrosis leading to tinea pedis and various infections.

6. Emotinal conflicts may increase the risk of exposure to venereal diseases, or increase the chance of drug intoxication or increase the risk of dermatitis, e.g., compulsive neurosis leading to excessive use of soap oranti septics.

7. The gratification of itching if inhibited in one skin area, may be satisfied elsewhere, because one area is less forbidden than another, e.g., some cases of neuro dermatitis, flexural prurigo and excoriated eruptions.

The above list of skin-mind relationship at once makes us aware that skin diseases cannot always be treated as superficial, somatic lesions; they are, in fact, multifactorial in origin, and are conditioned by varied constitutional and environmental factors.

6. *TWACHA* AS *MANAS VYADHI ADHISHTHANA*

The disease prevention and health promotive approach of '*Ayurveda'* takes into consideration the whole body, mind and spirit while dealing with the maintenance of health, promotion of health and treating ailments.

In Ayurvedic texts, skin is described as one of the five '*Gyanendriyas'*, an organ which is responsible for *Sparsha'Gyan'* or touch sensation. Therefore, it plays a major role in the physical and mental well being of an individual. It is seen that, patients with the skin disorder always experience physical, mental and socioeconomic embarrassment in the society. This embarrassment leads to mental stress which further causes aggravation of preexisting disease.

Acharya Charak has described that the skin has an eternal relationship with *Manas* (psyche/mind) [188]. Therefore, any mental stress due to any cause has a direct impact on the skin. Thus, we can say that stress and skin diseases have an eternal relationship with each other.

Ayurveda recognizes that the connection between the brain and the skin is more than a physiological fact. Skin conditions can impose great effects on every field in the patients' lives. Reciprocally, skin diseases can be evoked by psychological problems.

Acharya Gayadaas has described improper food and improper conducts as the etiology of skin disease (*Kushtha Roga*). He further categorizes the improper conducts into 3 groups, physical, verbal and mental.

Acharya Charak has described '*Vipraan Gurun Gharshayataam'* as the etiological factor of *Kushtha*(skin diseases in *Ayurveda*)[189].It means that behavioural misconduct or verbal sinful activities like abusing teachers, deities etc or other verbal antisocial activities directly or indirectly produces psychogenic stress which is mainstay in the pathogenesis of most of the skin diseases.

Most of the authors in *Ayurveda* considered *Kushtha Roga*(skin diseases) as *Paapkarmaja Vyaadhi* (a disease due to sinful activities). Both *Charak* and *Sushruta* have described the skin disease as most chronic disorder[190]. Long standing diseases produce psychogenic stress to the patient, which further aggravates the preexisting disease.

Some forms of psychogenic stress like *Bhaya*, *Shoka* itc cause *Swedavaha Srotodushti*, which is considered as an etiological factor of *Kushtha Roga* (skin diseases). Another form of psychogenic stress, *Chinta* causes *Dushti* of *Raktavaha Srotas*which is also considered as an etiological factor of *Kushtha Roga* (skin diseases).

The Non pharmacological therapies in *Ayurveda* include *Daivavyapashraya* chikitsa and Satvavajaya Chikitsa. *Sushuruta Samhita* has quoted that the two types of treatment modalities viz *Yuktivyapashraya* and *Daivyapashraya* are for the management of *Kushtha* roga, as the disease *Kushtha*is originated due to derangement of *Doshas* and *Paapkarma* (sinful activities) [191].

Daivavypashraya Chikitsa

Daivavyapashraya Chikitsa include chanting *Mantras*, *Aushadhi* and *Mani Dhaaran*(spiritual use of herbs and gems), *Mangal Karma* (propitiary), *Bali* (offering oblations), *Homa*, *Prayashchita*(ceremonial penances), *Upavasa* (fasting), *Swastyayana* (rituals for social well being) etc[192].

Vagbhata, the author of *Ashtanga Hridaya* cited that use of *Vrat*, *Seva* (service), *Tyag* (renunciation), *Daan* (donation), worship for deities, friendly behavior with everyone etc. roots out the skin diseases (*Kushtha Roga*), as it is originated due to vitiated *Doshas* (*Mala*) and *Paapkarma*[193].

All these ritual activities directly or indirectly exert a positive impact on the mind (*Manas*) and therefore, cause reduction in stress, reduction & abolition of negative thoughts like suicidal ideations etc.

These activities also strengthen the mind (*Manas*/*Satva*) help in reduction in frequency of social withdrawal and increase frequencies of social activities/participation in social programs. Thus help in accommodation with society.

Satvavajaya Chikitsa

Sattvavajaya in principles is full-fledged Psychotherapy, which has been described in Ayurvedic literature. *Charaka* defines it as '*Sattvavajaya Punah Ahitebhyo*

Arthebhyo Manognigrah". Means a method of restraining or withdrawal of the mind from unwholesome objects (*Arthas*) [194].

Thus, the term *Sattvavajaya* implies to that modality which is therapeutic for mental or emotional stresses and disturbances. This is secured best by restraining the mind from desire for unwholesome objects, directing it towards wholesome objects and the cultivation of *Gyana*, *Vigyana*, *Dhairya*, *Smriti* and *Samadhi*. All these measures help indeveloping control over the *Manas* or mind, which is always unstable[195].

Ultimately, these modalities improve the quality of life in the patients of skin diseases (*KushthaRoga*) and thus help these patients to cope up with skin diseases.

7.DISEASE REVIEW- *KITIBHA KUSHTHA*

Kitibha: The disorder said to be occurring in the4th and 5th layer of skin[196]

Nidana of Kitibha:

There is no specific reference regarding the etiological factor for *Kitibha Kushtha*, at the same time no particular aetiology has been depicted for any of the different varieties of *Kushtha* specifically. The general causes have been described which becomes aetiological factors for the formation of *Kushtha*.

For example – taking diet against the regimen given in the literatures specially eating guru and *Virudha* and *Asatmya Ahara*, eating during indigestion after consumption of liquid substances or post vomiting period, after exercise, after coitus etc, eating non veg with milk etc, entering extreme heat, causing sudden vomiting with holding vomiting[197] .Further it is stated that the effect of karma like murder of a Brahmin, lady, piousperson, abducting other women etc causes *Kushtha*[198].

It is stated that *Kushtha* occurs even after therebirth of person afflicted with disease in the previous life[199] .

In *Sushruta Chikitsa*9/9 the similar aetiology has been given in nutshell. *Charak Samhita* has given the similar opinion regarding the aetiology of *Kustha*ingeneral[200].

This general description of aetiologyin respect to *Kustha*is applicable to any of the 18 *Kusthas* and this applies to *Kitibha Kustha* too.

Samprapti:

The vitiated *Doshas*, influence the *Dhatus* in general and *Rakta* in particularly the above said factors vitiated *Pitta*, *Rakta*and *Sleshma*along with *Vayu* which is vitiated and increased, move along *Tiryak Sira* and erupt in *Bahya Marga* and exhibit their present. The lodging of vitiated and increased *Doshas* caused circumscribed lesion on the skin.

Then this *Doshas* get localized increase and if neglected enter the other *Dhatu*[201] *Astanga Hrudaya* states, the aggravated doshas enters the channels and vitiates the *Twacha, Lasika, Raktas* and muscles and discoloration of skin noted[202].

Purvarupa:

In general there will be roughness of skin (*Roma Harsha*) itching (*Kandu*), excessive sweating or no sweating at all, sometimes anesthesia of the part, blackish discolouration seen as a premonitory symptom of *Kustha*[203]. *Charaka* further says burning sensation, instantaneous appearance of ulcer, excessive pain, all explanation of patches etc as the premonitory symptoms[204].

The *Kusthas* are said to occur due to *Vata, Pita* and also due to formation of *Krimi*or bacteria. However, *Dosha* predominance is supreme in manifestation of this disease[205].

Rogalakshana:

As far as aetiology, pathology and premonitory symptomatology is concerned, all the *Acharyas* have given the general description of *Kustha*only. However the symptomatology has been specified by all the authors as far as the separate varieties are concerned.

The symptoms of *Kitibha*are circumscribed, eruption, discharge, thick skin, itching, glossy or blackish in colour, cloudy in colour[206].*Astanga Sangraha* adds to above symptoms cryptation on scratching[207].

Table No.5. Showing the Sign and symptoms of *KitibhaKustha*:

Sr. No	Sign&Symptoms	S. S.	Y.R	B.P	C.S.	K. S.	A.S A.H
1	*Shyava*	-	+	+	+	+	-
2	*Kharasparsha*	-	+	+	+	+	+
3	*Parusha*	-	+	+	+	+	+
4	*Krishna varna*	+	-	-	-	+	+
5	*Aruna varna*	-	-	-	-	+	-
6	*Srava*	+	-	-	-	+	-
7	*Vrdhimanti*	-	-	-	-	+	-
8	*Guruni*	-	-	-	-	+	-

9	*Prashantani*	-	-	-	-	+	-
10	*Punhapunha utpadante*	-	-	-	-	+	+
11	*Vrutta*	+	-	-	-	-	-
12	*Ghana*	+	-	-	-	-	-
13	*Ugrakandu*	+	-	-	-	-	+
14	*Snigdha*	+	-	-	-	-	-
15	*Ruksha*	-	-	-	-	-	+

8. DISEASE REVIEW –PSORIASIS

The term psoriasis comes from the Greek word meaning to itch and was first used by Galen, to describe a scaly itchy rash on the eyelids and genitalia, which was probably not psoriasis as we know it today. But eczema, description of skin disorders compatible with psoriasis is present in the old statement. Interestingly, it appears that psoriasis was grouped with leprosy by the Greeks and subsequently, until the 19th century. These grouping led to psoriasis being rejected by the community and there are reports of their being burned at the stake in 14th century. It was not until the first half of 19thcentury that psoriasis was described as a separate and definite clinical entity.

Psoriasis is an extremely common dermatosis of worldwide distribution. It can affect any age group, generally young adult of both sexes[208]. The Genetic predisposition is present. Approximately three million peoples are affected. It appears suddenly or gradually. It has autosomal dominant inheritance with incomplete penetrance or multifactor strong association with HLA-B/B, HLA – BW17 and HLA –Cw6.

Environmental factors contribute trauma, sunlight, infection, emotional stress, climatic changes may precipitate relapse. In many cases, psoriasis goes away and can come back repeatedly overtime. Knees, elbows, hands, lumbo sacral region the palm and sole, the scalp and nails, male genitals are the sites of predilection. Lesions often localized to the site of trauma.

Psoriasis is characterized by skin cells that multiply upto 10 times faster than normal. Normally, skin cells that are formed in the deepest layer of skin are getting mature and sloughed off the body surface and replaced by underlying cells[209]. This cycle is approximated need 2-4 weeks and this process is called Keratinization, but in psoriasis, the immune system is mistakenly activated, resulting in an abnormally rapid skin cell cycle. This mean the cells move from deepest layer of skin to the surface in about 4 to 7 days. Since they migrate so quickly, they do not have time to properly mature. So immature cells are sloughs off which looks silvery, white dry scaly in nature.

Causes of Psoriasis:

When immune system is accidentally activated (natural protection against bacteria, virus and other foreign invaders) it results in an acceleration of normal skin cycle.

Psoriasis is now recognized as an inflammatory cycle. This in term causes an accumulation of skin cells on the surface of the skin. Heredity, environmental, diet and psychological factors may also play a role.

Classical Psoriasis:

Asymptomatic or often itchy, red scaly papules and plaques of varying in size and configuration and sharp delineation distributed on the extensors of the body, flexors sometimes involved. Lesions covered with varying amount of loosely attached silvery white scales overlying an adherent translucent membranous scale. Removal latter reveals punctuate bleeding spot (from the elongated capillary looks in dermal papillae) the characteristic Auspitz Sign.

Course is unpredictable and variable; spontaneous remission and relapses of characteristic feature most of patients. It worsens in winter, and sometimes in summer.

Patients will ill define erythematous and a warm lesion indicates unstable form could progress on to erythroderma. Lesion with pronounced mound like scales in seen in rupioid psoriasis.

Cutaneous manifestations result from hyperplasia of the epidermis. Epidermopoiesisis more rapid and transit time of epidermal cells diminished; immature nucleated epidermal cells present in the stratum corneum (Parakeratosis).

Types of psoriasis[210] :

1. **Plaque psoriasis (psoriasis vulgaris):**

Most commonly seen 80% of psoriasis is plaque psoriasis appears as dry, scaly, inflamed patches of the skin. Silvery in colour, silvery white scales are slough out on rubbing the area, affected area found all over the body.

2. **Palm planter psoriasis***:*

Varied manifestations well defined red plaques with thick scales or hyperkeratosis fissured, erythematous, ill defined plaques on the heels or other parts of soles and palms often bilaterally symmetrical.

3. **Guttate psoriasis:**

Adolescent and young males are affected mainly. It generally follows streptococcal pharyngitis. Crop of small oval or circular erythematous plaques with

minimal scaling is seen. Trunk and proximal part of extremities affected.

4. Psoriasis of nails:

Common all nails may be affected, finger nails minored often. Common presentation – pitting of nails plates, sub lingual hyperkerionatosis, onycholysis dystrophy and yellowish or greenish discoloration. Associated with psoriatic lesions elsewhere; occasionally isolated manifestation. Classic psoriatic arthritis often associated with the nail involvement.

5.* Psoriasis of the scalp:*

Common well marginated red scaly discrete or confluent plaques. Palpable lesion when associated with seborrhoeic dermatitis labeled as seborrhic psoriasis or cebhoriasis.

6. Psoriatic arthropathic:

Uncommon associations both sexes affected females more often may precede accompany or follow appearance of skin lesions. Nail involvement frequent classic form– distal interphalengeal joints, often asymmetrically muilance variety – joints of the hand and toes and sacro iliac joint. Destruction of joint and bones associated postural psoriasis. Rheumatoid – like arthritis uncommon sero negative.

7. Erythrodermic psoriasis:

May follow chronic or unstable psoriasis; may start de-novo. Irritant tropical therapy or photo therapy may precipitate. It is characteristically bright red erythematic with extensive, moderate and severe scaly. Almost the entire cutaneous surface involved. No island of normal skin associated nail and scalp involvement. Thermo regulation is poor; patient feel cold recovery- complete clearing or reversion to plaque psoriasis; serious and occasionally fataloutcome.

***8.* Postural psoriasis:** *Localized orgeneralized:*

Localized: -Generally, palm planter with or often without associated psoriasis elsewhere on the body are seen. Superficial pustules on an erythematous background pustule are seen.

Generalized: Rare serious. Spontaneous evolution (particularly in children) or precipitated by systemic infection, irritant applications or withdrawl of cortico steroids.

It affects previously diseased or unaffected skin. It shows generalized or extensive superficial sterile pustule. Confluence leads to takes of pus paronychial involvement trouble sound severe constitutional symptoms- fever, erthrgeal, leukocytosis, hypo-albimenemia, hypocalcaemia seen.

9. Rupioid psoriasis:

Uncommon cone shaped lesions with the heaped up dark gray scales not as easily removable.

10. Flexural psoriasis:

Inverse distribution confined to the flexors- axillary, gluteal, inflammatory or retro auricular folds scaly less pronounced due to moistness candidal super infection may occur.

11. Genital psoriasis:

Male genitals more frequently affected. Well marginated erythematous lesions, scaling minimal.

Histology of psoriasis[211] :

Parakeratosis and spartanly orthro keratosis. Loss of granular cell layer. Uniform, club shaped elongation of the rete ridges and supra papillary thinning of the epidermis. Neutrophilic infiltrate in the epidermis and a sub corneal pustule (munro'smicroabsces) Spongy form postulation (kogoj's pustule) in stratum malpighii in postular psoriasis. Papillary blood vessels dilated, elongated and torchues, Perivascular mononeuclear in filterated.

Morphology of the Lesion:

The typical psoriatic lesion is a raised red scaly patch with a sharply demarcated edge between clinically involved skin and the plaque. The size of this lesions are varies from a few millimeters to several centimeters and are may be large confluent areas of psoriasis the trunk or limbs on rare occasions this may be extend to involved all the skin .

If the scale is thick the plaque has a grayish white colour. However to, if the scale is not too thick the patch so psoriasis has a predominantly red colour. If the plaque is excoriated with a wooden spatula (Grattage). The red patch develops a white flaky

surface as the scale in psoriasis is loosely bound. These are a useful sign in distinguishing psoriasis from other dermatosis. Another useful sign is removed of all the scale by more vigorous excoriation with the spatula, and then a red glistening surface with capillary bleeding points appears. Occasionally when the scaling the plaque is very thick deep fissures develop which can be painful.

Rare forms of psoriasis are the so called rupioid lesions. These are thicker than common plaque psoriasis and have a conical shape. They have a yellowish brown colour and are most frequently seen on the feet, the appearance is produced by the thicker and more adherent scale, which becomes heaped.

Age of Onset:

Psoriasis may begin at any age. However it is rare before the age of 5yrs. The average age of onset has been found to be in the 20"s in most large studies 10% of patients have an onset before 10yrs, 35% before 20yrs and 58% before 30yrs of age. However, average age of onset is not the same in the different clinical patterns of psoriasis this may be due to different genetic and or environmental factors which determines the clinical expression of the disease, and age of onset is one of them.

Symptoms[212]:

In the majority of the patients psoriasis gives rise to very few physical symptoms. It is likely to lead to many more psycho social problems because of appearance of the rash.

Itching:

A Small proposition of patients, approximately 5-10% will complain of irritation. Only in a minority of these does the irritation become severe enough to warrant specific anti itch therapy. If the itch is severe, then active treatment to clear psoriasis is the best approach.

Pain:

Psoriasis will cause pain if the skin splits and fissures develop. Fissures are most commonly seen in flexural and intertriginous psoriasis, thick plaque psoriasis over joints and in severe psoriasis on palms and soles.

Scaling:

Patient often complains bitterly of the excessive scaling of the skin when there is scale involvement this give rise to dandruff on the cloth. When there is extensive involvement of the skin, patients produced a sure of scale when they take their clothes off, and they will find it too embarrassing to go to hotels or stay with friends. Some get over this problem by taking a small vacuum cleaner or dust pan and brush with them.

Loss of mobility:

Confluent psoriasis over joint may lead to lack of mobility as psoriasis is not as pliable as normal as normal skin. This may be severe problem when the hands are involved.

Skin patches:

-Dry and rough in touch.

-Usually round and covered with silvery scales.

-Raised patches of skin are hard in nature.

-Accompanied by red border

-In chronic condition patches are exudative and sticky in nature with blackish discolouration.

Shivering:

This occurs in erythrodermic psoriasis patient a great deal of heat in this form of the disease because of the increased blood flow through the skin.

Constitutional upset:

Fever and malaise occur with generalized posturalpsoriasis.

Psychosocial aspect:

In the majority of the patient the appearance of the rash is the only side effect which effect the rash on the (patient) usually depends on the personality of the individual many patients with severe disease appear to cope well, while other minimal involvement find it difficult to accept the disability. Obviously the rash is visible i.e. on the hand or face then this may lead to greater problems.

In the majority of patients in psoriasis there will be some withdrawal from social contact. Apart from the appearance there is a still widely held belief by the non sufferers that psoriasis is a contagious disorder and therefore sufferer should be avoided. This is in addition to the appearance of the rash lead to isolation. The age of onset of psoriasis is important in degree of harm it may cause socially. The adolescent will have more problems adjusting then the mature adult in a family situation. Psoriasis is also been shown, not surprisingly, to have an effect on sexual behavior, the effect being greater upon women the majority of patients will not include in sporting activity, particularly swimming. For this reason will not take holydays in the sun and sea.

Psoriasis may also lead to problem with employment if there is involvement of the hands and the face occupations involving coming into contact with public will be difficult in this situation. The two psychological disorders which are increased in psoriasis are – depression and upset status.

These would appear to be direct result of the physical disability in the subject which possible pre disposition to this status.

Natural history of prognosis:

Psoriasis runs a variable course, and it is not possible to predict if and when spontaneous resolution may occur, if the disease will remain static, or whatever it will become more extensive. However the various clinical patterns of psoriasis tend to have difficult prognosis.

Plaque psoriasis, which begins in childhood and adolescence, then to have a poorer prognosis that late onset disease and it, is more likely to be persistent. Other poor prognostic signs are extents of disease and appearance of new lesions. When the rash is very wide spread remission are less likely to in sue. If the patients find the involvement is gradually increasing the remission is unlikely in the near future. In long term follow up studies of patients with plaque psoriasis the incidence of spontaneous remission has been found to be approximately 40%.

Guttate psoriasis usually has a good prognosis and in most of patients the erruption will disappear within 3-4 months of onset. Occasionally the guttate psoriasis may convert into plaque disease and prognosis is that of the later which is unpredictable and variable.

Patients who have had one attacks of guttate psoriasis are likely to develop further episodes if they have infections with the streptococcus or certain viruses.

Guttate psoriasis may occur in individuals who have no previous lesions are those who have plaque disease. In the later the guttate lesions clear after 3-4 months, but plaque disease in variably persist.

The prognosis in erythro dermic psoriasis tends to be poor. Patients with this form of the disease need active treatment often with symptomatic drugs. The natural history of the disease modifies by treatment. The majority of patients often the active phase may revert to extensive chronic plaque disease, which again usually requires long term active systemic therapy. Erythrodermic phase are likely to reoccur, unless there is an identifiable curse which can be prevented or patients are maintained on indefinite system ictherapy.

Generalized postular psoriasis has a risk death the acute episode of postulation may last many week but it is now modified with therapy ones the postular phase has subsided the condition usually revert to the chronic plaque state. However further bouts of acute postular psoriasis associated with acro dermatitis continue tend to have a bad prognosis.

Localized postular psoriasis on the palms and soles tends to be very persistent over a 10 yrs period only approximately 25% patients are likely to achieve a diminution. The disease however is not commonly seen in the elderly, so presumably spontaneous remission does occur but only after 20-30yrs.

Acrodermatitis continua (postular involvement around the nails and on the nail bed) have a poor prognosis in the elderly. The condition is very persistent and not responsive to treatment usually gradually progresses to wide spread plaque disease with a tendency to generalized postular psoriasis.

9. DISEASE REVIEW- *VICHARCHIKA*

Etymology:

*Vicharchika*word is derived from "*Charcha*" dhatu, *Vee*- prefix and '*Navul'*-suffix. It means that a type of *Swalpa* (Minortype) *Kustha*[213] .

Thus, *Vicharchika* is derived from "*Charcha Adhyane*" by adding prefix '*Vee*; to it. The word *Adhyane* has two syllables viz. *Adhi* and *Ayne*. *Adhi* means above and *Ayne*means spread out. Thus it reads as *Kshudrapidika* spreads with *Kandu* elevated on the surface of the skin is termed as*Vicharchika*.

Nirukti of Vicharchika

Shabdakalpadrum describes two main features founded in *Vicharchika* i.e. cracking of the skin mainly occurs on the skin of hands & legs '*Visheshena Care-Ayate Padasya Twak Vidaryate Anaya Iti Vicharchika'* which means the disease which coats/covers the skin in particular manner & causes cracking of skin of hands &feet mainly.

Definition

1. According to *Acharya Charaka, Vicharchika*is defined as '*Sa Kandu Pidika Shyava Bahu Srava Vicharchika'*[214] .

Means the skin disease where eruptions over the skin appear with dark pigmentation, itching with profuse discharge from the lesion.

2. *Vicharchika* according to *Sushruta* is '*Rajyo Atikandu Atiruja Sa Ruksha Bhavantii Gatreshu Vicharchikayam'*[215].

According to *Susruta* the condition in which skin is dry with severe itching & marked linings present in *Vicharchika*. Furthermore he added that if the same condition appears at the feet with pain, then it is known as '*Vipadika'*. *Acharya Madhava, Vagbhata* & *Bhavamishra* have described almost same definition as *Acharya Charaka Kashyapa* describes *Vicharchika* as blackish brown eruption with intense itching & pain[216] .

While *Acharya Harita* considered a multiple pin head sized eruptions withulceration & itching inVicharchika[217] .

Bhel narrates *Vicharchika* as a dark red coloured deep-rooted lesion with moisture or oozing[218] .

Nidana

There is no specific description about etiological factors of the disease *Vicharchika* but it is being a variety of *Kshudra Kustha*, the etiological factors of the *Kustha* are to be accepted as the etiological factors of the *Vicharchika*.

Etiological factors of *Kustha* and may be same factors causes *Vicharchika* as mentioned in different Ayurvedic texts may be classified into following groups.

1. ***Aaharaja Hetu*** **(causes related to food habit)**

2. ***Viharaja Hetu*** **(causes of other activities)**

3. ***Aacharaja Hetu*** **(causes of behavior)**

1. **Aaharaja Hetu**

Aaharaja Hetus are chief responsible factors in the production of the *Kustha* (skin diseases). Among them *Viruddha* & *Mithya Ahara* are the main dietary factors.

A) ***Viruddha Ahara***– There are eighteen types of *Viruddha Ahara*.

'*Viruddha'* or '*Vairodhika'* is the technical terms for incompatible or antagonistic. It means that, which acts as antagonistic to physiological factors and remains in the body and produce various diseases. *Acharya Charaka*h as stated that the substances acting antagonistic to '*Dehadhatu'* are *Vairodhika*[219].

B) ***Mithya Ahara***– *Mithya Ahara* means improper Diet.

2. Viharaja Hetu

Viharaja Hetu (causes pertaining to activities) also plays an important role in the production of skin disease. *Mithya Vihara*, *Vegadharana* & *Panchakarma pacharan* are few such main *Vihara Hetus*.

a. ***Mithya Vihara*** – It means improper activities. That is sudden changes from cold to heat & vice-versa, entering into cold water immediately after one is afflicted with fear, exhaustion & sunlight etc are said to be the causative factors for the *Kustha* as stated in the table.

b. ***Vega Vidharana***– The suppression of *Vamana*, *Mutra* & *Purisha Vegavarodha* may produce skin disease.

c. ***Panchkarma pacharen***– It is also a significant cause in the production of skin disease. Moreover, improper administration of *Snehapana* therapy is also said to be the causative factors for skin disease.

d. Aachara Hetu

It means causes pertaining to behavior. Good morals are also necessary for a man to be healthy. *Sadvritta* is the conduct of nobles in respect to physical, verbal & mental behavior.

Aachara Hetu is also said to be as one of the causative factors for *Kustha*, i.e. insult to Brahmins, Teachers & other respectable persons. Indulgence in sinful activities, etc. are said to be the causative factors for such disease.

Acharya Charaka has mentioned the involvement of *Krimi* in the disease *Kustha*. *Acharya Sushruta* has also stated that all types of *Kustha* originate from *Vata*, *Pitta*, *Kapha* & *Krimi*. So *Krimi* may be taken as one of the probable causative factor for *Vicharchika*[220].

***Samprapti* (Pathogenesis)**

Description of *Samprapti* according to *Acharya Charaka* & *Sushruta* is as follows, According to *Charaka Samhita*, due to various *Nidana Sevana*, *Tridosha* gets vitiated simultaneously & produces *Shaithilya* in the *Tvak, Mamsa, Rakta* & *Ambu*. Then *Tridosha* gets seated in *Shithila Dhatu* & vitiating them with *Lakshanotpatti* of *Kustha Roga*.

According to *Acharya Sushruta*, *Nidana Sevan* causes vitiation of *Vata*, which carry vitiated *Pitta* & *Kapha* to the *Tiryaka Gami Sira* at the level of *Bahya Roga Marga* i.e. *Tvak, Rakta*, *Mamsa* & *Ambu*. Here, these vitiated *Dosha* gets seated. If these *Doshas* are not treated properly, they may penetrate the deeper *Dhatus* of body and produces various types of *Kushtha Roga* in that *Vicharchika* is one[221] .

***Samprapti Ghataka* Of *Vicharchika*- Summarized As –**

1) **SaptakoDravyaSangraha:**

***Dosha* :** *Tridosha*, *KaphaPradhana*

(all Acharya except Su. & M.) *Pitta Pradhana*(Su)

Vata-Pitta Pradhana(M.)

Vata: *Vyana, SamanaPitta*:

Pachaka, Bhrajaka

Kapha: *Avalambaka, Kledaka*

***Dushya*:** *Twak, Rakta, Mamsa, Lasika*

2) ***Agni* :** *Jatharagnimandya, Dhatvagnimandya*and*Amavisha*

3) ***Srotasa*:** *Rasavaha, Raktavaha, Mamsavaha,Swedavaha*

***Srotodushti*:** *Vimargagamana, Sanga*

***4) Udbhava*:** *Amashaya*

***Sanchara Marga*:** *Tiryaka- Gami- Sira*

5) *Adhisthana*: *Twak,*

***Rogamarga*:** *Bahya*

***Prabhava*:** *Chirakari* (chronic)

Purva Rupa

Vicharchika is a type of *Kshudrakustha*, so *Purvarupa* of *Kustha* can be considered as a *Purvarupa* of *Vicharchika.* In general there will be roughness of skin horripilation (Roma harsha) itching (*Kandu*), excessive sweating or no sweating at all, sometimes anesthesia of the part, blackish discoloration seen as a premonitory symptom of kustha[222].

Charaka further says burning sensation, itching, blackish discoloration of the skin instantaneous appearance of ulcer, excessive oozing.

RUPA:

Full manifestation of *Vicharchika* is mentioned various Ayurvedic classics which are being tabulated as follows:

Table No. 6. Signs and Symptoms of *Vicharchika*.

Rupa	C.S.	S.S	A.H./ A.S.	M.N.	Bh	K.S	B.P.	Ha.
▪ *Kandu*	+	+	+	+	+	+	+	-
▪ *Vedana*	-	-	-	-	-	+	-	-
▪ *Ati-ruja*	-	+	-	-	-	-	-	-
▪ *Daha*	-	+	-	-	-	-	-	-

Color of Pidika (Lesion)								
▪ *Shyava*	+	-	+	+	+	-	+	-
▪ *Shweta*	-	-	-	-	-	-	-	+
▪ *Rakta*	-	-	-	-	+	+	-	-
Srava (Nature of discharge)								
▪ *Bahusrava*	+	-	-	+	+	+	+	-
▪ *Ruksha*	-	+	-	-	-	-	-	+
▪ *Lasikadhya*	-	-	+	-	-	-	-	-
▪ *Praklinna* *(Mamsenopachita)*	-	-	-	-	+	-	-	-

According to *Sushruta*, the lesion of *Vicharchika* is *Ruksha* so it becomes *Ruksha Vicharchika* (dry eczema) others have mentioned either *Srava* or *Lasika* in lesion called wet type of *Vicharchika*.

Among the *Lakshanas* the related *Doshas* can be as follows

Vata– Rukshata, Shoola, Shyava,

Pitta-Daha, Srava, Paka, Kleda, Rakta

Kapha– Atikandu, Kleda.

Doshic Dominance in *Vicharchika*:

Charaka- *Kapha* ***Vagbhata-*** *Kapha* ***Sushruta-*** *Pitta*

Sadhyasadhyata

Even though *Kushtha* is considered to be one of the *Mahagadas* by *Sushruta*, it is considered *Sadhya*, if *Dooshyas* of *Twak*, *Rakta* and *Mamsa* are only involved with *Doshas Vata* and *Shleshma*. In *Kashyapa Samhita*, *Vicharchika* is considered *Sadhya* among 9 *Sadhya Kushta Rogas.*

10 DISEASE REVIEW- ECZEMA

The terms 'Eczema' & 'Dermatitis' are synonyms. They refer to distinctive reaction patterns in the Skin, which can be either acute or chronic & are due to a number ofcauses.

Definition –

Eczema is a specific type of Allergic cutaneous manifestation, which is characterized by superficial inflammatory Oedema of epidermis associated with vesicleformation, Itching & Redness[223].

General predisposing causes of eczema –

1. Age – Infancy, Puberty, Menopause
2. Family history – Familial sensitiveness is an important factor. There is usually a personal/family history of Allergy.
3. Allergy – Asthma, Eczema, Hay fever, etc. genetic predisposition is responsible for the disease in certain families.
4. Debility – Malfunctioning in immuneregulation
5. Climate – Extreme heat, dampness or severecold
6. Psychological factors – Responsible for hypersensitivity reaction.
7. Local factors- Hyperhydrosis, Varicose veins, etc.
8. Exciting cause of Eczema

The following causes irritation & sensitizes the skin –

1. Chemicals – used in insecticide, fertilizer, oil, cement, etc.
2. Plants – Contact with various types of plants, which act either as irritant or sensitizer is known as Phyto dermatitis. It usually occurs on the exposed part, particularly the face & hands. Due to inhalant allergies from pollens may cause acute recurrence of dermatitis on the head, neck, limbs, hands & even parts covered by clothes.

E. g. marking nuts, Cashew nuts, Euphorbia.

Clothing & Footwear – Common offending substances are clothes, rubber footwear, spectacle frames, water straps, furs, suspenders, artificial jewellery, etc. severe itching & purparic dermatitis on the body. The distribution of which is typical is caused by various Clothing like terry cot, nylon, etc. Rubber contact dermatitis is caused by the additive, Resins, Oils, etc.

3. Cosmetics – Hair dyes, particularly the derivatives of paraphenylene diamine & kumkum are the common. Hair oil, deodorants nail paint & removers are also responsible for allergic contact dermatitis.
4. Medicaments – Contact dermatitis caused by medicaments is common complication in the treatment of skin disease, & is termed as dermatitis medicamentosa. Cutaneous eruption develops from the use of a drug systemically viz. by mouth, inhalation or parenterally. For
   e.g. – Penicillin extract, Sulphonamides, Chlorthiazide, Methyldopa.
5. Infections – Eczema resulting from sensitization to certain organisms like streptococci, staphylococci, dermatophytes &yeast organisms is known as infective eczema or infections eczematoiddermatitis.
6. Diet & Digestion – Spices, condiments, tea, coffee & alcohol taken in excess amount causes predisposition to allergic conditions & dermatosis. Indigestion also aggravates skin disease.
7. Focal sepsis – Internal septic focus shedding toxins or causing bactereamia are also exciting cause of Eczema.

The classification of Eczema[224]-

1. Acute
2. Subacute &
3. Chronicstage.

- **The acute stage** is characterized by itchy erythema followed by oedema, papules, and vesicles, oozing & crusting. Most of the typical eczemas of moderate intensity stats with these morphological features. It lasts for maximum two weeks & then lesions starts to heal.

- **The sub-acute stage**, characterized by papules & scaling with moderate oedema & erythema. Acute eczema may pass through this stage before it heals completely or becomeschronic.

- **The chronic stage**: The eczema lasts over months or years, it becomes chronic, characterized by thickened skin & pigmented with prominent criss-cross markings (lichenification). This is end result of all types of long-standing eczemas.

Contact dermatitis (chemical eczema)

It develops within a few hours after contact with the offending agent (allergen to which the patient is potentially hypersensitive).

Features-

- Eruption develops briskly, spreading far beyond the original point of contact.

- Eruption has ill-defined margin, fading at the periphery.

- Brisk oedema & uniform vesiculation.

- Usually occurs on the exposed parts.

It is mainly due to following causes –

- Plants

- Clothing & footwear

- Cosmetics
- Occupationalchemicals
- Medicaments

Contact Allergic Eczema

This is due to a delayed hyper sensitivity reaction following contact with antigens or haptens. Previous exposure to the allergen is required for sensitization & the reaction is specific to the allergen or closely related chemicals.

The Eczema reaction occurs wherever the allergen contacts the skin & sensitization persists indefinitely. It is important to determine the original site of the rash before secondary spread obscures the picture, as this often provides the best clue to the contactant. There are many easily recognizable patterns, e.g. –Eczema of ear lobes, wrists & back due to contact with nickel in costume, jewellery, Eczema of the hands &wristsdue to rubber gloves etc. Oedema of the lax skin of the eyelids & genitalia is a frequent concomitant of allergic contact eczema.

Infectious Eczematoid Dermatitis

This type of Eczema results from sensitization to certain organisms like streptococci, staphylococci, dermatophytes & yeast.

Infective Eczema can be divided further into three sub types.

a. **Post traumatic infectiveeczema**

It starts with a crack in the skin brought on by an injury, blister, an insect bite, etc. This gets infected, sensitization results in eczematization& a well defined circular or oral patch of eczema consisting of erythema, oozing & crusting is formed. If there are several patches, the intervening skin is completely clear.

b. **Follicular infectiveeczema**

It involves hairy regions like the scalp, beard & legs. When it occurs on the scalp, it is often labeled as seborrhoeic dermatitis. It starts, usually with pityriasis capitus which gets

complicated by one or several itchy patches of oozing, pits & crusting. The eczema spreads to the forehead, retro-circular folds & cheeks.

a. <u>Flexural infective eczema</u>

The flexures are the sites of predilections, common examples, the neck folds, the axillae, and the bends of elbows, the groins & the popliteal fossae. It starts with a crack in the depth of the fold, & the two opposing surfaces are equally affected like the leaves of a book. The inner part looks moist & red; only at periphery is crusting clearly evident.

Infantile Eczema

This occurs in children between the age of 3 months & 2 years. The exact classification of infantile eczema is not well established but there is general belief that there are 2 types of infantile eczema–

1. **With high familial predisposition** to an allergic disease – the atopicvariety
2. **Without familial predisposition** – the simple variety Dietetic allergies may also play an important role in the causation & infants who are over fed, & are too rapidly introduced to adult food stuffs, frequently suffer from infantile eczema.

Atopic Eczema

Atopy is a genetic predisposition to form excessive IgE which leads to a generalized & prolonged hypersensitivity to common environmental antigens, including pollen & the house dust mite. Atopic individuals manifest one or more of a group of diseases that includes asthma, hay fever, urticaria, food & other allergies, & this distinctive form ofeczema.

Atopic disease show maternal imprinting i.e. they are inherited more often from the mother than from the father. The prevalence of atopic eczema is increasing & hasincreased between 2 to 5 fold over the last 30 years. It now affects 1 in 10 school children.

Environmental factors such as exposure to allergens have been shown to have a role in the etiology of atopic eczema.

Disseminated (Eczematides)

It is characterized by tiny, papular, vesicular & occasionally bullies crusted lesions occurring singly or in small patches resulting from sensitization to the products of primary active eczema being conveyed by the blood stream to distinct sites producing dissemination of the eczematous process. This process is called auto- sensitization, brought on particularly by the use of strong medicament, irritants or sensitizers applied to the primary eczematous site.

Pompholyx (Dyshidrotic)

Recurrent vesicles & bullae occur on the palms, palmar surface of the fingers & soles & are excruciatingly itchy. This form of eczema can occur in atopic eczema & in the exogenous eczema. It can be provoked by heat, stress & nickel ingestion in a nickel – sensitive patient but is often idiopathic.

Discoid Eczema

This is a common form of eczema recognized by discrete coin-shaped lesions of eczema associated with alcohol excess & of elderly men. It can occur in children with atopic eczema & tends to be more stubborn to treat.

Seborrheic eczema

Seborrheic eczema is a very common chronic dermatosis characterized by redness & scaling & occurring in regions where the sebaceous glands are most active, such as the face & scalp & in the body folds. In infancy this type of eczema starts as cradle cap on the scalp which develops in to slight exudation & thick crusting. This eczema spreads from the scalp to the auricular region, the periphery of the face & neck.

Varicose dermatitis

This is simply traumatic, chemical or infective eczema complicating varicose veins or ulcers of the legs. Itching in varicose legs may start eczema by excoriation, secondary infection & by the use of medicaments, in this the dorsum of the foot & lower part of the leg show telangiectosis, oedema & pigmentation.

Asteatotic Eczema

This is frequently seen in the hospitalized elders, especially when the skin is dry. Low humidity caused by central heating, over washing & diuretics are contributory factors. It occurs most often on the lower legs as a rippled or crazy poving pattern of fine fissuring on an erythematous background.

Gravitational (Stasis) Eczema

This occurs on the lower legs & is often associated with signs of venous insufficiency characterized by oedema red or bluish discoloration, loss of hair, haemosiderin pigmentation & ulceration.

Photodermatitis

Dermatitis in this condition is confined to the exposed parts of the body viz. face, neck, 'V' of the chest, hands & external surface of the fore arms & dorsa of feet & the adjoining parts of legs. The integument is sensitive to sunlight & ultraviolet rays.

Neurodermatitis

Affecting more commonly neurotic people, this condition may be defined as the lichenification process resulting from chronic scratching & rubbing of the skin under stress & anxiety. The condition is common amongst young people & menopausal women. These patients tend to tear off their skin when they cannot get at others for social reasons. Any emotional conflicts particularly those arising from sex, financial & social problems may initiate itching, scratching produces further irritation, & a vicious cycle is established resulting in Lichenification.

- **Histology of eczema**[225]

In acute eczema- Epidermal changes-

1. Inter cellular oedema-Spongiosis. (With associated lymphocyte exocytosis).

2. Intra epidermal vesicles-seen.

3. Mononuclear perivascular infiltration-seen.

4. Thickening of the epidermis-acanthosisseen

5. Parakeratosis seen.

In chronic eczema-

1. Acanthosis

2. Hyperkeratosis

3. Mononuclear cell infiltration.

Dermal changes; in both acute & chronic dermatitis-

1. Acanthosis: Increased thickness of prickle cell layer, the results of hyperplasia, (often with hypertrophy) of the prickle cell.
2. Hyperkeratosis: Excessive formation of keratin, resulting the horny layer being thicker than is normal for the skin of the areaaffected.
3. Parakeratosis: An abnormal form of Keratinization in this condition granular layer of the epidermis is disappears.

- Prognosis inEczema**:**

Dermatitis & Eczema are, as a rule, curable conditions. Eczemas are non-infective except when they are impetiginized & of the infective variety. They do not leave scars. The patient needs reassurance of these points.

It must be remembered that epidermis is an ectodermal structure, & so, takes time to heal. Patient must be watched; energetic treatment is to be strongly discouraged. Once warned, the patient will readily co-operate.

Acute eczemas heal readily, in about 1- 4 weeks, with treatment. Chronic eczemas, in which anatomical & functional changes set in, take time to disappear. Disseminated & generalized eczemas are not only slow to heal, but are accompanied by ill health infantile & atopic eczemas are troublesome & uncomfortable. The former lasts till the age of two

unless it develops into atopic eczema which may continue till the age of twenty five or even through life. Its course is marked by spontaneous remissions & exacerbation. Climatic extremes, psychotic stresses & poor health, aggravate dermatitis & eczema. The cure of conditions is related in tropical countries, by heat, humidity & prevalent unhygienic conditions.

MATERIALS AND METHODS

Materials:

- **Literature**: All Ayurvedic texts namely *Brihatrayi*, *Laghutrayi* with special commentaries including modern text and updates on websites, research articles about skin disorders and their psychological effects were studied and documented for the intended study.
- **Medium of Dissertation -** English, it was supplemented with Ayurvedic Terminologies whenever necessary in Sanskrit.
- **Data Collection Tools** (the questionnaires for PASI, EASI and Skindex-29 are attached in the Appendix 1, 2 and 3 respectively)

1. **Questionnaire to decide the severity of Psoriasis – Psoriasis Area and Severity Index (PASI)**

   PASI is used to evaluate the severity and area of lesions into a single score ranging from 0 to 72.

2. **Questionnaire to decide the severity of Eczema – Eczema Area and Severity Index (EASI)**

   EASI is a tool for the evaluation of area and severity of eczema with its scores ranging from 0 to 72. It takes a few minutes and experience to calculate it accurately. EASI score does not include a grade for dryness or scaling.

3. **Questionnaire to assess the effect of skin disease on the mental health and the quality of life of the subject- Skindex-29**

   This questionnaire was specifically designed to assess quality of life in patients with dermatological conditions. The questionnaire covers areas considered crucial in an instrument designed to evaluate quality of life, such as, degree of symptoms, psychosocial functioning, and emotional status. The 29-item version is a refinement of a previous 16-item version, and combines the advantage of an easier administration with improved psychometric properties.

   Skindex-29 was previously tested and validated and its English language version, used in the current study, was also previously validated. Skindex-29 in this

study was obtained from the original Skindex-29 author, Mary- Margaret Chren, MD, and also from the MAPI Research Trust.

Each question in the survey had a 5-point answer scale, ranging from ‘‘never’’ (0) to ‘‘all the time’’ (5); the lower the score (range 0-100) the better the patient’s overall quality of life. The overall quality of life score can be further divided into 3 domains: the patient’s emotional state, symptom severity, and functioning state.

- **Sample size:** Sample size calculation was done by using statistical software. Total no. of patients – 226,
  2 groups (113 Psoriasis patients and 113 Eczema patients), from M.A. Podar Ayurvedic Hospital, Worli, Mumbai – 400018

Methods:

Type of study:

a) Literary Study

b) Observational Study

a) Literary study

Data collection tools: *Brihattrayi* and *Laghutrayi*

Data collection method: Literature review

1. References from *Brihattrayi* and *Laghutrayi* along with the commentaries were compiled.
2. The principle *‘te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti’* was discussed along with the implication of individual words from the commentary. The context and location of the principle in Charak Samhita was explained. Also differentiation of similar concepts from the texts were also discussed. Observations on literature supporting the concept were discussed.
3. All the references were analysed. The references from Charak Samhita, Sushruta Samhita, Ashtang Hridaya and Ashtang Sangraha were elucidated from the original

texts and available commentaries. The gathered references were the assembled from physiological to pathological factors. The body and mind relationship instances were analysed from time of conception till death along withthe examples from disease and treatment perception.

4. The body-mind relation was also discussed as per contemporary conditions.
5. The relation between skin and mind was also elucidated with supporting references from *Brihattrayee* and *Laghutrayee.*
6. The principle was subjected to observational cross-sectional study
7. The comparison of quality of life of Psoriasis subjects and that of Eczema subjects was done.
8. Conclusions were drawn accordingly.

b) Observational study:

- Method of data collection: Survey by self-administered questionnaires
- Tools for data collection: The Questionnaires (PASI, EASI and Skindex) as explained above were used for data collection.
  The PASI and EASI indices were first studied under the guidance of a dermatologist before using them on patients.
  Similarly, Skindex 29 was studied under the guidance of a psychiatrist before using it on patients.
- Study design: Cross-sectional study design
- Sampling technique: Convenience (non – probability) sampling

- Sample Size:

a) Sample Size Calculation, for Psoriasis using prevalence rate as 8%

$n = (Z\ 1\text{-}\alpha/2)^2\ p\ (1\text{-}p) / e^2$

$n = (1.96)2 \times 0.08\ (1\text{-}\ 0.08) / (0.05)^2 = 113.04$

(Z 1-α/2 – Standard normal variate; p< 0.05; hence 1.96 is used in the formula, p – Prevalence rate (8%), e - Absolute error)

b) Sample Size Calculation, for Eczema using prevalence rate as 6.75%

$n = (Z\ 1\text{-}\alpha/2)^2\ p\ (1\text{-}p) / e^2$

$n = (1.96)2 \times 0.06\ (1\text{-}\ 0.06) / (0.05)^2 = 86$

The sample size for Psoriasis came out to be 113 and that for Eczema was 86. But for comparison purpose, 113 cases of each skin disease (Psoriasis and Eczema), total 226 were enrolled in the present study.

- **Study Centre-**

1. Dept. Of Sanskrit-Samhita-Siddhant, R.A. Podar Medical College (Ayu), Worli, Mumbai -400 018
2. OPD no. 15 of M. A. Podar Ayurvedic Hospital, Worli, Mumbai -400 018

Criteria for Selection of Patients:

Inclusion Criteria-

1. Patients in age group 15-60 years
2. Gender- male and female
3. Patients with signs and symptoms of Psoriasis
4. Patients with signs and symptoms of Eczema
5. Patients who voluntarily gave consent for the study

Exclusion Criteria-

1. Females of Menopausal age
2. All systemic disorders except Psoriasis and Eczema
3. Patient taking oral drug therapy for any other diseases
4. Patient with any drug allergy
5. Patient diagnosed with any Psychological disorder prior to commencement of the skin disease
6. Patient having Family history of any Psychological disorder.

Reasons for exclusion: Females of menopausal age may develop symptoms like mood changes, anxiety, and sleep disturbances. In systemic disorders it may be difficult to understand the exact pathology. Some drugs like Estrogen, Calcium channel blockers, bromocriptine may have psychological side-effects. If the patient has any psychological disorder prior to the skin disease or history of psychological disorder, it cannot be ascertained that the psychological changes have occurred due to the skin disease.

Following investigations were carried out to rule out any other diseases:

1. Blood Sugar Levels (Fasting and Post-Prandial)
2. Urine Analysis (Routine and Microscopic)
3. CBC-ESR

Diagnosis of Psoriasis and Eczema was done on the basis of signs and symptoms described in the texts. The investigations had no role in diagnosis of the disease. They were done to rule out any other systemic disorders.

Signs and symptoms of Psoriasis—

i. Small flat –topped papules or larger plaques

ii. Scaly appearance of lesions

iii. Dull red lesions with silvery scales

iv. Itching may be present

v. Common sites- knees, elbows, scalp

vi. Auspitz's sign in some cases (appearance of punctuate bleeding spots when scales are scraped off)

Signs and symptoms of Eczema—

i. Dry scaly skin

ii. Redness

iii. Itching may be present

iv. Sometimes oozing

v. Lichenification at later stage

vi. Commonly affected areas – knee, wrist, face and hand.

- **Plan of work:**

- All patients suffering from either Psoriasis or Eczema were informed about the present study.
- Written informed consent was obtained from all the patients before any study related procedure.
- Each study participant was subjected to two self-administered questionnaires (PASI for Psoriasis Patients or EASI for Eczema Patients, Skindex – 29).
- Data collected from the study was organized in Microsoft Excel-sheets, presentedin the forms of graphs and tables.
- The data was subjected to unbiased statistical analysis to derive conclusions.

- **Plan for Statistical Analysis:**

The study data generated and collected was put to statistical analysis to reach to the final results and conclusions. The demographic data were presented in tables and graphs. The data obtained in the studies were subjected to tests of significance. GraphPad InStat (www.graphpad.com) software was used for statistical analysis of data.

Following tests were applied:

i. Spearman's Correlation Coefficient

ii. Unpaired t – test

P value < 0.05 was considered significant.

OBSERVATIONS & DISCUSSION

Observations regarding location of the principle (*siddhant* in *Brihattrayee*)

Table No.1 Location of the *siddhant* in *Brihattrayee*

Name of the Samhita	Reference	Context
Charak Samhita	Cha.Vi.6/8	Classification of diseases.
Sushruta Samhita	Su.su.1/26	Body and mind are explained as seat of diseases and they are interrelated. This excludes *aatma* as seat of diseases as it is *nirvikaar.*
Ashtang Hridaya	Ash.su.1/21	Quoted the two seat of diseases

The principle appears in the 6th *adhyaya* of *Charak Vimansthana- Roganikvimana adhyaya.* The groups of diseases according to *prabhav, bal, adhisthan, nimitta* and *aashaya* are discussed in this *adhyaya*. These diseases have anguish factor in common but differ according to the above mentioned characteristics. While explaining the infinite diseases, *Aacharya Charak* remarks that in spite of having different causative factors like *sharir dosha* and *manas dosha,* these diseases have three common factors or *hetu,* which are *asatmyaarthsanyog, pradnyapradha* and *parinaam.* They produce changes in the abode (body and mind) of each other.

These somatic and psychological diseases are interdependent. *Aacharya Chakrapani,* comments that if these diseases stay in the body or mind for a long time, they tend to vitiate each others habitat or they may also increase the strength of each other. This occurs in somatic diseases, psychological diseases or in somatic and psychological diseases.

Maximum references were found in Charak Samhita, the list of which is in the table below-

Table No. 2 Similar references from Charak Samhita

Sr. no	**References**	**Context**
1	Cha.su.1/54	There are two seats of diseases- body and mind. They act separate as well as in union.
2	Cha.su.1/55	The mind which is connected to the body and soul can act as a seat of disease. In absence of this unison, life perishes.
3	Cha.vi.6/3	Diseases are classified as *sharir* and *manas* based on *adhishthana*.
4	Cha.vi.6/8	Infinite diseases concised and classified into 2 finite groups ie *sharir* and *manas* and they are interrelated.
5	Cha.sha.2/41	Diseases develop only in the union of body and mind.(*sharirsatvaprabhav*)
6	Cha.sha.4/36	The body and mind influence (anuvidhiyate) each other in reference to description of 16 mental constitutions (manas prakruti)
7	Cha.chi.3/36	Jwara is of 2 types – *sharir* and *manas* and if they are present in human body for a long time can exhibit symptoms in each other.
8	Cha.ni.8/16	*Nidaanarthkar vyadhi*: one disease becomes the causative factor of other. But here only *sharir vyadhi* are discussed.

Certain examples supporting this principle were located in the texts:

Table No. 3 Role of *manas hetu* in *sharir vyadhi*

Sharir Vyadhi	***Manas hetu***	**References**
Rogavardhan	*Vishada*	*Cha.su.25/40*
Rogkartutva	*Bhaya*	*Cha. Su.9/9 Chakrapani tika Ash.hri.su.4/24 Ayur Rasayan tika*

Rasavahasrotas dushti	*Atichintanaat*	*Cha.vi.5/13*
Swedavahasrotas dushti	*Krodha, shoka, bhaya*	*Cha.vi.5/22*
Asaadhya vyadhi	*Autsukya, arati, sammoha*	*Cha.su.10/20*
Annam na jeeryati	*Chinta, shoka, bhaya, krodha*	*Cha.vi.2/9*
Vaatprakopa *Pittaprakopa*	*Kaam, shoka, bhaya* *Krodha*	*Cha.chi.3/115*
Aagantuja atisaar	*Bhaya, shoka*	*Cha. Chi.19/11, Su.Ut.40/7*
Avrushyata *Klaibya*	*Daurmanasya* *Ahridya bhaav*	*Cha. Su.25/40* *Su.chi.26/9-10*
Mudhagarbha *Garbhashatan*	*Bhaya* *Shoka*	*Ma.ni.64/Mudhagarbha* *Su.Ni.8/3*
Nidranasha	*Chinta, shoka, bhaya, krodha*	*Madhav nidan*
Vegvan naadi *Kshina naadi*	*Kaam, krodha* *Chinta, bhaya*	*Yo.ra.naadipareeksha/24*
Pralap *Vepathu*	*Bhaya* *Kopa*	*Yo.ra.sannipata bheda/18* *Su.Ut.39/79*
Pradar	*Shoka*	*Yo.ra.strirogadhikaar*
Chardi	*Dwishtaarthsanyog, manoghna*	*Cha.chi.20/18*
Arochaka	*Shoka, bhaya, atilobha, krodha*	*Cha. Chi.26/124, Su.Ut.57/6*
Vataja / Pittaja arsha	*Shoka /Krodha*	*Cha. Chi.14/13,15*
Vataja / Pittaj gulma	*Shoka / Krodha*	*Cha.chi.5/10,12*
Vaatrakta	*Krodha*	*Cha. Chi. 29/7*
Palitya	*Shoka, Krodha*	*Su.Ni.13/37*
Shosha	*Shoka*	*Su.Ut.41/16*
Stnyanasha	*Shoka*	*Su.Sha.10/30*

Table No. 4 Symptoms related to mind in *sharir vyadhi*

Sharira vyadhi	***Lakshana***	**References**
Rasakshya	*Ghattate sahate shabdam na ucchhai* *Shabdaasahishnuta*	*Cha.su.17/64* *Ash.hri.su.11/17*
Jwara poorvarupa	*Alpapranata (Manas balhani)*	*Cha.ni.1/33*
Vataja grahani	*Gruddhi sarvarasaanaam, mano-avasad*	*Cha.chi.15/62*
Vataja hridroga	*Deenata, shoka, bhaya, shabdasahishnuta*	*Ash.hri.ni.5/40*
Tridoshaja gulma	*Manshariragnibalaphaarinam*	*Ma.ni.28/gulma*
Shanka visha	*Jwara, Chardi, Murcha, Daha, Glani, Atisaar*	*Cha.chi.23/24*

Table No. 5 Role of *manas chikitsa* in *sharir vyadhi*

Sharir vyadhi	***Manas chikita***	**References**
Hikka	*Krodha, harsha, priyodvega, vismapan, bhaya* (intervention using sudden emotions)	*Cha.chi.17/37*
Aagantuj Atisaar	*Harshan, Aashwasan*	*Cha.chi.19/12*
Chardi	*Manoanukul vaacha (Aashwasan, harshan)*	*Cha.chi.20/41*
Karshya	*Achinta*	*Ash. Hri.su.14/34*
For garbhadharan	*Saumanasya*	*Cha.su.25/40*
Arochaka	*Manojnya annapan, harshan, aashwasan*	*Yo.ra. Arochak chikitsa*

Observations on literature review supporting the concept

1. The definition of health as described by Ayurveda as well as WHO includes both physical and psychological well-being.
2. The existence of human life is based on the union of body, mind and soul. In

the absence of this bond, life does not exist.

3. The elements of the human body viz. physical body and mind which are formed from the permutations and combinations of *panchmahabhutas* are susceptible to change. Hence diseases ie change from healthy condition, occurs only in body and mind. It does not occur in soul.

4. *Panchbhautic* composition of *tridosha* and *triguna* show resemblance. The *panchbhautic* composition of *vaat dosha* is *vayu* and *aakash*, *pitta dosha* is *tej* and *kapha* is *prithvi* and *jala.* The inter-relation between *mahabhoota* and *triguna* is also discussed. *Aakash mahabhoota* with *satva, vayu* with *rajas, agni* with *satva* and *rajas, aap* with *satva* and *tamas* and *prithvi* is related to *tamas. Tamoguna* has the capacity of forming *aavaran* ie covering or obstacle. *Kapha* having similarity in composition (*prithvi*) also is capable of forming *avarodha* or obstacle. *Rajoguna* is active and has the property of stimulating. *Vaatdosha* has similar composition (*vayu*) and similar properties. *Satva guna* is *laghu* and *prakashak* ie *enlightening.* We observe that *pittadosha* is associated with *dhi, dhruti, smruti* which play an important role in the process of acquiring knowledge.

5. The digestion and assimilation of food depends on the mental state of the person. Hence loss/increase in appetite, constipation, nausea are some of the symptoms observed in anxiety. Similarly consuming good quality or *sattvic* food increase the *sattva guna* (feeling of happiness and health) of the mind. The *samanya-vishesh siddhant* can be observed here.

6. Emotions act as a causative factor *(hetu)* in healthy as well as disease conditions.

7. Certain somatic diseases exhibit psychological symptoms also.

8. The disease conditions, in which emotions act as causative factors, have psychological therapies in the treatment modules.

9. The psychological state of a person also decides the prognosis/progression of the disease.

Observations on observational study

The data collected from study was analyzed and observations were recorded as per study groups-

Group A- Psoriasis Patients

Group B- Eczema Patients

For each group, data were recorded under two headings-

A. Demographic details

B. PASI/ EASI index observations & results

In the end, a comparative analysis of statistical observations of two groups was made.

- **Group A- Psoriasis Patients-**

A. DEMOGRAPHICAL DETAILS:

Total 113 study subjects with psoriasis were registered under this group. The demographic analysis of these study subjects is being presented here after. Individual group wise distribution is as given in tables.

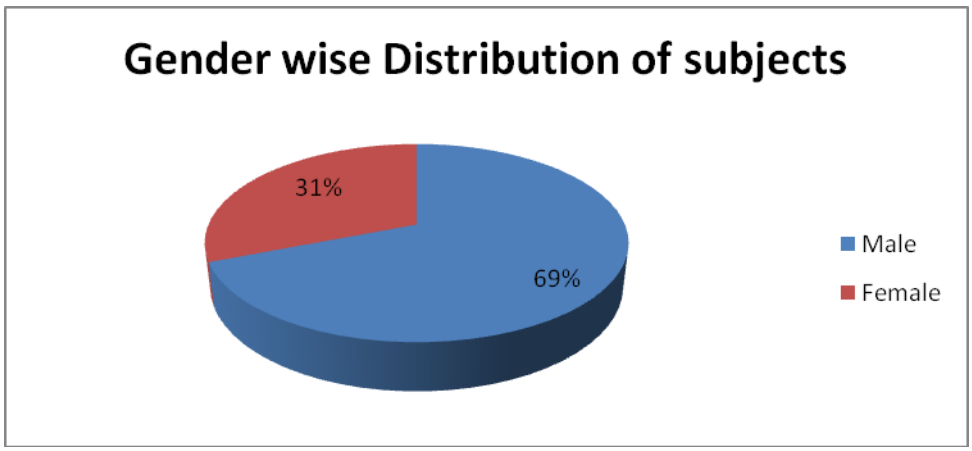
Gender -

Table No. 6 showing Gender -wise Distribution of 113 subjects of Psoriasis

Sr. No.	Gender	No. of subjects	Percentage (%)
1	**Male**	78	69%
2	**Female**	35	31%
	Total	113	100 %

Out of the 113 subjects of Psoriasis, 78 study subjects (69 %) were males, while 35 study subjects (31 %) were females.

Graph No. 1- showing Gender -wise Distribution of 113 subjects of Psoriasis



Age-Group -

Table No. 7- showing Age-group -wise Distribution of 113 subjects of Psoriasis

Sr. No.	Age group	No. of subjects	Percentage (%)
1	**15-30 yrs**	32	28%
2	**31-45 yrs**	49	44%
3	**46-60 yrs**	32	28%
	Total	113	100 %

Out of the 113 subjects of Psoriasis, 32 study subjects (28 %) were from age group 15-30 yrs, 49 study subjects (44 %), were from age group 31-45 years and 32 study subjects (28 %) were from age group 46-60 years.

Graph No. 2- showing Age-group -wise Distribution of 113 subjects of Psoriasis

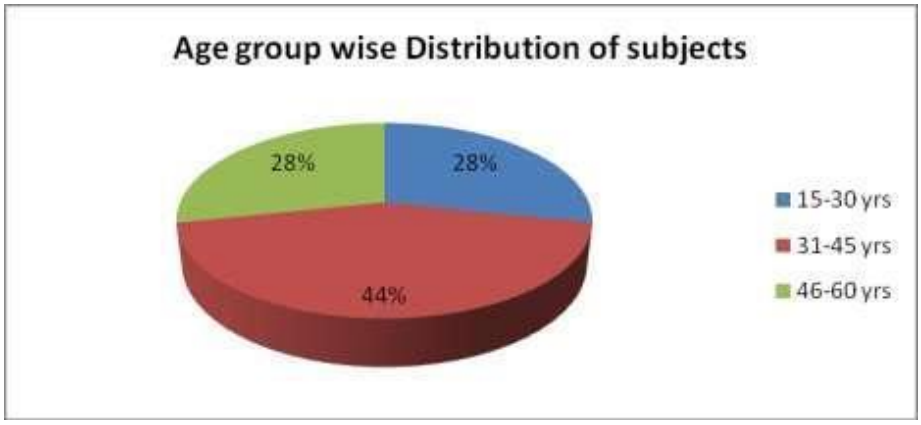
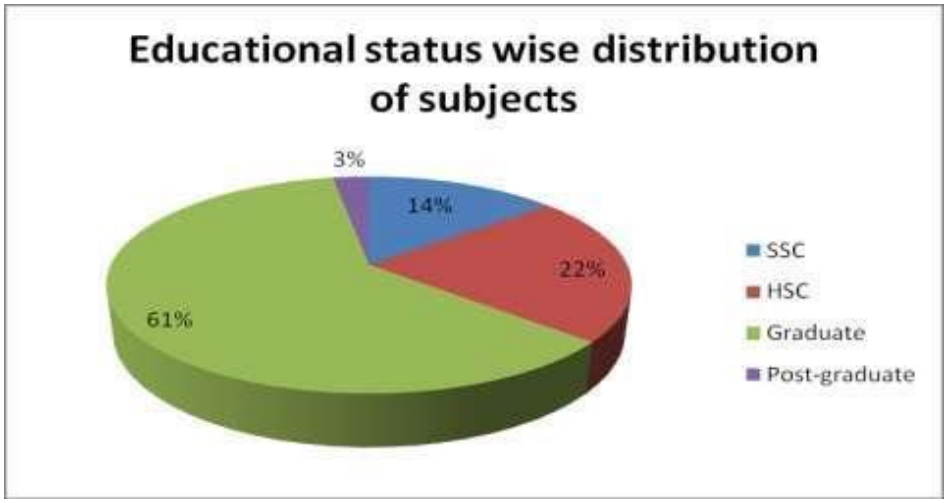


Table No. 8- showing Educational status wise Distribution of 113 subjects of Psoriasis

Sr. No.	Educational status	No. of subjects	Percentage (%)
1	**SSC**	16	14%
2	**HSC**	25	22%
3	**Graduate**	69	61%
4	**Post-graduate**	3	3%
	Total	**113**	**100 %**

Out of 113 subjects of psoriasis, 16 subjects (14 %) were educated till SSC level; 25 subjects (22%) were educated till HSC level; 69 subjects (61 %) were graduate, while 3 subjects (3 %) were post graduate by education.

Graph No. 3- showing Educational status wise Distribution of 113 subjects of Psoriasis



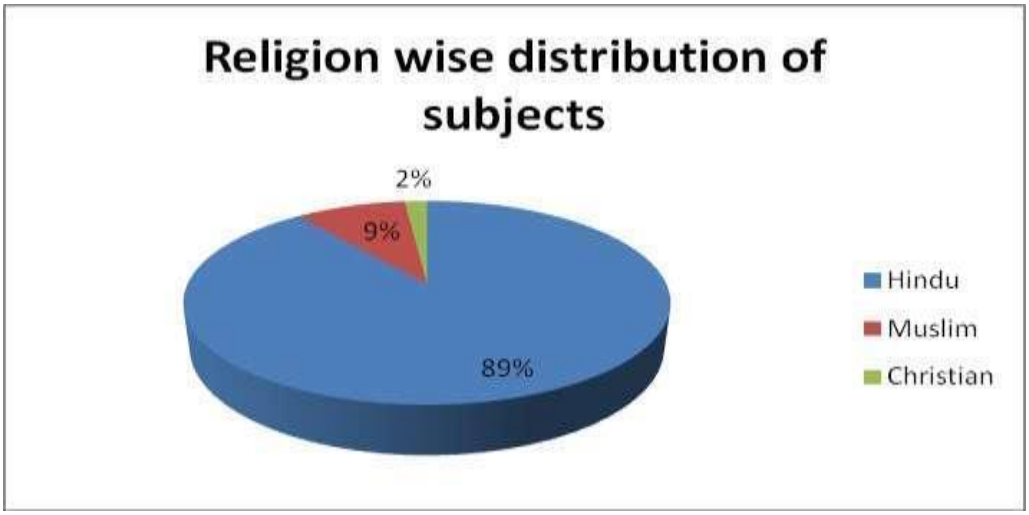
Religion

Table no. 9- Religion wise distribution of 113 patients of psoriasis

Sr. No.	Religion	No. of subjects	Percentage (%)
1	Hindu	101	89%
2	Muslim	10	9%
3	Christian	2	2%
	Total	113	100 %

Out of total 113 patients of psoriasis, 101 subjects (89%) belonged to Hindu religion.10 subjects (9%) were Muslim, while 2 subjects (2 %) were Christian by religion.

Graph no. 4- Religion wise distribution of 113 patients of psoriasis



Occupation

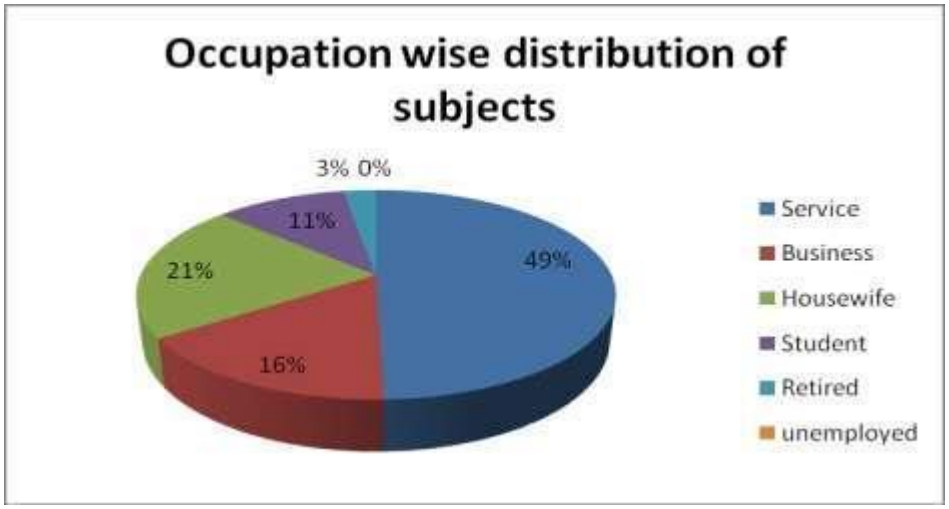
Table No. 10- Occupation wise distribution of study subjects

Sr. No.	Occupation	No. of subjects	%
1	Service	56	49%
2	Business	18	16%
3	Housewife	24	21%
4	Student	12	11%
5	Retired	3	3%
6	Unemployed	0	0%
	Total	113	100 %

Out of total 113 subjects, 56 study subjects (49 %) were having service as

occupation.18 subjects (16 %) were having business as occupation. 24 subjects (21 %) were housewives. 12 subjects (11%) were students. 3 subjects (3 %) were retired, while none were unemployed.

Graph no. 5- Occupation wise distribution of study subjects



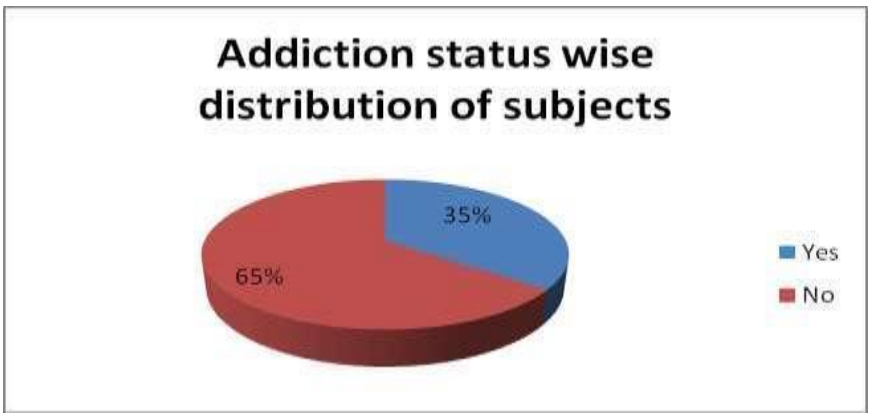
Addiction Status

Table No. 11 Addiction status- wise distribution of study subjects

Sr. No.	Addiction Status	No. of subjects	%
1	Yes	40	35%
2	No	73	65%
	Total	113	100 %

Out of total 113 patients of Psoriasis, 40 subjects (35 %) were having some kind of addictions, while 73 subjects (65 %) did not have any addictions.

Graph no. 6- Addiction status- wise distribution of study subjects



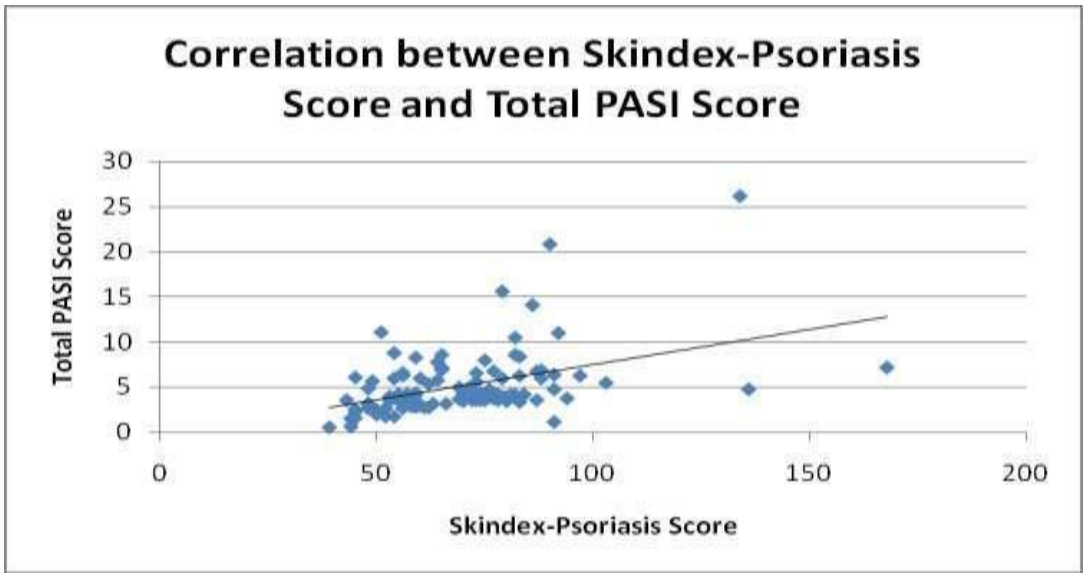
PASI index observation& results:

Table No. 12 Correlation between Skindex Score-Psoriasis and PASI score:

	Skindex Score-Psoriasis	PASI Score
Sample Size (n)	**113**	**113**
Mean	69.59	5.10
SD	19.37	3.49
SEM	1.82	0.33
Passed Normality Test?	No	No
Minimum	39.00	0.60
Median	69.00	4.20
Maximum	168.00	26.10

Number of pairs: 113 Spearman r = 0.4573 Type of Correlation: Moderately Positive Correlation P value: < 0.0001 Extremely Significant

Inference: There is a moderately positive correlation ($0 \leq r \leq 1$) Skindex Score-Psoriasis and PASI score and it is statistically significant too.



- **Graph no 7 Skindex Psoriasis and total PASI score correlation**
- **Table No. 13 Assessment of subjective and objective parameters in Psoriasis**

	Erythema	Thickness	Scaling	Percentage Area Affected	Body Surface Area
Sample Size	113	113	113	113	113
MEAN	2.72	2.42	4.92	4.36	5.16
SD	2.30	2.20	2.47	1.88	3.54
MIN	0.00	0.00	1.00	1.00	0.60
MEDIAN	2.00	2.00	5.00	4.00	4.20
MAX	11.00	10.00	16.00	12.00	26.10

Table No. 14 showing correlation between SKINDEX – Score and various symptoms of Psoriasis in Psoriasis Patients:

Psoriasis - Correlation Between	Number of pairs (n)	Spearman r	P Value	Inference
Skindex Score and Total Erythema Score	113	0.4591 Moderately Positive Correlation	< 0.0001	Extremely Significant
Skindex Score and Total Thickness Score	113	0.1231 Moderately Positive Correlation	0.1939	Not Significant
Skindex Score and Total Scaling Score	113	0.3239 Moderately Positive Correlation	0.0005	Extremely Significant
Skindex Score and Total % Area Affected Score	113	0.3630 Moderately Positive Correlation	< 0.0001	Extremely Significant
Skindex Score and Total Body Surface Area Score	113	0.47 Moderately Positive Correlation	< 0.0001	Extremely Significant

Results:

i. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total Erythema score and it is statistically significant too.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-

ii. Psoriasis and Total Thickness score but it is not statistically significant.

iii. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total Scaling score and it is statistically significant too.

iv. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total % Area Affected Score and it is statistically significant too.

v. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total Body Surface Area Score and it is statistically significant too.

➢ **Group B- Eczema Patients-**

A. DEMOGRAPHICAL DETAILS

Total 113 study subjects with Eczema were registered under this group. The demographic analysis of these study subjects is being presented here after. Individual group wise distribution is as given in tables.

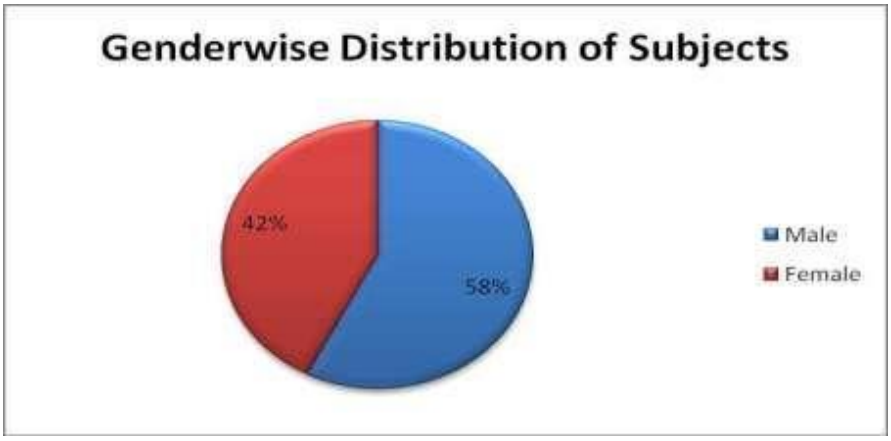
Gender -

Table No. 15 showing Gender -wise Distribution of 113 subjects of Eczema

Sr. No.	Gender	No. of subjects	%
1	Male	65	58%
2	Female	48	42%
	Total	**113**	**100 %**

Out of 113 patients of Eczema, 65 subjects (58 %) were males, while 48 subjects (42 %) were females.

Graph No. 8 showing Gender -wise Distribution of 113 subjects of Eczema



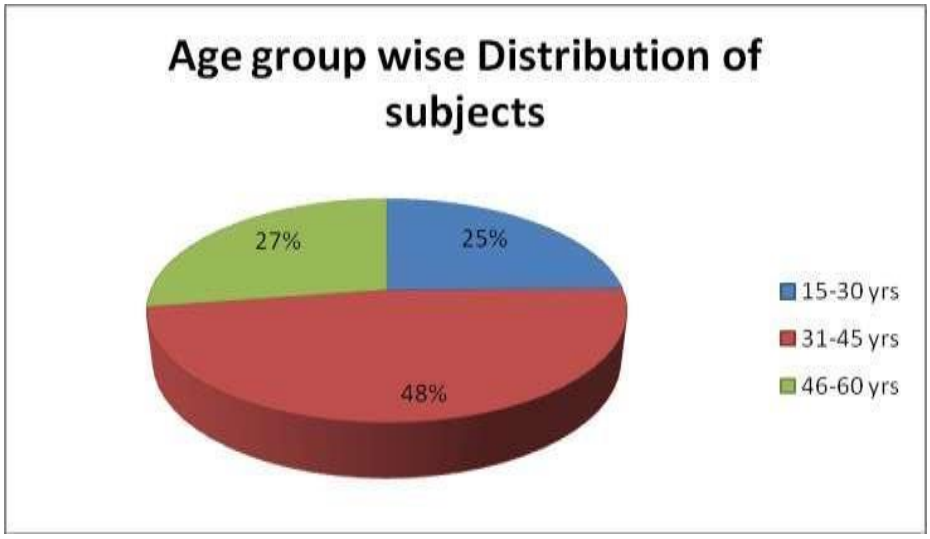
Age group-

Table No. 16 showing Age group-wise Distribution of 113 subjects of Eczema

Sr. No.	Age group	No. of subjects	%
1	15-30 yrs	28	25%
2	31-45 yrs	54	48%
3	46-60 yrs	31	27%
	Total	113	100 %

Out of 113 patients of Eczema, 28 subjects (25 %) were from age group of 15-30 years. 54 subjects (48 %) were from age group of 31-45 years. While, 31 subjects (27 %) were from age group of 46-60 years.

Graph No. 9 showing Age group-wise Distribution of 113 subjects of Eczema



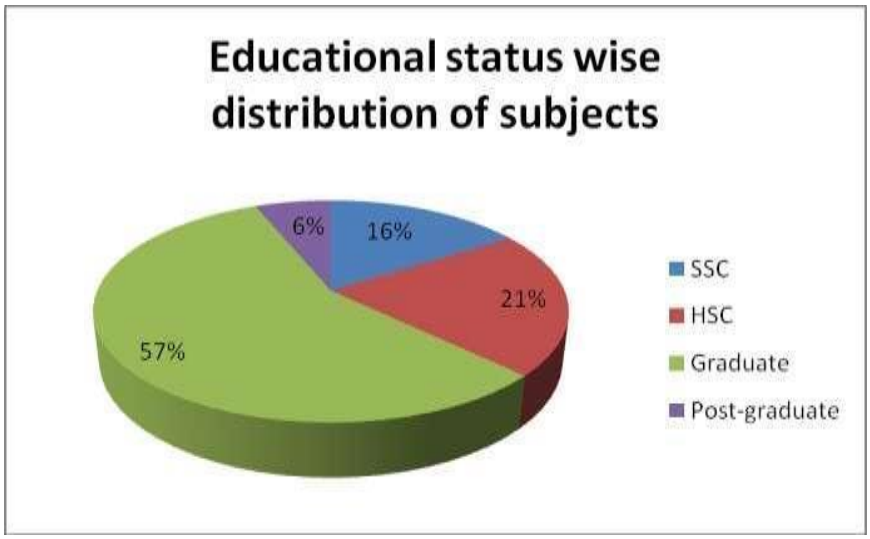
Educational Status-

Table No. 17 showing Educational status-wise Distribution of 113 subjects of Eczema

Sr. No.	Educational status	No. of subjects	%
1	SSC	18	16%
2	HSC	24	21%
3	Graduate	64	57%
4	Post-graduate	7	6%
	Total	**113**	**100 %**

Out of total 113 patients of eczema, 18 subjects (16 %) were educated till SSC level. 24 subjects (21 %) were educated till HSC level. 64 subjects (57 %) were graduates, while 7 subjects (6 %) were studied till post graduation.

Graph No. 10 showing Educational status-wise Distribution of 113 subjectsof Eczema



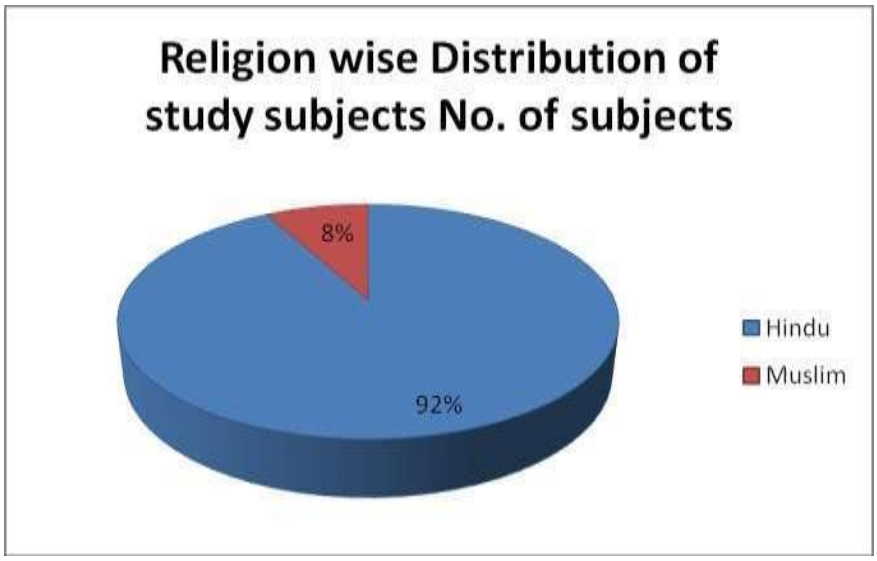
Religion-

Table No. 18 showing Religion-wise Distribution of 113 subjects of Eczema

Sr. No.	Religion	No. of subjects	%
1	Hindu	104	92%
2	Muslim	9	8%
	Total	**113**	**100 %**

Out of 113 patients of eczema, 104 subjects (92 %) were Hindu and 9 subjects (8%) subjects were Muslim by religion.

Graph No. 11 showing Religion-wise Distribution of 113 subjects of Eczema

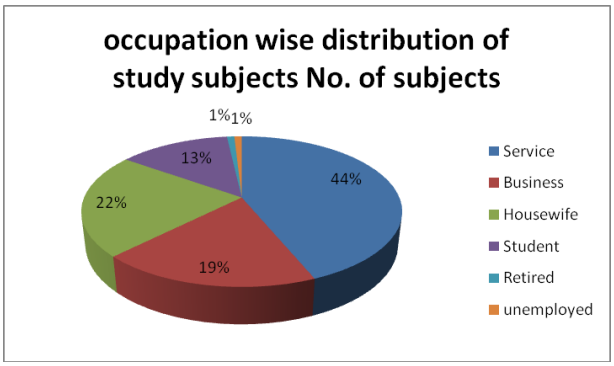


Occupation-

Table No. 19 showing Occupation-wise Distribution of 113 subjects of Eczema

Sr. No.	Occupation	No. of subjects	%
1	Service	49	44%
2	Business	21	19%
3	Housewife	25	22%
4	Student	15	13%
5	Retired	1	1%
6	Unemployed	1	1%
	Total	**113**	**100 %**

Out of 113 subjects of Eczema, 49 subjects (44 %) were having service as occupation. 21 subjects (19 %) were having Business as occupation. 25 Subjects (22 %) were housewives. 15 subjects (13 %) were students. 1 subject (1 %) was retired, while 1 subject (1 %) was unemployed.



Graph no. 12 Occupation wise distribution in Eczema subjects

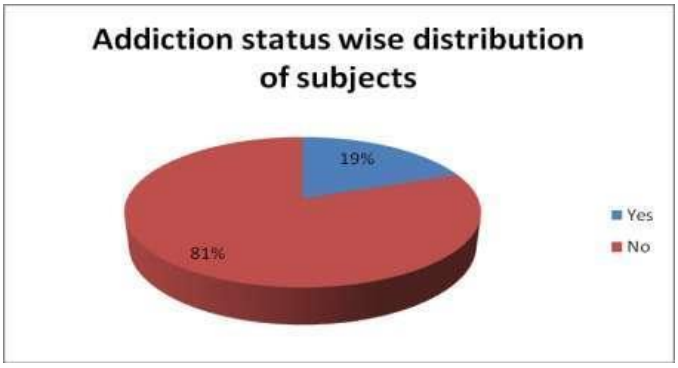
Addiction status-

Table No. 20 showing Addiction status-wise Distribution of 113 subjects of Eczema

Sr. No.	Addiction Status	No. of subjects	%
1	Yes	22	19%
2	No	91	81%
	Total	**113**	**100 %**

Out of total 113 patients of eczema, 22 subjects (19 %) were having some kind of addictions, while 91 subjects (81 %) did not have any addictions.

Graph No. 13 showing Addiction status-wise Distribution of 113 subjects of Eczema



B. EASI index observations & results

- **Table No. 21 showing Correlation between Skindex Score and EASI score:**

	Skindex Score-Eczema	EASI Score
Sample Size (n)	**113**	**113**
Mean	56.74	3.74
SD	13.20	1.43
SEM	1.24	0.13
Passed Normality Test?	No	No
Minimum	36.00	0.60
Median	55.00	3.50
Maximum	124.00	8.40

Number of pairs: 113 Spearman r = 0.228

Type of Correlation: Moderately Positive Correlation P value: < 0.0001 Extremely Significant

Inference: There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and EASI score and it is statistically significant too.

Graph no 14-Skindex eczema score –total EASI score correlation

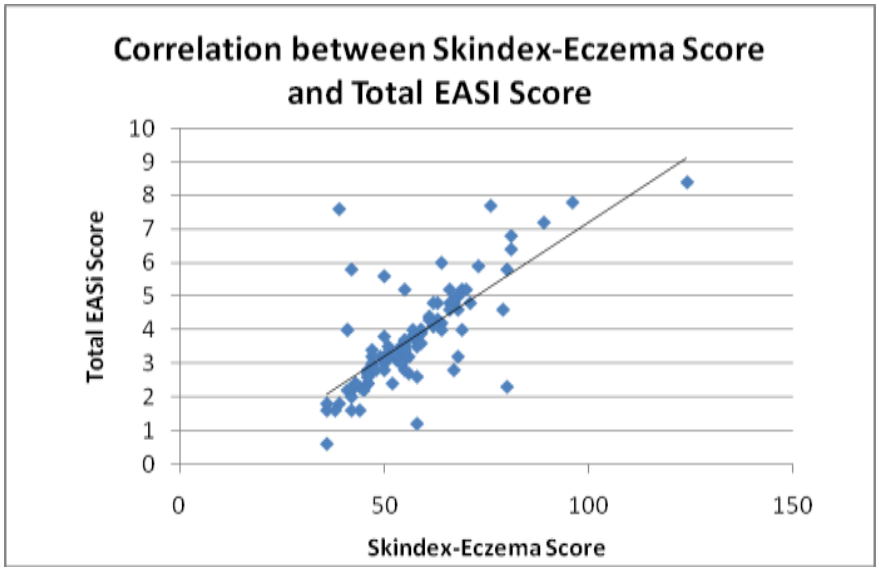


Table No. 22 Assessment of subjective and objective parameters in Eczema

	Erythema	Thickness	Scratching	Lichenification	Percentage Area Affected	Body Surface Area
Sample Size	113	113	113	113	113	113
MEAN	0.52	1.75	4.55	0.47	2.91	3.75
SD	0.71	1.05	1.56	0.68	1.17	1.43
MIN	0	0	2	0	1	0.6
MEDIAN	0	2	5	0	3	3.5
MAX	3	4	9	2	6	8.4

Table No. 23 showing correlation between SKINDEX – Score and various symptoms of Eczema in Eczema Patients:

Correlation between	Number of pairs (n)	Spearman r	P Value	Inference
Skindex Score and Total Erythema Score	113	0.001319 Moderately Positive Correlation	0.9889	Not Significant
Skindex Score and Total Thickness Score	113	0.3327 Moderately Positive Correlation	0.0003	Extremely Significant
Skindex Score and Total Scratching Score	113	0.3584 Moderately Positive Correlation	< 0.0001	Extremely Significant

Skindex Score and Total Lichenification Score	113	0.1539 Moderately Positive Correlation	0.1037	Not Significant
Skindex Score and Total % Area Affected Score	113	0.5117 Moderately Positive Correlation	< 0.0001	Extremely Significant
Skindex Score and Total Body Surface Area Score	113	0.7356 Moderately Positive Correlation	< 0.0001	Extremely Significant

- **Results**:

i. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Erythema Score but it is not statistically significant.

ii. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Thickness Score and it is statistically significant too.

iii. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Scratching Score and it is statistically significant too.

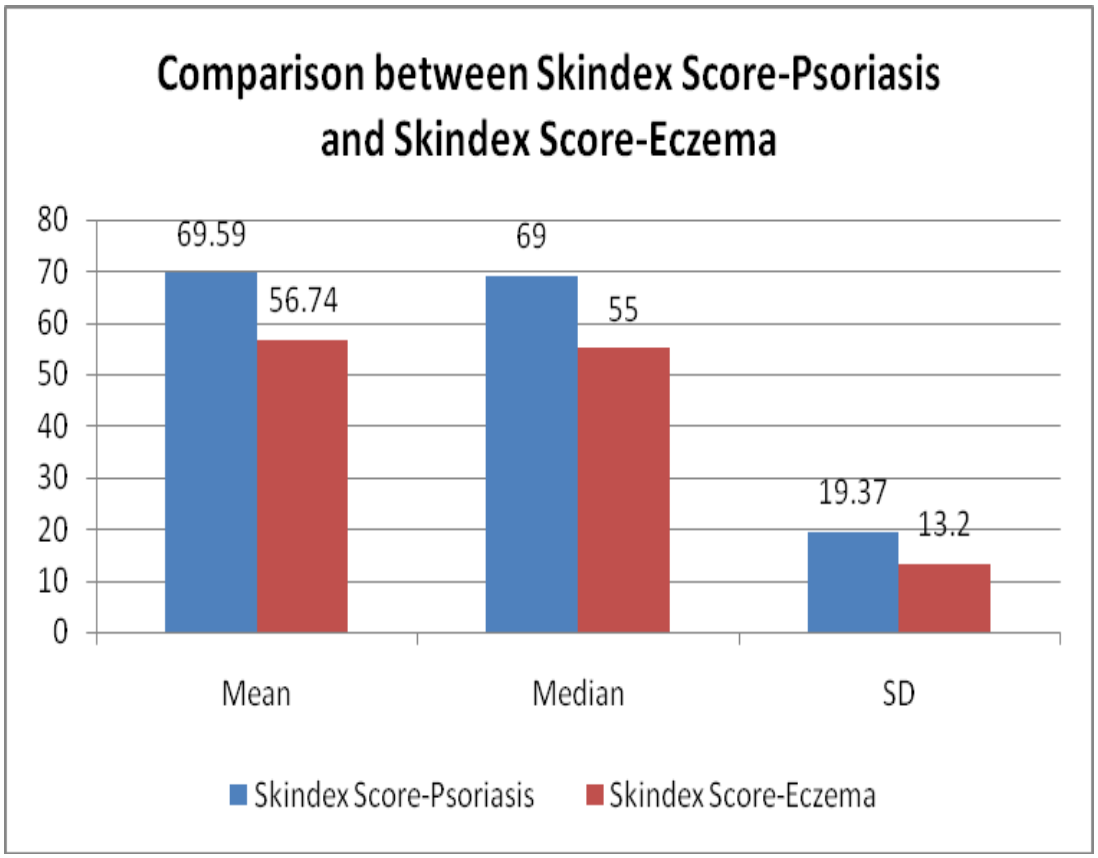
iv. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Lichenification Score but it is not statistically significant.

v. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total % Area Affected Score and it is statistically significant too.

vi. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Body Surface Area Score and it is statistically significant too

Table no. 24 Comparison between Skindex Score-Psoriasis and Skindex Score-Eczema:

	Skindex Score-Psoriasis	Skindex Score-Eczema
Sample Size (n)	**113**	**113**
Mean	69.59	56.74
SD	19.37	13.20
SEM	1.82	1.24
Passed Normality Test?	No	No
Minimum	39.00	36.00
Median	69.00	55.00
Maximum	168.00	124.00



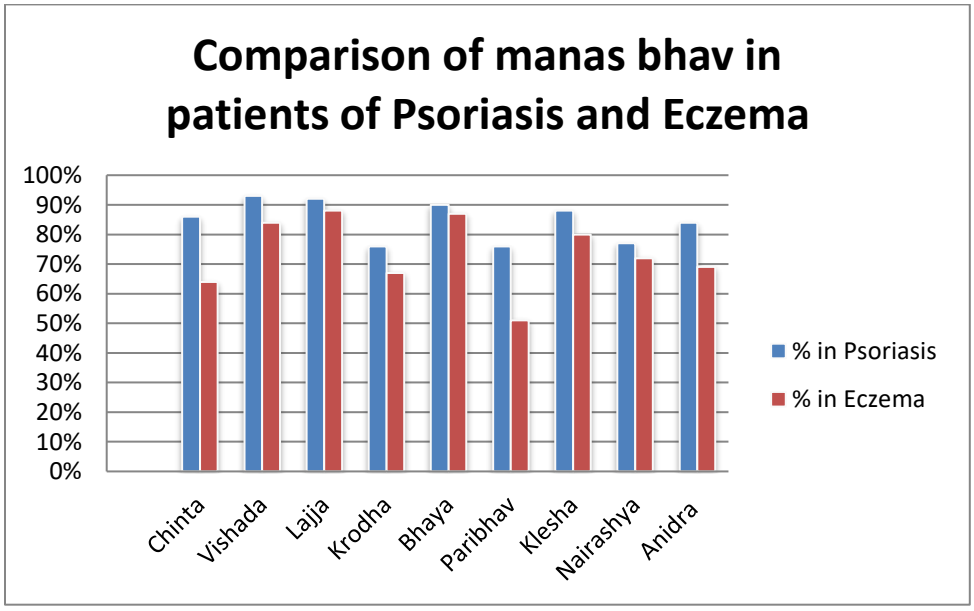
Graph no 15 Comparison between Skindex Psoriasis-Skindex eczema

- **Do the medians of Skindex Score-Psoriasis and Skindex Score-Eczema differ significantly?**
- Mann-Whitney U test (Non-Parametric Test)
- Mann-Whitney U = 3549.0
- U' = 9220.0
- Sum of Ranks - Skindex Score-Psoriasis = 15661
- Sum of Ranks - Skindex Score-Psoriasis = 9990
- **P value: < 0.0001, Extremely Significant**
- **The medians of Skindex Score-Psoriasis and Skindex Score-Eczema differ significantly.**

COMPARISON OF *MANAS BHAAV* IN PSORIASIS AND ECZEMA

Table no. 25 Comparison of manas bhaav in Psoriasis and Eczema

Manas bhaav	**% in Psoriasis**	**% in Eczema**
Chinta	86	64
Vishada	93	84
Lajja	92	88
Krodha	76	67
Bhaya	90	87
Paribhav	76	51
Klesha	88	80
Nairashya	77	72
Anidra	84	69



Graph no. 16 Comparison of manas bhaav in Psoriasis and Eczema

The psychological components from Skindex-29 questionnaire were considered for this assessment. The psychological factors mentioned in the Samhita granthas were linked with the questions assessing mental state.

Questions from Skindex-29	**Psychological factor**
I worry that my skin condition may be serious.	*Chinta*
My skin condition makes me feel depressed.	*Vishada*
I am ashamed of my skin condition.	*Lajja*
I am angry about my skin condition.	*Krodha*
I am embarrassed by my skin condition.	*Bhaya*
I am frustrated by my skin condition.	*Nairashya*
I am humiliated by my skin condition.	*Paribhav*
I am annoyed by my skin condition.	*Klesha*
My skin condition affects how well I sleep	*Anidra*

Table no.26 Skindex-29 questions with associated *manas bhaav*

The comparison of the *manas bhaav* in Psoriasis and Eczema clearly shows that the psychological impact of Psoriasis is more than that of Eczema. Also each psychological factor is affected in a different intensity.

Vishada was seen the most (93%) in Psoriasis patients, followed by lajja (92%) and bhaya (90%). In case of Eczema patients, the same was observed with a lesser intensity, lajja (88%), bhaya (87%) and vishada (84%).

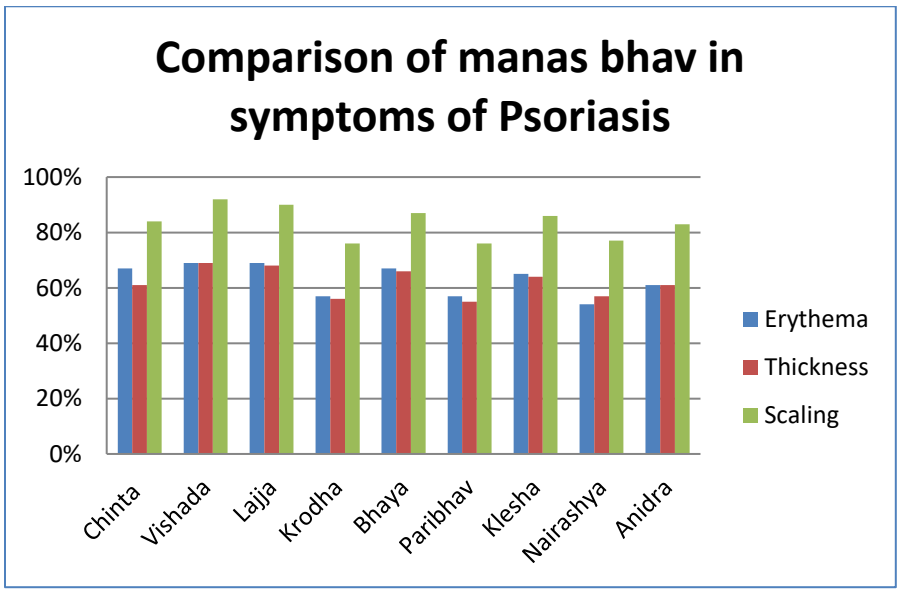
COMPARISON OF SYMPTOMS OF THE SKIN DISEASE WITH PSYCHOLOGICAL FACTORS

Psoriasis:

	Chinta	*Vishada*	*Lajja*	*Krodha*	*Bhaya*	*Paribhav*	*Klesha*	*Nairashya*	*Anidra*
Erythema	67%	69%	69%	57%	67%	57%	65%	54%	61%
Thickness	61%	69%	68%	56%	66%	55%	64%	57%	61%
Scaling	84%	92%	90%	76%	87%	76%	86%	77%	83%

Table no.27 Comparison of psychological factors with PASI symptoms

The symptoms mentioned in PASI assessment scale were compared with the psychological changes or factors. All the symptoms namely; erythema, thickness and scaling showed associated psychological changes. However each of the psychological factors was featured prominently due to scaling. 92% patients exhibited *vishada* with scaling, 90% exhibited *lajja* followed by *bhaya* (87%).

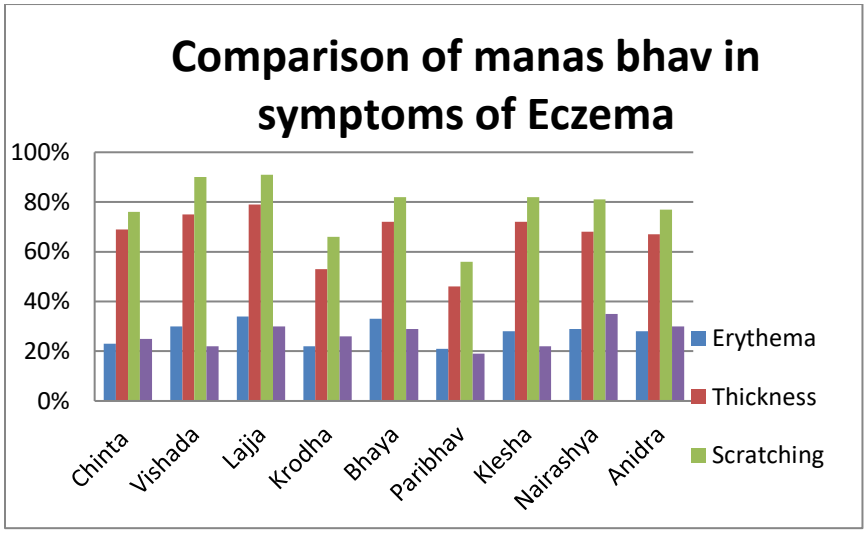


Graph no. 17 Comparison of psychological factors with PASI symptoms

Eczema:

	Chinta	*Vishada*	*Lajja*	*Krodha*	*Bhaya*	*Paribhav*	*Klesha*	*Nairashya*	*Anidra*
Erythema	23%	30%	34%	22%	33%	21%	28%	29%	28%
Thickness	69%	75%	79%	53%	72%	46%	72%	68%	67%
Scratching	76%	90%	91%	66%	82%	56%	82%	81%	77%
Lichenification	25%	22%	30%	26%	29%	19%	22%	35%	30%

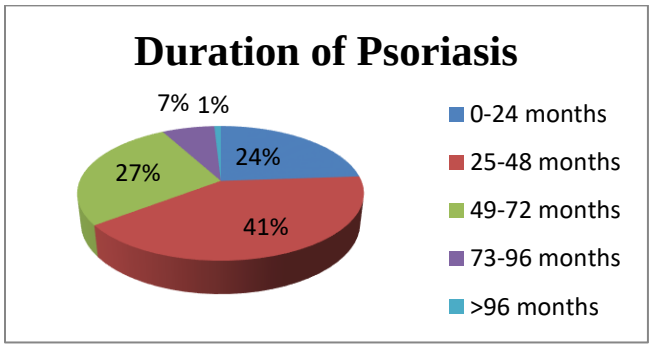
Table no 28 Comparison of psychological factors with EASI symptoms



Graph no. 18 Comparison of psychological factors with EASI symptoms

The symptoms mentioned in EASI assessment scale were compared with the psychological changes or factors. All the symptoms namely; erythema, thickness, scratching and lichenification showed associated psychological changes. However each of the psychological factors was featured prominently due to scratching. 91% patients exhibited *lajja* with scratching, 90% exhibited *vishada* followed by *bhaya* and *klesha* (82%).

DURATION OF PSORIASIS AND SKINDEX-29 SCORE CORRELATION



Graph no.19 Duration of Psoriasis

Spearman rank correlation test is used here.

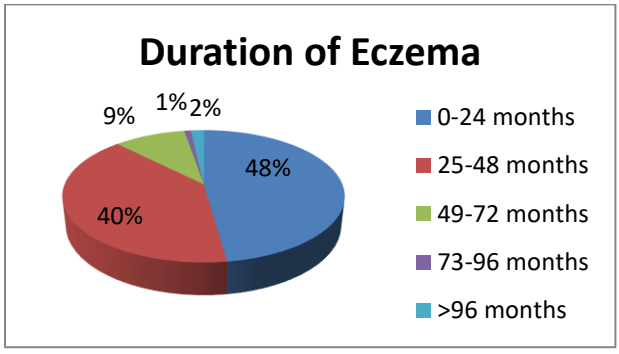
Number of points -113

Spearman r = 0.4083, Type of correlation: Moderately positive correlation

95% confidence interval: 0.2366 to 0.5553

The two-tailed P value is <0.0001, considered extremely significant.

DURATION OF ECZEMA AND SKINDEX-29 SCORE CORRELATION



Graph no.20 Duration of Eczema

Spearman rank correlation test is used here.

Number of points -113

Spearman r = 0.3880, Type of correlation: Moderately positive correlation

95% confidence interval: 0.2137 to 0.5384

The two-tailed P value is <0.0001, considered extremely significant.

DISCUSSION

Importance of the topic

Modern science deals with any disease as purely physical or psychological. With different modernised treatment cropping, still the failure ratio is more. Example: (1) IVF- the sperm and ovum are made to unite without paying much importance to the involvement of 'chetna' factor.

(2) increasing incidence of lifestyle disorders or stress related disorders proves that the body and psyche are inter-related and have a cause-effect relationship. Ayurveda being a holistic science considers the body, mind and soul as a whole. Be it illness or health, this ancient science gives equal importance to these triads of human life.

Until a few years back, the focus of modern medical science was more on physical aspect of health. Only recently the psychological aspect also started gaining importance. Still these two sides of the coin were dealt with separately, until a few recent evidences showed that the body and mind are inter-related. Ayurveda has recognised this relation thousands of years ago. The growing incidences of psychosomatic disorders made the selection of this topic essential

Table No. 25 Discussion on the principle- *te cha vikaaraa parasparamanuvartamana kadachitanubadhnanti*

Sutra	**Meaning**	**Interpretation**
Te che vikaaraa	And these diseases	Infinite diseases concised into sharir and manas
Parasparam	With each other	Somatic to psychological Psychological to somatic Somatic to somatic Psychological to psychological
Anuvartamana	Present along with/together staying for a long time or increasing the strength of each	Chronicity of one disease can give rise to another disease or can increase the severity of co-existing disease. Diabetes slows the healing process of a wound. Emotions like stress give rise to or aggravate diseases like hypertension. Diseases

	Other	like Cancer gives rise to stress, grief and anxiety.
Kadachit	Sometimes	If the disease doesn't stay in the body for long time, then it might not influence the other factors in the body.
Anubadhnati	Are connected	Connection (sharir-manas jwara) or continuity (eg:jwara-raktapitta), act along with each other

The term *kadachit* denotes diseases of greater duration cause greater impact on each other as compared to diseases which stay in the body for lesser duration. As compared to Eczema, Psoriasis is a disease of more chronic nature. The signs and symptoms are also more severe than eczema. Hence the negative impact on the quality of life due to Psoriasis is more than that observed in Eczema.

Differentiation of similar concepts

The quoted principle applies to all the diseases, as explained in the *Chakrapani* commentary. The present quote appears in *Charak Vimaansthana adhyaya 6 Rogaanika vimaanadhyaya* which means group of diseases. A query has been raised about the limited number of *doshas (*three *sharir dosha*, two *manas dosha)* and unlimited diseases, in response to which it is stated that these *doshas* along with seven *dushya* and many causative factors give rise to many diseases. These diseases (*te cha vikaara*) when dwell in the body for a chronic period pave a way or aggravate other diseases, thus making the diseases innumerable. In this process a somatic disease may give rise to a psychological disease and vice versa.

A similar concept is discussed in *Charak Nidaansthana adhyaya 8* as *'Nidanarthkar vyadhi'* wherein it is stated that one disease may act as causative factor of another disease. There is a continuity or aggravation in the pathogenesis (*samprapti*) occurring in the body. Here certain examples like *jwara* and *raktapiita, pratishyaya, kaasa* and *kshaya* are listed. *Grahani, arsha* and *atisaar* is a disease triad that are causative factors of each other. Thus they play a dual role, firstly only disease and second of a causative factor. Certain diseases may subside after creating new one and some may continue along with it. This concept has been discussed in the context of general principles regarding

diagnosis and definition of *shuddha chikitsa.* As this is discussed in *Nidaansthana* its major purpose is to ease diagnosis of disease, as frequently treatment principles depend on the major disease and the sub-ordinate one.

Body and mind relation

Ayurveda is a medical science which is administered on live individuals. So the presence of *chaitanya* factor plays a vital role in any human being. This factor is described by *Aacharya Charak* as *aatma* along with the *manas*. He has quoted that *satva, aatma* and *sharir* are the *tri-danda,* for whom this medical science is dedicated. The amalgamation of these three is very essential for life.

The association of the mind and body are well elucidated in various ancient texts through many instances. In the sacred Bhagwadgeeta, when Arjun went on the battlefield and perceived that he has to fight his own relatives, his mind was wrapped in fear. This state of mind made him lose his strength, mouth dry and made his body shiver. While discussing the characteristics of *kapha- prakruti* and *vata-prakruti* in Ayurveda it is said that they don't get irritated easily and they have unstable temper respectively.

The body constitution is made up of the five basic elements or the *panchmahabhootas*. The food which we eat is also *panchbhautic*. This diet highly influences the mind as well as body. This thoery is well explored in various *upanishads* and also the *Bhagwad geeta*. According to the *Bhagwad geeta,* the type of food we eat influence the *manas bhaavas* of *satva, raja* and *tamas.* According to *Ayurveda* healthy diet boosts the mental endurance or strength. In case of anorexia or such other eating disorders along with the somatic symptoms like weight loss or nutritional deficiencies, psychological symptoms like anxiety, nervousness, loss of confidence, isolation are also distinguished. On the other hand, emotions like fear, stress, anxiety may depress the appetite or cause digestive disturbances.

In the present scenario of Covid-19 we are able to appreciate this inter-relation time and again. The symptoms like cough cold, sneezing or fever are creating great anxiety and fear in the minds of people. Isolation or quarantine due to this disease are having psychological impact on these patients. Anxiety, depression, fear of rejection,

loneliness, anger outbrust is cropping up in these patients. Doctors are advising psychiatric treatment for such patients along with clinical management. Contrary to this situation, there are people who feel they are having sore throat, pain in throat, fever as a result of the panic situation and fear about Covid-19 present in their minds.

According to Ayurveda, the process of conception involves the union of sperm and ovum in the presence of *chetna* factor which is soul along with psyche. The occurrence of infertility is on rise now-a-days. Apart from the male or female reproductive system disturbances, today's lifestyle is distorted by stress, anxiety, fear and other emotional disturbances. Aacharya Charak has already documented these factors. A happy and peaceful mind is helpful for retention of conception and a disturbed or diminished virility is outcome of unhappy mind. In such cases if psychological treatment like meditation or drug therapy is included, it gives better results. There is no affirmation about the cause-effect direction regarding stress and infertility but still both can have an impact on each other.

Health is described as a perfect balance of healthy body, mind and soul. Similarly body and mind are the two seats of disease conditions as explained in Ayurveda. Certain diseases like joint disorders are only physical, certain diseases like depression are psychological but few diseases are psychosomatic like *unmada* having both components. But even if a disease is only physical or only psychological they tend to affect the other component in long run. Depression may show symptoms like loss of appetite, insomnia, muscle cramps, weight loss etc. On the contrary certain chronic like Cancer or acute and severe infections like Covid-19 may produce signs of depression.

Aacharya Charak has clearly stated this theory in *Jwarachikitsa-adhyaya*. The mental factors like lust, sorrow, fear vitiate the physiological component, *vayu* whereas anger vitiates *pitta dosha. Vataja grahani* exhibits the symptoms of desire for all types of tastes (*ras*) and a feeling of dejection. *Atisaar* is a disease having physical symptoms but amongst its causative factors are mentioned fear and sorrow. The treatment is appeasement and assurance. The causative factor for *dwishtarthja chardi* is smell or sight of dirty, putrid, filthy things or things which are not comfortable to ones likings. The treatment is doing things which are in liking with the person along with assurance

and appeasement. We observe these instances about sudden fear or stress giving rise to diarrhoea or nausea-vomitting along with other symptoms like giddiness, palpitations, headache, numbness etc.. Chronic elevated stress levels may give rise to Irritable Bowel syndrome, fatigue, insomnia, weight loss and other health disorders.

It is clearly stated that depression or sadness is a major cause of aggravating diseases. We observe this in many diseases like Cancer. Strong willed patients and those with a positive attitude tend to respond better and may prolong the re-occurrence of the disease. On the other hand, depressed patients worry about the outcome of the disease or the side-effects of treatment or may not respond well to the treatment. Chronic and continuous stress puts our body in a incessant flight or fright mechanism, which gives the body no time to recover, which may worsen the immune mechanism.

Hence we can see that sufficient evidence can be obtained which prove that the body and mind are always in association with each other and that they are inseparable. They respond to each other. Even the ancient science of Yoga emphasizes in uniting these three components namely- body, mind and soul.

Importance of skin

Skin is the presenting organ of the body. The status of skin highly decides the approach of the society towards the individual. Presence of blisters, blemishes or any type of disfigurement on skin sends a repulsive feeling in the mind of the society. Also the psychological status, confidence of the individual is largely dependent on the quality of skin ie the external appearance of the individual. They tend to conceal themselves from other people with feelings of shame, awkwardness, fear, disgust and anger about their own condition further aiding to diminish his/her confidence. A routinely found example is of acne in case of teenagers.

Skin and mind

It is clear from the above discussion that skin and mind are in association. In modern medicine a new domain called psychodermatology is developing. It deals with the treatment of skin diseases using psychiatric techniques. It attempts to connect the intrinsic invisible factor of mind and the external visible disorders of skin. This interaction is explained by the release of mediators by neuro-endocrine and immune

system of the body. One of the hormones is cortisol. It is known for its flight or fight mechanism. It is secreted by the adrenals when the body is in any stressful situation. Excess secretion of this cortisol leads to inflammation, dryness, aging signs and redness in the skin. In Ayurveda, abyanga (massage) elevates the levels of serotonin and dopamine in the body and decreases cortisol. This oil massage therapy which is administered on skin produces a feeling of wellbeing in the mind.

Other evidences suggesting the relation of skin and mind are:

- The skin is considered as a expression of the quality of *ras-dhatu*. A *ras-saar* person is also called as *twak-saar*. One of the factors of *rasa-vaha srotas dushti* is *chintyanam cha atichintanaat* ie mental stress and worries. So if the *rasa-vaha srotas* is vitiated due to mental stress it will reflect on the quality of the skin.
- The *mool-sthana* of *rasa-vaha srotas* is the heart (hridaya). When the *rasavaha* channels are vitiated the heart also gets affected. The heart is a seat of *rasa-vaha srotas* as well as the *manas.* Hence *ras-ashrayi* disorders also affect the *manas*. When liquids like *mantha, paanak (tarpan)*are administered to a thirsty person it also creates a sense of satisfaction in the mind. These liquids comprise mainly of *madhura-amla* tastes. *Aacharya Charak* has quoted *amla rasa* as excellent for the heart. Hereby we can see that skin and mind are connected.
- *Ras-dhatu* is a fluid or flowing *dhatu*. Obstruction to its flow results in various diseases. The *tama-dosha* of the *manas* is also *avasadak* or obstructive in nature effect of which is psychological or mental disorders.
- Another channel connected with the skin is *swedavaha srotas*. The psychological sentiments like anger, sorrow and fear effect the *swedavaha srotas.*These emotions may effect the skin if present incessantly.
- Good quality sleep is one of the benefits of *abhyang* (oil massage), a treatment which is performed on skin (body).
    - In embryonic life skin development occurs from ectoderm while CNS also develops from ectoderm. Both tissues have the same origin hence the disease producing factors may be the same.

- The skin plays a key role as a sensory organ in socialization processes through the whole life cycle. It responds to emotional stimuli, and its appearance to a great extent influences body image and self-esteem. Not surprisingly, a relationship between psychological factors and skin diseases has long been observed.
- The psychosocial and occupational impact of skin diseases is comparable to other chronic medical conditions. These depressing effects can in due course compromise overall quality of life.
- Psychodermatology is already discussed in Ayurveda. *Aacharya Charak* has clearly quoted that the skin or the *sparshan-indriya* is *cheta-samvayi. Samavaya* means inseparable or closely associated. Skin occupies all the other sense organs. So *manas* stays along with the *sparshan-indriya* to gain knowledge from all other sense organs.

PROBABLE MECHANISM OF PSYCHOLOGICAL CHANGES IN PSORIASIS AND ECZEMA

There are many references regarding the effect of psychological factors on the body, mentioned in the *Samhita granthas*. However, there are very few references which suggest the opposite. In this study, it is clearly observed that somatic diseases induce changes in the mind also. Here are a few probable mechanisms which explain these changes.

Psoriasis and Eczema (skin diseases) involves the involvement (vitiation) of all the three *doshas*. As the *tridoshas* and *manas doshas* are interrelated, involvement of *rajas* and *tamas* is an expected occurrence.

Symptoms in PASI (Psoriasis)	**Symptoms in *Samhitas***	***Sharir Dosha* involvement**	**Asso. Psychological factors**
Erythema	*Raag*	*Pitta*	*Krodha, klesha, shoka, paribhav*
Thickening	*Kathinya*	*Vaat*	*Lajja, bhaya, shoka, vishada*
Scaling	*Bhedan, Parushya*	*Vaat*	*Vishada, lajja, bhaya, klesha*

Table no.30 Probable associated *manas bhav* in symptoms of Psoriasis

Symptoms in EASI (Eczema)	**Symptoms in *Samhitas***	***Sharir Dosha* involvement**	**Asso. Psychological factors**
Erythema	*Raag*	*Pitta*	*Krodha, klesha, shoka, paribhav*
Thickening	*Kathinya*	*Vaat*	*Lajja, bhaya, shoka, vishada*
Scratching	*Kandu, bhedan, srava*	*Tridosha*	*Lajja, vishada, krodha, klesha*
Lichenification	*Kathinya*	*Vaat*	*Bhaya, shoka, vishada*

Table no.31 Probable associated *manas bhav* in symptoms of Eczema

The Samhita granthas have described various types of psychological factors along with their meaning or method of diagnosis. These definitions pave a way to assemble the probable pathogenesis of these psychological changes in somatic diseases.

1. ***Vishada*** – It is defined as *Apravrutti* or reluctance to perform any action due to the fear of failures in *Nibandhsangraha* commentary of *Sushruta sutrasthana* 1/25. *Apravrutti* is a symptom of *tamas dosha*. Also it is explained by *Aacharya Charak* that *Vatakshaya* causes decrease in *utsaah* (desire to work/zeal) which leads to increase in *vishada* in *Chakrapani* commentary of *Charak sutrasthana*

19/52. However, *vishada* is also mentioned in the *vaataj nanatmaj vyadhi* and also in symptoms of *vaat jwara.*

Vishada is observed in the severe stages of the skin disease, where there might be a vitiation of both *vaat* and *kapha*, making it difficult to cure.

In scratching/ itching:

- *Kaphadushti* ⟶ *tama dushti* ⟶ *apravrutti* ⟶ *vishada*
- *Vatakshaya* ⟶ *utsaah kshaya* ⟶ *vishada*
- *Vaat prakop* ⟶ *vishada*

2. ***Krodha*** – *Pitta dosha* is vitiated by *krodha*[226]. But *krodha* is also a symptom seen in many *pittaja* diseases. *Pittadushti* has *anubandh* of *vaatadushti* leading to *rajadushti* giving rise to *krodha.*

In erythema:

- Pitta dushti + vaatanubandh ⟶ rajadushti ⟶ krodha

3. **Shoka** - *Vaat* is vitiated by *kaam, bhaya* and *shoka*[226]. *Shoka* is also explained *chetasah santap* by Ashtang Hridaya chikitsasthana 4/56, Sarvangasundar commentary , which marks the involvement of *pitta* also. Hence the vitiation of *pitta* and *vaat* leads to *rajadushti* giving rise to *shoka*.

In all symptoms:

- *Vaatdushti* + *pittanubandh* ⟶ *rajadushti* ⟶ *shoka*

4. **Bhaya** - *Vaat* is vitiated by *kaam, bhaya* and *shoka*[226]. However in the *Chakrapani Commentary* of *Charak sutrasthana* 8/5, it is stated that when the mind becomes vitiated by *tamas dosha, bhaya* is developed. Also the method to diagnose *bhaya* is observing *vishada*[177], which as explained above occurs due to *tamadushti*.

Also *shourya* (courage) is the function of *pitta dosha*[227]. In *pittadushti, shourya* being vitiated can give rise to *bhaya or dainya*.

In scratching, scaling, itching-

Kapha dushti ⟶ tamodbhav ⟶ bhaya ⟶ vaatprakop ⟶ scaling

5. ***Dainya*** – Dainya is described as *klishta chittata,* which implies tormented or distressed mind. It can occur due to *shoka* or *bhaya* as explained in *Charak sutrasthana* 7/27, *Chakrapani* commentary. Hence *dainya* can be due to *rajodushti* or *tamadushti.*

Also *shourya* (courage) is the function of *pitta dosha*. In *pittadushti, shourya* being vitiated can give rise to *bhaya or dainya*.

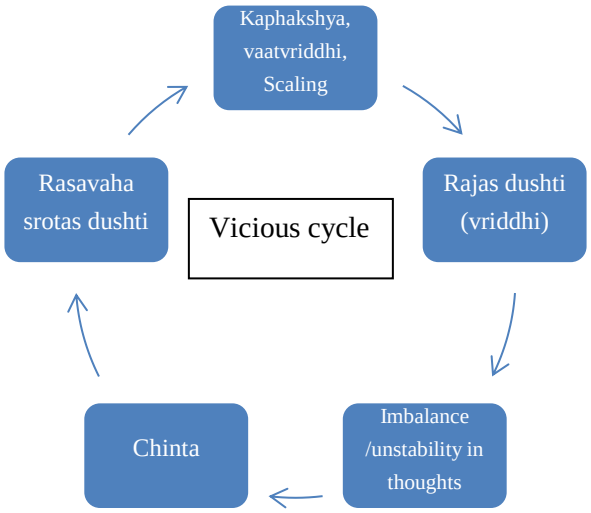
6. ***Paribhav*** – It is described as humiliation or disgrace. According to *Ashtang Hridaya* 2/24, *Sarvangsundara tika , paribhav* means feeling disgraced due to the rude or unkind comments of others. The patients of skin disease experience this many times due to unkind behavior of the society. *Apamaan* is the synonym for *paribhav*. *Apamaan* is explained as *asatkaar* or *tiraskaar*, in *Ashtang Hridaya* 2/27, *Sarvangsundara* commentary. Feeling of self respect or *maan* is the function of *pitta dosha*. Hence feeling of disgrace also is the function of pitta. This particular psychological factor is usually expressed during interaction with society.

- *Parusha vachan* ⟶ *klesha* ⟶ *pitta prakopa* ⟶ *paribhav*

7. ***Chinta***- Overthinking is a causative factor of *rasavaha srotas dushti*[33]. *Rasa* and *kapha*, being similar to each other[228], it implies *kaphadushti (kshaya)* also. *Sthiratvam* and *kshama* are the functions of *kapha*[227]. *Sthiratvam* not only implies a strong body, but it also indicates a stable and composed mind. *Kshama (kshanti)* means endurance or tolerance. When the mind is worried, it looses its stability to think methodically. As it is not able to tolerate or endure difficult situations (here- appearance of skin), and becomes panicky. Hence we can say *kaphadushti (kshaya)* and *vaatvriddhi* leads to an imbalance in *rajas* and *tamas* developing the symptom of *chinta*.

It can also be observed here that *chinta* can further act as an aggravating factor in the pathology of skin disease as it is the *hetu* of *rasavaha srotas dushti*.

In thickening, scaling, lichenification:



8. **Klesha**- *Klesha* is termed as *pida* in *Ashtang Hridaya* 13/21, *Sarvangasundara* commentary. It is frequently used in the *Samhita granthas* in relation with enduring hardships/troubles. The symptom in *rasavaha srotodushti* is *asahishnuta*[32] which can be inferred as *klesha.*

- Rasavaha srotodushti ⟶ asahishnuta ⟶ vaatavriddhi kaphakshaya ⟶ rajodushti ⟶ klesha

- **Nairashya –** It means *niraag*, ie devoid of any *aasha* or hopes, as described in *Chakrapani* commentary of *Charak sharirsthana* 1/3. The effect of *tamodushti* can be observed here as *tamas* is *avasadak* in nature.

- Kaphadushti⟶tamodushti ⟶diminished body and mind energy ⟶loss of hope ⟶nairashya

9. **Anidra**- Loss of sleep or disturbed sleep attributes to vaat and pitta vitiation. Rajas dushti occurs leading to Anidra.

- Vaat vriddhi, pitta vriddhi ⟶ rajodushti ⟶ anidra

About present study

The present study was undertaken to highlight the psychological effects during the course of Psoriasis and Eczema.

Choice of Psoriasis and Eczema for the present study:

- Both are skin diseases.
- In both the diseases, disfigurement, symptoms like itching causing discomfort are common.
- Psoriasis and Eczema, both may affect the presenting areas of the body, e. g. Face, hands, feet etc.
- Both may be hereditary in nature.
- Psoriasis and Eczema may spread from one body part to another.
- Both these diseases can occur in age groups ofpatients.
- Both diseases are chronic in nature.
- These diseases are of medical significance ie they cannot be resolved with home remedies only and require medical intervention.

Questionnaires namely PASI, EASI and Skindex-29 were used to assess the effect of skin disease on the mental health and the quality of life of the subject. It was also studied if the intensity and type of symptoms and severity of the somatic disease has any role in the level of psychologicalchanges.

PASI and EASI

In clinical practice, mostly the progress of psoriasis or eczema is judged subjectively based on patients' responses and physician's observations. However in clinical trials or studies, an objective measurement is required which is consistent and reliable. The signs and symptoms of these skin diseases need to be quantified to get a proper picture regarding diagnosis or prognosis. There are many assessment tools to calculate the severity of these diseases. PSGA

(Physician Static Global Assessment), OLA (Overall Lesion Assessment), PASI are the various scales used for assessing psoriasis. NPSI (Nail Psoriasis Severity Index) and PSSI (Scalp Psoriasis Severity Index) are designed for localised lesions. SCORAD (Scoring Atopic Dermatitis), ADSI (Atopic Dermatitis Severity Index), EASI are the scales for assessing eczema. Amongst these PASI (for Psoriasis) and EASI (for Eczema) are considered as gold standards for assessment. Furthermore these two scales were selected for the study due to the similarity in assessment objectives. The severity of lesions in these diseases was calculated depending on the area affected in a single score from 0 to 72. The body was divided into 4 regions- head (10%), arms (20%), trunk(30%) and legs (40%). Each of the regions were assessed for the symptoms of erythema, induration, scaling (desquamation) in case of Psoriasis and licenification along with the other symptoms in case of eczema. In each of the regions involved area score in terms of percentage and grading from 0 to 6 was measured. Both these scores were multiplied. These obtained scores were then multiplied with 0.1, 0.2, 0.3 and 0.4 for head, upper limbs, trunk and lower limbs respectively. Both these scales measure the extent and severity of the disease. However the responses of the patient are not recorded in these scales. Hence a scale for measuring quality of life of the patient was required.

Skindex questionnaire:

Skindex is a mental assessment tool for patients with skin disease developed by Chren MM and distributed by Mapi Research Trust. There are two variations of Skindex questionnaire, Skindex- 16 and Skindex-29. Skindex-29 is more comprehensive as regards assessment of effect of skin disease.

There are 7 questions from physical symptom sphere, 10 questions from emotional sphere and 12 questions from functioning (social) sphere. The effects of skin disease are physical, psychological and social. The physical effects may include pain, itching, discomfort or limitations in performing actions. The sphere of emotional symptoms is huge including mental discomfort, fear, embarrassment, depression, anxiety, anger towards the disease, worry, apprehension, and irritation as per the mental strength of the patient. The social effects are two-way ie the patients attitude towards the society (which largely depends on his/her physical and mental status) and the society's attitude towards the patient.

Merits of Skindex-29:

1. Comprehensive, can test various aspects of the patient of skin disease
2. Various levels of emotions are assessed eg. Humiliated, embarressed, ashamed; angry and annoyed Humiliation- stronger emotion that can result in hurt feelings and cannot be ignored easily.

   Embarrassment- laughed at by or made fun of. It includes what people think of you Ashamed- it is the feeling what you think about yourself with some amount of guilt Angry- strong feeling of unhappiness towards something, frequently combined with urge to harm

   Annoy- feeling of discomfort caused by what one dislikes

Demerits of Skindex-29-

Patient sometimes does not feel comfortable relieving his/her mental status or family interactions.

Also patients sometimes don't understand the difference between the terms like

humiliation, embarrassment and ashamed. These terms have to be explained to the patients in their words.

In *Ayurveda*, there is a concept of *guru-vyadhit* and *laghu-vyadhit*. According to this concept, there is a possibility that less severe type of disease may have more impact on the mind and emotions due to weak psychological endurance and opposite may happen in patients having strong psychological strength.

DEMOGRAPHIC DETAILS

- Out of the 113 subjects of Psoriasis, 78 study subjects (69 %) were males, while 35 study subjects (31 %) were females. Out of 113 patients of Eczema, 65 subjects (58 %) were males, while 48 subjects (42 %) were females. Psoriasis and Eczema, both skin disorders were found to be more prevalent in males compared to females.
- Out of the 113 subjects of Psoriasis, 32 study subjects (28 %) were from age group 15-30 years, 49 study subjects (44 %), were from age group 31-45 years and 32 study subjects (28%) were from age group 46-60 years. Out of 113 patients of Eczema, 28 subjects (25 %) were from age group of 15-30 years. 54 subjects (48 %) were from age group of 31-45 years. While, 31 subjects (27 %) were from age group of 46-60 years. Both the skin disorders were found to be more prevalent in age group 31-45 years. The age group of 31- 45 years can be considered as more stressful with respect to career, family responsibilities, etc. Also many lifestyle changes, wrong dietary habits are present in this age group. According to *Ayurveda* , this age group comes under *madhyam vaya*, where there is predominance of *pitta dosha*. *Pitta dosha* and *rakta dhatu* have *ashraya-ashrayi* relation and aggravated *pitta* tends to cause *rakta-ashrayi* diseases which includes various skin disorders.
- Out of 113 subjects of psoriasis, 16 subjects (14 %) were educated till SSC level; 25 subjects (22 %) were educated till HSC level; 69 subjects (61 %) were graduate, while 3 subjects (3%) were post graduate by education. Out of total 113 patients of eczema, 18 subjects (16%) were educated till SSC level. 24 subjects (21 %) were educated till HSC level. 64 subjects (57 %) were graduates, while 7 subjects (6 %)

were studied till post-graduation. Most of the patients suffering from Psoriasis and Eczema were graduate by education. The people with graduation degrees might be more socially active and doing corporate jobs where general appearance of a person plays significant role in career development.

- Out of total 113 patients of psoriasis, 101 subjects (89%) belonged to Hindu religion.10 subjects (9%) were Muslim, while 2 subjects (2 %) were Christian by religion.Out of 113 patients of eczema, 104 subjects (92 %) were Hindu and 9 subjects (8%) subjects were Muslim by religion. No conclusion can be drawn from this data as the study center draws patients from Hindu dominant locality.

- Out of total 113 subjects, 56 study subjects (49 %) were having service as occupation.18 subjects (16 %) were having business as occupation. 24 subjects (21 %) were housewives. 12 subjects (11 %) were students. 3 subjects (3 %) were retired, while none were unemployed. Out of 113 subjects of Eczema, 49 subjects (44 %) were having service as occupation. 21 subjects (19 %) were having Business as occupation. 25 Subjects (22 %) were housewives. 15 subjects (13 %) were students. 1 subject (1 %) was retired, while 1 subject (1 %) was unemployed. Most of the patients in both the groups were having service as occupation. This may be related to stress and lifestyle changes. Also physical appearance plays a vital role at workplace. Working in AC environment daily for long durations interferes with the functioning of *Swedavaha srotas* and in turn causes various skin disorders.

- Out of total 113 patients of Psoriasis, 40 subjects (35 %) were having some kind of addictions, while 73 subjects (65 %) did not have any addictions. Out of total 113 patients of eczema, 22 subjects (19 %) were having some kind of addictions, while 91 subjects (81 %) did not have any addictions. No role of addiction in skin disorders have been identified in this study.

DISCUSSION ON OBSERVATIONS

For grading Psoriasis, PASI scale has been used. It employs 3 symptoms of Psoriasis for calculation namely- erythema, thickening and scaling. These symptoms may be co-related with the symptoms of *kitibha- shyav varna, kinkhar sparsha* and *paarushya.*

For grading Eczema, EASI scale has been used. It employs 4 symptoms of Eczema for calculation namely- erythema, thickening, scratching and lichenification. These

symptoms may be co-related with the symptoms of *vicharchika- kandu (Charak samhita),ati-ruja, ruksha* and *raji(Sushrut Samhita)*.

The factors involved in the pathology (*dushya)* of *kushtha (kitibha)* and *visarpa* are identical. The symptoms of both manifest on the skin and are *prasaranshil* ie they tend to spread all over the body. Hence we find that certain symptoms are also similar. In *vataja visarpa* we find '*arun- aabhas shwayathumaan'* which means swelling which is reddish in colour or inflammation. It also mentions '*sheeghrabhedi sphotaka, tanu, arun-shaav, alpa sraava'* which may be compared to the scaly nature of Psoriasis and the bleeding points on removal of scales. Division of cells is a function of *vata-dosha* whereas uncontrolled division, which explains the thickening and scaly nature of Psoriasis is the effect of vitiated *vaat-dosha*. In *pittaja visarpa* , '*tamra varna,utsedh'* meaning erythema and swelling or thickening, which are also visible in Psorisis. In *kaphaja visarpa, 'pandu-na-atirakta* and *chirkari'* are mentioned similar to greyish scales and chronic nature of Psoriasis. *Kushtha* is also a disease involving all the 3 *doshas.* We can say that the symptoms of Psorisis correlate with the vitiated actions of the three doshas. Previously we have discussed the relation between the three *doshas* and the psychological factors like anger, agony, sorrow, fear etc. Hence it can be said that vitiation of all the three *doshas* vitiates the body and mind also. This extent of vitiation is calculated as PASI score for body and Skindex-score for mind. These are directly proportional as both scores show moderate positive correlation with each other as per this study. The same concept of inter-relation of vitiated *sharir doshas* and vitiated *manas doshas* regarding another disease can be a topic for further research.

Relation between Skindex score and PASI score

There is a moderately positive correlation ($0 \leq r \leq 1$) Skindex Score-Psoriasis and PASI score and it is statistically significant too. The final PASI score is calculated by measuring the gradations of symptoms like erythema, thickness and scaling and the affected area. Hence the total score depends upon these individual scores.

Relation between Skindex score and Psoriasis symptoms

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-

Psoriasis and Total Erythema score and it is statistically significant too.

The rate of cell proliferation increases many fold and there is noticeable inflammation. Capillaries proliferate at this level giving rise to erythema. The mere sight of redness or bleeding makes many people feel sick. Sometimes the bleeding points underneath the inflammed skin may cause pain. The inflammed and reddened skin tend to invite questions from the onlookers giving rise to discomfort and a feeling of agony in the patient. Hence the symptom of erythema present in Psoriasis affected the skindex score significantly. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score- Psoriasis and Total Thickness score but it is not statistically significant.

Thickened skin in Psoriasis can be greyish white in colour, closely resembling dryness of skin or an old scar. These conditions which are commonly found in the society do not catch much attention. Also there is not much pain or discomfort involved in thickened skin, from the patient's point of view. Hence the symptom of thickened skin in Psoriasis did not affect the Skindex score significantly.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total Scaling score and it is statistically significant too.

Patient is a lot perturbed by the extreme scaling of the skin. It produces dandruff – like flakes on clothes. When the skin is involved to a large extent, they find it discomforting to come together with friends or relatives. Some might go to an extent of carrying a dust pan and brush with them. Still it causes a great deal of discomfort to the patient as there is continuous collection of these scales or flakes. Also the sight of a scaly skin causes aversion in the minds of the society. Hence the symptom of scaling present in Psoriasis affected the skindex score significantly.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total % Area Affected Score and it is statistically significant too.

For calculating the area affected the PREPI method (Patient Report of Extent of Psoriasis Involvement was used. The patient's palm was used to calculate the approximate area affected by the disease. In PASI the body is divided into 4 regions

namely- head, upper limbs, trunk and lower limbs. It is observed that if the exposed area like face, neck, hands are affected, then the psychological impact is more because the lesions are easily visible to others.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Psoriasis and Total Body Surface Area Score and it is statistically significant too.

Relation between Skindex score and EASI score

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and EASI score and it is statistically significant too. The final EASI score is calculated by measuring the gradations of symptoms like erythema, thickness/induration, scratching and lichenification and the affected area. Hence the total score depends upon these individual scores.

Relation between Skindex score and Eczema symptoms

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Erythema Score but it is not statistically significant.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Thickness Score and it is statistically significant too.

The itchy skin becomes thick and leathery and sometimes hard like the bark of a tree or leather like appearance. The skin marking also become considerably prominent. The lesions of eczema are usually present on exposed areas like the fingers, elbow joint, toes, ankle joint, nape of neck, chin or beard area which makes it very obvious to the onlooker. This gives a sense of fear, insecurity and reluctance in the patient.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Scratching Score and it is statistically significant too.

This is the distinguishing symptom of eczema. It is also called the itch that rashes. An itch-scratch cycle is developed. Excessive itching leads to scratching of skin, damaging the skin barrier. There is loss of water through this damage leading to dryness of skin. Also breaking this barrier leads to entry of irritants or bacteria. The inflammatory enzymes are secreted by the mast cells which further increase inflammation and itching

and the cycle goes on. The patient finds it difficult to break this cycle and embarassing to scratch in front of others, as it becomes socially inacceptable to scratch continuously. Further this stress or anxiety may aggravate the feel to itch leaving the patient helpless.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Lichenification Score but it is not statistically significant.

Lichenification is thickened and leathery looking skin formed as a result of continuous and chronic scratching. It is developed in later stages of the disease. In the present study lichenification was not developed in all cases. It was seen only only in chronic cases or in cases where scratching was severe. A separate study involving chronic cases of eczema to assess the relation of lichenification and psychological effects can be considered for further study.

There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total % Area Affected Score and it is statistically significant too.

For calculating the area affected the PREPI method (Patient Report of Extent of Psoriasis Involvement used in Psoriasis was used here also. The patient's palm was used to calculate the approximate area affected by the disease. In EASI the body is divided into 4 regions namely- head, upper limbs, trunk and lower limbs. It is observed that if the exposed area like face, neck, hands is affected, then the psychological impact is more because the lesions are easily visible to others. Also if the total affected area is more, it may increase the distress due to the overall symptoms. There is a moderately positive correlation ($0 \leq r \leq 1$) between Skindex Score-Eczema and Total Body Surface Area Score and it is statistically significant too.

COMPARISON BETWEEN SKINDEX SCORE-PSORIASIS AND SKINDEX SCORE-ECZEMA:

The skindex scores for Psoriasis and Eczema were compared using Mann-Whitney U test (Non-Parametric Test). The sum of ranks of Skindex Score-Psoriasis is 15661 and sum of ranks of Skindex Score-Eczema is 9990. Mann-Whitney U is 3549.0 and U' is 9220.0.

The psychological impact of Psoriasis is greater than that of Eczema. Psoriasis is a disease with chronic history and a rapid progression as compared to Eczema. Also the scaly nature of the lesions, erythema of skin creates a negative impact on the patient as well as the society. The dandruff like flakes continuously falling on neck, clothes, etc further aggravates this condition. The disease spread throughout the body happens at a fast rate. Along with that many complications like Psoriatic arthritis make life worse for the patient. If Psoriasis is affecting the areas like palms, it causes pain to the patient in carrying out day-to-day activities. Sunrays especially during noon tend to cause burning sensation and aggravate Psoriasis. The recurrence rate is also more in Psoriasis. As a result the patient, even if cured, remains under continuous threat of the symptoms reappearing again. On the other hand the progression of eczema is comparatively slow. The main symptom of itching may be masked at times with anti-histamine drugs. Also the spread of the disease is limited to the joints, feet or fingers and less frequently affecting the face or neck.

Skin is the first presenting organ of the body and highly responsible for the self-esteem and self-confidence of the individual. Hence diseases of skin of any magnitude and severity affect the psychological status of the patient. The 5 Ds as already discussed in review of literature- Disfigurement, Discomfort, Disablement, Depression and Death are seen in various types of skin disorders. In Psoriais and Eczema the first 4 Ds are commonly observed. Death is rare due to these diseases. Still the 4Ds are more noticeable in case of Psoriasis than Eczema. Hence we can say that the psychological impact of Psoriasis is greater than that of Eczema.

Limitations of study:

The psychological changes in a certain individual also depend on the prakruti and sattva of the individual. These factors also should be taken into consideration.

Thought for further research:

The current study has undoubtedly proved that there is a certain impact of skin diseases on the psychology of the patient. However *Ayurveda* examines the patient based on parameters like *prakruti, saar, manas prakruti* etc. Also there is a concept of *laghu vyadhit-guru vyadhit*. These parameters may interfere in the severity of the psychological impact of the skin disease of individuals. Hence the comparision of Skindex score with these parameters can be a thought for further study.

As the study was concluded over a small sample, a similar study performed over a large sample with coverage of larger geographical area and probability sampling techniques would have procured much sharper and more accurate results.

More advance tools to assess quality of life (QoL) of such patients can be used.

CONCLUSIONS

The present study entitled, "**STUDY OF COMPARATIVE PSYCHOLOGICAL CHANGES IN PSORIASIS AND ECZEMA**" the study has been discussed on the basis of concepts, supported by data and rational reasoning. The conclusions drawn from the scientific discussion are as follows:

- Somatic or psychological disease, if present in the body or mind, for a longer duration may influence or aggravate the other disease (somatic or psychological).
- Psoriasis and Eczema (somatic diseases) lead to psychological symptoms such as anxiety, stress or depression. Also these emotional factors aggravate the symptoms of Psoriasis and Eczema.
- The comparison of Skindex scores of Psoriasis and Eczema indicates that Psoriasis exerts more psychological stress on patients compared to that of Eczema. As the severity of skin diseases like Psoriasis and Eczema increase, quality of life is affected inversely.

SUMMARY

The present study entitled "**STUDY OF COMPARATIVE PSYCHOLOGICAL CHANGES IN PSORIASIS AND ECZEMA**" consist of chapters, viz.

- Introduction
- Aim & Objectives
- Review of Literature
- Materials & Methods
- Observations and Results
- Discussion
- Conclusion and summary

- **Introduction** gives a general idea about interrelation of body and mind as explained in the Samhitas, psycho-dermatology, *Kushtharoga* and skin disorders especially Psoriasis and Eczema, the psychological effects during the course of skin diseases, importance of the topic in present time and need of this study.
- The **Aims & Objectives** part describes aim and the objectives of the present study as well as the research question. The main aim of the study was to compare the psychological changes caused due to Psoriasis and Eczema on the basis of the concept-*'te cha vikaaraa parasparamanuvartamana kadachitanubadhnanati'.* The objectives were designed to study the concept (*siddhanta*), to assess the correlation between Psoriasis and Eczema (somatic diseases) with psychological changes in those patients. Along with this the effect of Psoriasis and Eczema on the quality of life was studied and compared with each other.
- The **research questions** were to see if there is a correlation between severity of somatic diseases and psychological health of the patients as per the

siddhant and if there is a significant difference in quality of life of patients suffering from Psoriasis when compared with patients suffering from Eczema.

- **Review of literature** part covers Intergral relation between *sharir* and *manas, Twak Sharir*, Integumentary System, Psoriasis and *Kitibha Kushtha*, Eczema and *Vicharchika, Manasika Bhava* (Psychological aspects) of skin diseases, *Twacha* as *Manas Vyadhi Adhishthana.*

- The **Materials and Methods** chapter discusses literature review materials, the data collection tools and detailed plan of selection of patients, plan of action along with plan for statistical analysis of data.

- In this cross-sectional study 113 patients each of Psoriasis and Eczema were selected by Convenience (non – probability) sample selection method. The data was collected from the study participants with the help of PASI, EASI and Skindex-29. The effect of severity of Psoriasis and Eczema in the level of psychological changes was also evaluated. Stress along with some factors measuring the quality of life, were studied. The data generated through three indices was subjected to unbiased statistical analysis to draw conclusion.

- The **Observation and Results** chapter contains conceptual data, demographic data, data related to the clinical assessment of patients through above mentioned three questionnaires, statistical analysis of the data generated through clinical study & intergroup (Psoriasis and Eczema) comparison. It is observed in the literary study that there are several references related to the inter- relation of body and mind and the impact of somatic diseases on mind and viceversa. In observational study it is observed that Psoriasis and Eczema both exert psychological changes in the patient. But the overall quality of life is hampered more in Psoriasis than Eczema.

- Discussion chapter consists of discussion of the siddhant, its literal meanings and interpretation, evidences of body and mind relation in real life and present scenario, association of skin and mind in the body-mind context, overall study plan, discussion regarding the data collection tools, demographic details, clinical observations, limitations and suggestions for future study.

- Conclusion part contains the conclusions of the present study drawn from scientific discussions. Somatic and Psychological diseases influence and aggravate the other disease ie. Somatic or Psychological. Accordingly Psoriasis and Eczema bring about changes in the mind. Quality of Life is impacted more in Psoriasis than Eczema.

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Annexure 1

PSORIASIS AREA AND SEVERITY

INDEX (PASI) PATIENT NAME:

DATE OF VISIT:

PASI is a quantitative rating score for measuring the severity of psoriatic lesions based on area coverage and plaque appearance.

Plaque characteristic	Lesion score	Head	Upper limbs	Trunk	Lower limbs
Erythema	0= None 1=Slight 2=Moderate 3=Severe 4=Verysevere				
Thickness/Induration					
Scaling					
Add together each of the 3 scores for each body region to give separate sums (A)					
Lesion Score Sum(A)					

Percentage area affected	Area score	Head	U.limbs	Trunk	L.limbs
Area score (B) Degree of involvement as a % for each body region affected	0=0% 1=1-9% 2=10-29% 3=30-49% 4=50-69% 5=70-89% 6=90-100%				
Multiply lesion score sum (A) by Area score (B), for each body region, to give 4 individual subtotals(C)					
Subtotals (C)					
Multiply each of the subtotals (C) by amt of body surface area represented by that region, ie 0.1 for head, 0.2 for u. limbs, 0.3 for trunk, 0.4 for lower limbs					
Body Surface Area		**X 0.1**	**X 0.2**	**X 0.3**	**X0.4**
Totals (D)					

PASI SCORE

Annexure 2

ECZEMA AREA AND SEVERITY INDEX (PASI) PATIENT NAME:

DATE OF VISIT:

EASI is a quantitative rating score for measuring the severity of Eczema lesions based on area coverage and symptoms severity.

Symptoms	**Lesion score**	**Head**	**Upper limbs**	**Trunk**	**Lower limbs**
Erythema	0= None 1=Slight 2=Moderate 3=Severe				
Thickness/Induration					
Scratching					
Lichenification					
Add together each of the 4 scores for each body region to give separate sums (A)					
Lesion Score Sum(A)					

Percentage area affected	**Area score**	**Head**	**U.limbs**	**Trunk**	**L.limbs**
Area score (B) Degree of involvement as a % for each body region affected	0=0% 1=1-9% 2=10-29% 3=30-49% 4=50-69% 5=70-89% 6=90-100%				
Multiply lesion score sum (A) by Area score (B), for each body region, to give 4 individual subtotals(C)					
Subtotals (C)					
Multiply each of the subtotals (C) by amt of body surface area represented by that region, ie 0.1 for head, 0.2 for u. limbs, 0.3 for trunk, 0.4 for lower limbs					
Body Surface Area		**X 0.1**	**X 0.2**	**X 0.3**	**X 0.4**
Totals (D)					

EASI SCORE

Annexure 3

SKINDEX-29

HOW OFTEN DURING THE PAST WEEK DO THESE STATEMENTS DESCRIBE YOU?

1. My skin hurts
2. My skin condition affects how well I sleep
3. I worry that my skin condition may be serious
4. My skin condition makes it hard to work or do hobbies
5. My skin condition affects my social life
6. My skin condition makes me feel depressed
7. My skin burns or stings
8. I tend to stay at home because of my skin condition
9. I worry about getting scars from my skin condition
10. My skin itches
11. My skin condition affects how close I can be with my loved ones
12. I am ashamed of my skin condition
13. I worry that my skin condition may getworse
14. I tend to do things by myself because of my skin condition
15. I am angry about my skincondition
16. Water bothers my skin condition
17. My skin condition makes me showing affention difficult
18. I worry about the side effects from skin medications/treatment
19. My skin is irritated
20. My skin condition affects my interaction with others
21. I am embarrassed by my skincondition
22. My skin condition is a problem for the people I love
23. I am frustrated by my skin condition
24. My skin is sensitive
25. My skin condition affects my desire to be with people
26. I am humiliated by my skincondition
27. My skin condition bleeds
28. I am annoyed by my skin condition
29. My skin condition interferes with my sex life
30. My skin condition makes me feel tired

These questions would be graded as follows:

Never – 1

Rarely – 2

Sometimes – 3

Often – 4

All the time –5

Annexure 4

CASE RECORD FORM

CRF No	OPD Reg. No. Date
Name of the patient:	
Sex – M/F	Age:
Educational Status:	Religion:
Residential Address	Occupation:

Chief Complaint and Duration:

1.
2.
3.
4.
5.

History of present illness :

Previous treatment history :

History of past medical /surgical major illness:

Family history *(Kula vrutta)*:

Addiction : Smoking / Drinking alcohol / Tobacco.

ASHTAVIDHAPARIKSHANA

1) ***Nadi***
2) ***Mala***
3) ***Mutra***
4) ***Jivha***
5) ***Shabda***
6) ***Sparsha***
7) ***Drik***
8) ***Akriti***

LAB INVESTIGATIONS:

SR.	INVESTIGATION	
1.	BSL	FASTING PP.
2.	CBC	HB
		RBC
		WBC
3.	ESR	

Signature of Investigator Signature of Supervisor

Date:

ANNEXURE 5

INFORMED CONSENT FORM

I…… give permission to perform necessary examination & laboratory investigations on myself. I have been explained in my own language about the purpose, risks & expected benefits of this research study. I reserve my right to withdraw anytime from this study. I am assured that my name and details won't be disclosed to anyone.

Date: Patient's name

Signature:

अनुमती पत्र

मी माझ्या स्वेच्छेने या परिक्षणासाठी संमती देत आहे. परिक्षण करणाऱ्या वैद्याने मला समजेल अशा भाषेत याचे उद्देश्य व लाभ याविषयी संपूर्ण माहिती दिली आहे. त्यासाठी लागणाऱ्या तपासण्या करून घेण्यास मी तयार आहे. माझ्यावर होणारे परीक्षण थांबवण्याचा हक्क मी अबाधित ठेवत आहे.

दिनांक
रुग्ण नाम

सही

संमती पत्र

मैं ..... स्वेच्छा से इस परीक्षा के लिए सम्मति देता/देती हूँ। परीक्षण से होनेवाले लाभ की जानकारी वैद्य ने मुझे अपने भाषामे दी है। परीक्षण के लिए आवश्यक सभी जांच के लिए मैं तैयार हूँ। परीक्षण स्थगित करने का मेरा अधिकार मैं अबाधित रखता/रखती हूँ।

दिनांक रुग्ण नाम

हस्ताक्षर

Master chart of Skindex-29 and PASI

CRF.no.	OPD reg.	Skindex	PASI total	Symptom score																Percentage area affected					Body surface area				
				Erythema					Thickness/ Induration					Scaling																
				H	UL	T	LL	Total	H	UL	T	LL	Total	H	UL	T	LL	Total	H	UL	T	LL	Total	H	UL	T	LL	Total
1	42855	61	2.8	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2.8	**2.8**
2	47902	82	8.6	1	2	3	2	**8**	0	1	1	0	**2**	3	2	3	2	**10**	1	2	2	1	**6**	0.4	2	4.2	2	**8.6**
3	1060	56	6.3	2	1	0	1	**4**	1	1	1	1	**4**	4	2	3	2	**11**	1	2	2	1	**6**	0.7	1.6	2.4	1.6	**6.3**
4	58636	82	10.5	1	1	1	1	**4**	2	2	2	2	**8**	4	4	4	4	**16**	1	1	4	1	**7**	0.7	0.7	8.4	0.7	**10.5**
5	55833	54	1.8	1	0	0	0	**1**	2	0	0	0	**2**	3	0	0	0	**3**	3	0	0	0	**3**	1.8	0	0	0	**1.8**
6	8823	50	2.5	1	1	2	0	**4**	0	1	1	0	**2**	0	1	1	0	**2**	1	2	1	0	**4**	0.1	1.2	1.2	0	**2.5**
7	74598	54	8.8	2	2	3	1	**8**	2	2	2	1	**7**	0	2	3	1	**6**	1	2	2	1	**6**	0.4	2.4	4.8	1.2	**8.8**
8	73025	45	2.3	1	2	1	0	**4**	1	0	1	0	**2**	2	1	1	0	**4**	2	1	1	0	**4**	0.8	0.6	0.9	0	**2.3**
9	50463	48	2.7	0	0	1	0	**1**	0	0	0	0	**0**	0	0	2	0	**2**	0	0	3	0	**3**	0	0	2.7	0	**2.7**
10	1709	79	15.6	1	2	3	2	**8**	1	3	3	2	**9**	2	2	2	2	**8**	2	2	2	3	**9**	0.8	2.8	4.8	7.2	**15.6**
11	4499	51	11.1	2	3	3	3	**11**	2	2	2	2	**8**	3	2	3	2	**10**	1	2	2	1	**6**	0.7	2.8	4.8	2.8	**11.1**
12	12097	45	6.1	0	1	1	0	**2**	1	1	1	1	**4**	2	2	3	2	**9**	1	2	2	1	**6**	0.3	1.6	3	1.2	**6.1**
13	12616	88	6.9	1	2	2	2	**7**	0	2	2	2	**6**	2	2	1	2	**7**	1	1	2	1	**5**	0.3	1.2	3	2.4	**6.9**

14	7622	134	26.1	3	3	3	2	**11**	2	3	3	2	**10**	3	3	3	3	**12**	2	3	5	2	**12**	1.6	5.4	14	5.6	**26.1**
15	17654	80	3.5	1	0	1	1	**3**	2	0	1	1	**4**	4	0	1	1	**6**	2	0	1	1	**4**	1.4	0	0.9	1.2	**3.5**
16	16893	103	5.5	1	2	1	1	**5**	0	1	0	1	**2**	2	2	2	1	**7**	1	1	2	2	**6**	0.3	1	1.8	2.4	**5.5**
17	14966	86	14.1	0	1	3	1	**5**	0	0	3	3	**6**	0	1	3	3	**7**	0	1	3	2	**6**	0	0.4	8.1	5.6	**14.1**
18	10203	91	4.8	1	1	1	1	**4**	1	2	2	2	**7**	2	2	2	2	**8**	2	1	2	2	**7**	0.8	1	3	4	**8.8**
19	52795	44	1.6	0	1	0	1	**2**	0	1	0	1	**2**	0	0	0	1	**1**	0	1	0	1	**2**	0.1	0.4	0	1.2	**1.7**
20	2256	44	0.7	0	0	0	0	**0**	0	0	0	0	**0**	1	0	2	0	**3**	1	0	1	0	**2**	0.1	0	0.6	0	**0.7**
21	3298	50	2	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2	**2**
22	41660	82	3.8	2	2	1	0	**5**	1	1	0	1	**3**	1	2	0	1	**4**	1	2	2	1	**6**	0.4	2	0.6	0.8	**3.8**
23	52745	88	6	0	1	2	3	**6**	0	0	0	0	**0**	0	2	0	1	**3**	0	1	1	3	**5**	0	0.6	0.6	4.8	**6**
24	52792	94	3.8	0	2	2	1	**5**	0	1	1	1	**3**	0	0	1	0	**1**	0	1	2	1	**4**	0	0.6	2.4	0.8	**3.8**
25	54293	64	7.8	0	0	0	1	**1**	0	2	0	2	**4**	0	3	0	3	**6**	0	3	0	2	**5**	0	3	0	4.8	**7.8**
26	11920	56	2.7	1	0	1	0	**2**	0	0	0	0	**0**	2	3	1	0	**6**	1	2	2	0	**5**	0.3	1.2	1.2	0	**2.7**
27	1028	49	5.7	0	0	0	0	**0**	1	2	2	1	**6**	0	2	2	1	**5**	1	3	2	1	**7**	0.1	2.4	2.4	0.8	**5.7**
28	54034	91	1.2	0	1	0	1	**2**	0	0	0	0	**0**	0	1	0	1	**2**	0	1	0	1	**2**	0	0.4	0	0.8	**1.2**
29	45858	65	7.2	0	1	1	1	**3**	1	2	2	0	**5**	1	2	3	2	**8**	1	1	2	2	**6**	0.2	1	3.6	2.4	**7.2**
30	55156	59	8.3	0	0	0	0	**0**	0	0	2	0	**2**	0	1	3	1	**5**	0	1	5	1	**7**	0	0.2	7.5	0.4	**8.1**

31	38741	70	3.5	0	0	1	0	**1**	0	0	0	0	**0**	0	0	0	2	**2**	0	0	1	4	**5**	0	0	0.3	3.2	**3.5**
32	31978	53	4	0	0	1	1	**2**	0	0	1	1	**2**	1	0	3	2	**6**	1	0	1	2	**4**	0.1	0	1.5	2.4	**4**
33	32005	55	3.6	0	0	1	0	**1**	0	0	0	0	**0**	0	0	2	0	**2**	0	0	4	0	**4**	0	0	3.6	0	**3.6**
34	34794	69	3.7	0	1	2	0	**3**	0	1	2	0	**3**	0	2	3	0	**5**	0	2	1	0	**3**	0	1.6	2.1	0	**3.7**
35	11120	82	4.2	0	3	0	0	**3**	0	2	1	0	**3**	2	2	3	0	**7**	1	2	1	0	**4**	0.2	2.8	1.2	0	**4.2**
36	6195	78	3.6	0	0	2	0	**2**	0	0	0	0	**0**	0	0	2	3	**5**	0	0	2	1	**3**	0	0	2.4	1.2	**3.6**
37	20278	66	3.2	0	1	0	2	**3**	0	0	0	2	**2**	0	1	0	3	**4**	0	1	0	1	**2**	0	0.4	0	2.8	**3.2**
38	42230	84	4.2	0	1	0	1	**2**	0	0	0	1	**1**	0	0	0	3	**3**	0	1	0	2	**3**	0	0.2	0	4	**4.2**
39	17411	78	3.9	0	0	0	0	**0**	0	0	0	2	**2**	3	0	0	1	**4**	1	0	0	3	**4**	0.3	0	0	3.6	**3.9**
40	54542	83	3.4	3	1	0	0	**4**	1	0	0	0	**1**	3	2	0	0	**5**	4	1	0	0	**5**	2.8	0.6	0	0	**3.4**
41	52441	78	4.2	0	3	0	3	**6**	0	1	0	2	**3**	0	3	0	2	**5**	0	1	0	1	**2**	0	1.4	0	2.8	**4.2**
42	30197	74	4.3	0	0	1	0	**1**	0	0	0	2	**2**	0	0	2	2	**4**	0	0	3	1	**4**	0	0	2.7	1.6	**4.3**
43	53616	84	4.2	0	2	0	0	**2**	0	1	0	1	**2**	0	2	0	3	**5**	0	1	0	2	**3**	0	1	0	3.2	**4.2**
44	58251	75	3.9	1	0	0	1	**2**	0	0	0	0	**0**	2	0	0	2	**4**	1	0	0	3	**4**	0.3	0	0	3.6	**3.9**
45	56732	63	3.2	0	0	2	0	**2**	0	0	1	0	**1**	0	1	2	0	**3**	0	1	2	0	**3**	0	0.2	3	0	**3.2**
46	59120	60	3	0	2	0	0	**2**	0	0	1	0	**1**	0	1	3	0	**4**	0	1	2	0	**3**	0	0.6	2.4	0	**3**
47	54293	59	4.2	0	0	2	0	**2**	0	0	2	0	**2**	0	0	3	0	**3**	0	0	2	0	**2**	0	0	4.2	0	**4.2**

48	20831	87	3.6	0	2	0	0	**2**	0	1	0	0	**1**	0	2	0	2	**4**	0	2	0	2	**4**	0	2	0	1.6	**3.6**
49	56268	52	2.7	0	0	0	0	**0**	0	0	1	0	**1**	0	0	2	0	**2**	0	0	3	0	**3**	0	0	2.7	0	**2.7**
50	63076	57	4	0	0	0	0	**0**	0	0	0	1	**1**	0	2	0	2	**4**	0	1	0	3	**4**	0	0.4	0	3.6	**4**
51	63292	80	4	3	1	0	0	**4**	0	1	0	0	**1**	2	3	0	0	**5**	4	2	0	0	**6**	2	2	0	0	**4**
52	63200	76	4.8	0	0	2	0	**2**	0	0	1	0	**1**	0	0	1	3	**4**	0	0	3	1	**4**	0	0	3.6	1.2	**4.8**
53	66655	58	3.2	0	0	0	0	**0**	0	2	0	0	**2**	0	2	0	0	**2**	0	4	0	0	**4**	0	3.2	0	0	**3.2**
54	59227	62	5.4	0	1	0	0	**1**	0	2	2	0	**4**	0	3	3	0	**6**	0	2	2	0	**4**	0	2.4	3	0	**5.4**
55	66984	64	5.8	0	2	0	1	**3**	0	1	2	0	**3**	0	2	3	1	**6**	0	2	2	1	**5**	0	2	3	0.8	**5.8**
56	67827	56	3.2	0	0	0	0	**0**	0	2	0	0	**2**	0	2	0	0	**2**	0	4	0	0	**4**	0	3.2	0	0	**3.2**
57	68443	54	3.8	0	0	0	0	**0**	1	2	0	0	**3**	3	3	0	0	**6**	2	3	0	0	**5**	0.8	3	0	0	**3.8**
58	68458	77	3.8	0	0	2	0	**2**	0	0	0	0	**0**	0	0	3	1	**4**	0	0	2	2	**4**	0	0	3	0.8	**3.8**
59	63327	72	3.6	0	0	1	0	**1**	0	0	2	0	**2**	0	0	3	0	**3**	0	0	2	0	**2**	0	0	3.6	0	**3.6**
60	58088	39	0.6	1	0	0	0	**1**	1	0	0	0	**1**	2	1	0	0	**3**	1	1	0	0	**2**	0.4	0.2	0	0	**0.6**
61	8765	62	2.8	0	0	0	0	**0**	0	1	0	1	**2**	0	1	0	2	**3**	0	1	0	2	**3**	0	0.4	0	2.4	**2.8**
62	68811	54	6	1	2	2	1	**6**	2	1	1	2	**6**	2	0	0	2	**4**	1	1	1	2	**5**	0.5	0.6	0.9	4	**6**
63	4490	48	3.2	0	0	0	0	**0**	0	0	0	1	**1**	0	1	0	2	**3**	0	1	0	1	**2**	0	2	0	1.2	**3.2**
64	737	70	4.4	0	4	0	0	**4**	0	3	0	0	**3**	0	4	0	0	**4**	0	2	0	0	**2**	0	4.4	0	0	**4.4**

65	1444	77	6.8	0	1	1	0	**2**	1	2	2	2	**7**	1	2	2	2	**7**	1	2	2	1	**6**	0.2	2	3	1.6	**6.8**
66	5989	59	2.9	1	0	0	0	**1**	0	0	1	0	**1**	1	0	2	0	**3**	1	0	3	0	**4**	0.2	0	2.7	0	**2.9**
67	5758	69	5	0	2	0	3	**5**	0	1	0	0	**1**	0	2	0	2	**4**	0	1	0	2	**3**	0	1	0	4	**5**
68	8097	56	6.6	0	1	2	1	**4**	1	1	1	1	**4**	2	2	2	2	**8**	1	2	1	2	**6**	0.3	1.6	1.5	3.2	**6.6**
69	8085	48	3.2	0	0	0	0	**0**	0	0	0	1	**1**	0	1	0	2	**3**	0	1	0	1	**2**	0	2	0	1.2	**3.2**
70	18030	59	2.9	1	0	0	0	**1**	0	0	1	0	**1**	1	0	2	0	**3**	1	0	3	0	**4**	0.2	0	2.7	0	**2.9**
71	893	83	8.4	0	1	2	2	**5**	0	1	0	2	**3**	0	1	2	2	**5**	0	1	3	3	**7**	0	0.6	3.6	7.2	**11.4**
72	18031	45	2.6	0	0	0	0	**0**	0	0	0	1	**1**	0	1	0	2	**3**	0	1	0	2	**3**	0	0.2	0	2.4	**2.6**
73	18839	60	6	1	2	2	1	**6**	2	1	1	2	**6**	2	0	0	2	**4**	1	1	1	2	**5**	0.5	0.6	0.9	4	**6**
74	724	136	4.8	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	2	**2**	0	0	0	4.8	**4.8**
75	18029	58	3	0	1	1	1	**3**	0	0	1	1	**2**	1	1	1	2	**5**	1	1	1	1	**4**	0.1	0.4	0.9	1.6	**3**
76	41940	43	3.6	0	0	0	0	**0**	0	0	1	0	**1**	0	0	2	0	**2**	0	0	4	0	**4**	0	0	3.6	0	**3.6**
77	39536	45	1.6	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	1	**1**	0	0	0	1.6	**1.6**
78	8097	76	3.9	1	0	1	0	**2**	0	0	0	0	**0**	2	0	3	0	**5**	1	0	3	0	**4**	0.3	0	3.6	0	**3.9**
79	44910	73	3.6	2	1	0	0	**3**	0	0	0	0	**0**	2	3	0	0	**5**	1	4	0	0	**5**	0.4	3.2	0	0	**3.6**
80	5434	91	6.4	3	0	0	2	**5**	2	0	0	2	**4**	3	0	0	1	**4**	3	0	0	2	**5**	2.4	0	0	4	**6.4**
81	2E+05	87	6.8	0	0	1	0	**1**	1	0	0	2	**3**	2	3	3	3	**11**	2	3	2	1	**8**	0.6	1.8	2.4	2	**6.8**

82	41013	56	3.5	0	0	1	0	**1**	0	0	0	0	**0**	0	0	2	2	**4**	0	0	3	1	**4**	0	0	2.7	0.8	**3.5**
83	31350	79	4	2	1	0	0	**3**	0	0	0	0	**0**	2	3	0	2	**7**	2	3	0	1	**6**	0.8	2.4	0	0.8	**4**
84	3528	80	3.8	2	2	0	0	**4**	1	2	0	0	**3**	3	3	0	0	**6**	4	1	0	0	**5**	2.4	1.4	0	0	**3.8**
85	49443	83	6.3	1	0	2	0	**3**	0	0	1	0	**1**	2	0	3	0	**5**	3	0	3	0	**6**	0.9	0	5.4	0	**6.3**
86	50413	92	11	0	2	2	2	**6**	0	1	1	1	**3**	0	2	2	2	**6**	0	2	2	3	**7**	0	2	3	6	**11**
87	52306	79	6	0	1	0	3	**4**	0	0	0	0	**0**	0	3	0	4	**7**	0	4	0	1	**5**	0	3.2	0	2.8	**6**
88	50025	90	20.8	1	2	2	2	**7**	1	2	3	2	**8**	2	2	3	2	**9**	1	3	4	3	**11**	0.4	3.6	9.6	7.2	**20.8**
89	45770	52	1.8	0	1	0	2	**3**	0	1	0	1	**2**	0	2	0	1	**3**	0	1	0	1	**2**	0	0.6	0	1.2	**1.8**
90	53624	73	6.6	2	0	3	0	**5**	1	0	1	0	**2**	3	0	2	0	**5**	2	0	3	0	**5**	1.2	0	5.4	0	**6.6**
91	20831	73	5.6	1	1	0	0	**2**	0	0	1	0	**1**	3	2	3	0	**8**	2	2	3	0	**7**	0.8	1.2	3.6	0	**5.6**
92	53887	65	8.6	0	0	0	0	**0**	0	2	0	1	**3**	0	3	0	2	**5**	0	1	0	2	**3**	0	6.2	0	2.4	**8.6**
93	11126	59	3.5	0	0	0	0	**0**	1	1	2	0	**4**	2	1	2	0	**5**	1	2	2	0	**5**	0.3	0.8	2.4	0	**3.5**
94	52293	75	8	1	2	2	0	**5**	0	1	2	2	**5**	1	2	3	2	**8**	1	2	2	1	**6**	0.2	2	4.2	1.6	**8**
95	49512	65	7	1	2	0	2	**5**	0	1	0	2	**3**	1	2	0	2	**5**	1	2	0	2	**5**	0.2	2	0	4.8	**7**
96	55628	65	7	0	0	1	0	**1**	0	1	1	2	**4**	0	2	2	3	**7**	0	1	2	2	**5**	0	0.6	2.4	4	**7**
97	55563	55	4.3	0	0	2	0	**2**	0	0	2	0	**2**	1	0	7	0	**8**	1	0	2	0	**3**	0.1	0	4.2	0	**4.3**
98	16379	53	3.6	0	1	0	1	**2**	0	2	0	2	**4**	0	2	0	2	**4**	0	2	0	1	**3**	0	2	0	1.6	**3.6**

99	298	81	4	0	2	1	0	**3**	0	2	1	0	**3**	0	3	2	0	**5**	0	2	1	0	**3**	0	2.8	1.2	0	**4**
100	1256	76	4.2	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	1	3	**4**	0	0	0.6	3.6	**4.2**
101	1285	97	6.3	2	2	0	0	**4**	0	1	0	1	**2**	1	3	0	2	**6**	1	4	0	1	**6**	0.3	4.8	0	1.2	**6.3**
102	1261	71	4.9	0	2	1	0	**3**	0	0	1	0	**1**	0	3	3	1	**7**	0	3	1	1	**5**	0	3	1.5	0.4	**4.9**
103	9014	73	4.2	0	0	0	0	**0**	0	0	0	0	**0**	0	3	0	3	**6**	0	1	0	3	**4**	0	0.6	0	3.6	**4.2**
104	9064	76	4.4	0	2	0	2	**4**	0	0	0	0	**0**	0	2	0	1	**3**	0	1	0	3	**4**	0	0.8	0	3.6	**4.4**
105	15189	48	4.9	0	0	1	1	**2**	0	0	2	1	**3**	1	0	1	1	**3**	1	0	2	2	**5**	0.1	0	2.4	2.4	**4.9**
106	15015	74	3.6	0	2	0	0	**2**	0	2	0	0	**2**	0	3	0	2	**5**	0	2	0	1	**3**	0	2.8	0	0.8	**3.6**
107	17888	75	3.6	0	0	2	0	**2**	0	0	0	0	**0**	0	0	2	0	**2**	0	0	3	0	**3**	0	0	3.6	0	**3.6**
108	19135	58	2.9	0	0	0	0	**0**	0	0	0	0	**0**	2	0	3	0	**5**	1	0	3	0	**4**	0.2	0	2.7	0	**2.9**
109	19071	59	4.4	0	0	3	0	**3**	0	0	1	0	**1**	2	0	3	0	**5**	1	0	2	0	**3**	0.2	0	4.2	0	**4.4**
110	20029	81	4.2	0	0	0	3	**3**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	2	**3**	0	0.2	0	4	**4.2**
111	20078	57	4	0	0	0	2	**2**	0	0	0	0	**0**	0	0	0	3	**3**	0	0	0	2	**2**	0	0	0	4	**4**
112	19934	57	4.3	0	0	2	0	**2**	0	0	2	0	**2**	1	0	3	0	**4**	1	0	2	0	**3**	0.1	0	4.2	0	**4.3**
113	24439	168	7.2	0	2	0	0	**2**	0	2	2	0	**4**	0	2	2	0	**4**	0	4	2	0	**6**	0	4.8	2.4	0	**7.2**
	MEAN	**69.59**	**5.10**					**2.72**					**2.42**					**4.92**					**4.36**					**5.16**
	SD	**19.37**	**3.49**					**2.30**					**2.20**					**2.47**					**1.88**					**3.54**

	MIN	**39.00**	**0.60**					**0.00**					**0.00**					**1.00**					**1.00**					**0.60**
	MEDIAN	**69.00**	**4.20**					**2.00**					**2.00**					**5.00**					**4.00**					**4.20**
	MAX	**168.00**	**26.10**					**11.00**					**10.00**					**16.00**					**12.00**					**26.10**

Master chart of Skindex-29 and EASI

Sr. No.	OPD reg.	Skindex	EASI total	Symptom score																						Percentage area affected					Body surface area				
				Erythema					Thickness/Induration					Scratching					Lichenification																	
				H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL	H	UL	T	LL	TOTAL
1	3459	81	6.8	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	2	**3**	0	0	0	1	**1**	0	2	0	3	**5**	0	0.8	0	6	6.8
2	72940	68	5	0	0	0	0	**0**	0	2	0	2	**4**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	4	5
3	1432	124	8.4	0	1	0	0	**1**	0	2	0	2	**4**	0	3	0	3	**6**	0	0	0	0	**0**	0	2	0	3	**5**	0	2.4	0	6	8.4
4	15362	81	6.4	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	6.4	6.4
5	18785	73	5.9	0	0	0	0	**0**	0	1	0	1	**2**	0	3	1	2	**6**	0	1	0	0	**1**	0	2	1	3	**6**	0	2	0.3	3.6	5.9
6	20320	71	4.8	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	4.8	4.8
7	20321	67	2.8	0	0	0	0	**0**	0	1	0	2	**3**	0	2	0	2	**4**	0	1	0	1	**2**	0	1	0	1	**2**	0	0.8	0	2	2.8
8	21984	67	4.8	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	4.8	4.8
9	21868	80	2.3	0	1	0	1	**2**	0	1	0	1	**2**	3	2	0	2	**7**	0	1	0	1	**2**	1	1	0	1	**3**	0.3	1	0	2	3.3
10	15489	49	3.2	0	1	0	1	**2**	0	0	0	1	**1**	0	2	0	3	**5**	0	1	0	1	**2**	0	1	0	1	**2**	0	0.8	0	2.4	3.2
11	27193	89	7.2	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	7.2	7.2
12	31151	59	3.9	0	0	0	1	**1**	0	2	0	2	**4**	0	3	0	3	**6**	0	0	0	2	**2**	0	1	0	1	**2**	0	1	0	2.8	3.8
13	37774	58	3.5	0	0	0	0	**0**	0	0	0	2	**2**	0	0	1	2	**3**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.3	3.2	3.5
14	46415	68	5	0	0	0	0	**0**	0	1	0	1	**2**	0	3	2	2	**7**	0	1	0	0	**1**	0	2	1	2	**5**	0	2	0.6	2.4	5
15	49308	63	4.8	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	4.8	4.8
16	52793	80	5.8	0	0	1	1	**2**	0	0	2	1	**3**	0	0	2	2	**4**	0	0	1	1	**2**	0	0	1	2	**3**	0	0	1.8	4	5.8
17	731	44	1.6	0	0	0	0	**0**	0	0	0	1	**1**	1	0	0	2	**3**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	1.	1.6

	49																																6	
18	75209	56	2.7	0	0	0	0	**0**	0	1	1	1	**3**	0	2	2	2	**6**	0	0	0	0	**0**	0	1	1	1	**3**	0	0.6	0.9	1.2	2.7
19	20916	41	4	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	4	4
20	398	54	3.5	1	0	0	1	**2**	0	0	0	1	**1**	2	0	0	2	**4**	0	0	0	0	**0**	1	0	0	2	**3**	0.3	0	0	3.2	3.5
21	570	50	3	0	0	1	0	**1**	0	1	2	0	**3**	0	2	3	0	**5**	0	0	0	0	**0**	0	2	1	0	**3**	0	1.2	1.8	0	3
22	736	64	4.2	0	0	0	0	**0**	0	0	0	2	**2**	2	0	0	3	**5**	0	0	0	0	**0**	1	0	0	2	**3**	0.2	0	0	4	4.2
23	580	64	4	0	1	0	0	**1**	0	2	0	2	**4**	0	3	0	2	**5**	0	0	0	0	**0**	0	2	0	1	**3**	0	2.4	0	1.6	4
24	1132	55	5.2	0	0	0	1	**1**	0	0	0	1	**1**	0	3	0	3	**6**	0	0	0	0	**0**	0	2	0	2	**4**	0	1.2	0	4	5.2
25	869	51	3.5	0	0	0	0	**0**	0	0	0	1	**1**	0	0	1	2	**3**	0	0	0	1	**1**	0	0	1	2	**3**	0	0	0.3	3.2	3.5
26	3359	62	4.8	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	3	**3**	0	0	0	4.8	4.8
27	4716	43	2.4	0	1	0	0	**1**	0	2	0	0	**2**	0	3	0	0	**3**	0	0	0	0	**0**	0	2	0	0	**2**	0	2.4	0	0	2.4
28	4575	58	3.8	0	0	0	1	**1**	0	0	0	0	**0**	0	0	2	3	**5**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.6	3.2	3.8
29	5423	59	3.6	0	1	0	0	**1**	0	0	0	0	**0**	0	2	0	3	**5**	0	0	0	0	**0**	0	2	0	2	**4**	0	1.2	0	2.4	3.6
30	577	55	3.2	0	1	0	0	**1**	0	3	0	0	**3**	0	3	0	0	**3**	0	1	0	0	**1**	0	2	0	0	**2**	0	3.2	0	0	3.2
31	5564	50	3.2	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	3.2	3.2
32	1094	51	3.2	0	0	0	1	**1**	0	0	1	1	**2**	0	0	3	3	**6**	0	0	0	0	**0**	0	0	1	1	**2**	0	0	1.2	2	3.2
33	5891	46	2.6	0	0	0	0	**0**	0	0	0	1	**1**	0	1	0	2	**3**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.2	0	2.4	2.6
34	7464	62	4.2	0	0	0	0	**0**	0	2	0	2	**4**	0	3	0	2	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	3.2	4.2
35	781	39	1.8	0	0	0	1	**1**	0	0	0	1	**1**	0	1	0	2	**3**	0	0	0	0	**0**	0	1	0	1	**2**	0	0.2	0	1.6	1.8
36	888	47	2.8	0	0	0	0	**0**	0	0	0	0	**0**	0	2	0	3	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.4	0	2.4	2.8
37	3406	61	4.4	0	0	0	0	**0**	0	0	0	0	**0**	0	3	0	3	**6**	0	0	0	1	**1**	0	2	0	2	**4**	0	1.2	0	3.2	4.4
38	9956	44	2.3	0	0	0	0	**0**	0	0	0	1	**1**	0	0	1	3	**4**	0	0	0	1	**1**	0	0	1	1	**2**	0	0	0.3	2	2.3

39	8668	56	3.2	1	0	0	1	**2**	1	0	0	2	**3**	2	0	0	3	**5**	0	0	0	1	**1**	1	0	0	1	**2**	0.4	0	0	2.8	3.2
40	2830	43	2.4	0	1	0	0	**1**	0	2	0	0	**2**	0	3	0	0	**3**	0	0	0	0	**0**	0	2	0	0	**2**	0	2.4	0	0	2.4
41	7435	55	3.5	0	0	0	0	**0**	0	0	0	2	**2**	0	0	1	2	**3**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.3	3.2	3.5
42	1116	55	2.8	0	0	0	0	**0**	0	0	0	2	**2**	0	2	0	3	**5**	0	0	0	0	**0**	0	2	0	1	**3**	0	0.8	0	2	2.8
43	9617	46	2.7	0	0	0	0	**0**	0	0	0	0	**0**	0	0	1	3	**4**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.3	2.4	2.7
44	10323	55	3.6	0	0	0	0	**0**	0	0	0	1	**1**	0	2	0	3	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.4	0	3.2	3.6
45	10371	46	2.4	1	0	0	0	**1**	0	0	0	2	**2**	3	0	0	3	**6**	0	0	0	0	**0**	1	0	0	1	**2**	0.4	0	0	2	2.4
46	11127	38	1.6	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	1.6	1.6
47	7423	53	3.2	0	0	0	0	**0**	0	0	0	0	**0**	2	3	0	3	**8**	0	0	0	0	**0**	1	1	0	2	**4**	0.2	0.6	0	2.4	3.2
48	15089	69	4	0	0	0	0	**0**	0	1	0	0	**1**	0	3	2	3	**8**	0	1	0	0	**1**	0	1	1	2	**4**	0	1	0.6	2.4	4
49	18025	58	1.2	0	0	0	0	**0**	0	0	1	0	**1**	0	0	2	0	**2**	0	0	1	0	**1**	0	0	1	0	**1**	0	0	1.2	0	1.2
50	17818	66	5.2	0	0	0	1	**1**	0	0	0	1	**1**	1	2	1	3	**7**	0	0	0	1	**1**	0	1	0	2	**3**	0	0.4	0	4.8	5.2
51	18027	47	3.2	0	0	0	0	**0**	0	1	0	1	**2**	0	1	0	2	**3**	0	0	0	0	**0**	0	2	0	2	**4**	0	0.8	0	2.4	3.2
52	36888	45	2.2	0	1	0	0	**1**	0	1	0	0	**1**	2	3	0	0	**5**	0	0	0	0	**0**	1	2	0	0	**3**	0.2	2	0	0	2.2
53	43594	62	4.2	0	0	0	0	**0**	0	2	0	1	**3**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	3.2	4.2
54	45957	67	4.9	0	0	0	0	**0**	0	1	0	2	**3**	1	2	0	1	**4**	0	0	0	0	**0**	1	2	0	3	**6**	0.1	1.2	0	3.6	4.9
55	40210	59	4	0	1	0	0	**1**	0	1	0	1	**2**	0	2	0	3	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.8	0	3.2	4
56	26102	42	2.2	0	0	0	1	**1**	0	1	0	1	**2**	0	0	0	3	**3**	0	0	0	0	**0**	0	1	0	1	**2**	0	0.2	0	2	2.2
57	48449	53	3.1	0	0	0	0	**0**	0	0	0	2	**2**	0	0	1	3	**4**	0	0	0	2	**2**	0	0	1	1	**2**	0	0	0.3	2.8	3.1
58	48762	46	2.4	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	2.4	2.4
59	48770	50	3.2	0	0	0	1	**1**	0	0	0	1	**1**	0	2	0	3	**5**	0	0	0	2	**2**	0	1	0	1	**2**	0	0.4	0	2.8	3.2
60	48848	47	2.8	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	2.8	2.8

61	44636	57	3.8	0	0	0	0	**0**	0	0	0	0	**0**	0	1	0	3	**4**	0	0	0	0	**0**	0	1	0	3	**4**	0	0.2	0	3.6	3.8
62	49637	46	2.8	0	0	0	0	**0**	0	0	0	1	**1**	0	2	0	2	**4**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.4	0	2.4	2.8
63	49749	62	4.2	0	0	0	0	**0**	0	2	0	0	**2**	0	3	3	0	**6**	0	1	0	0	**1**	0	2	2	0	**4**	0	2.4	1.8	0	4.2
64	51691	36	0.6	0	0	0	0	**0**	0	1	0	0	**1**	0	2	0	0	**2**	0	0	0	0	**0**	0	1	0	0	**1**	0	0.6	0	0	0.6
65	51868	57	3.8	0	0	0	0	**0**	0	0	0	1	**1**	0	1	0	2	**3**	0	0	0	0	**0**	0	2	0	3	**5**	0	0.2	0	3.6	3.8
66	52533	59	3.9	0	0	0	0	**0**	0	0	0	1	**1**	1	0	2	3	**6**	0	0	0	0	**0**	1	0	1	2	**4**	0.1	0	0.6	3.2	3.9
67	45338	61	4.3	0	0	0	0	**0**	1	3	0	0	**4**	2	3	0	0	**5**	0	2	0	0	**2**	1	2	0	1	**4**	0.3	3.2	0	0.8	4.3
68	45444	76	7.7	0	0	0	0	**0**	0	2	0	2	**4**	0	3	3	3	**9**	0	0	0	1	**1**	0	2	1	2	**5**	0	2	0.9	4.8	7.7
69	50013	41	2.2	0	0	0	0	**0**	0	0	0	2	**2**	2	0	0	3	**5**	0	0	0	0	**0**	1	0	0	1	**2**	0.2	0	0	2	2.2
70	52697	66	4.8	0	0	0	0	**0**	0	1	0	0	**1**	0	2	2	3	**7**	0	0	0	0	**0**	0	3	1	2	**6**	0	1.8	0.6	2.4	4.8
71	53619	69	5.2	0	0	0	1	**1**	0	2	0	0	**2**	0	3	0	3	**6**	0	0	0	0	**0**	0	2	0	2	**4**	0	2	0	3.2	5.2
72	53795	63	4.3	0	0	0	0	**0**	0	0	0	2	**2**	0	0	1	3	**4**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.3	4	4.3
73	54060	47	2.8	0	0	0	0	**0**	0	1	0	2	**3**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	1	**2**	0	0.8	0	2	2.8
74	54100	53	3.2	0	0	0	0	**0**	0	2	0	1	**3**	0	3	2	3	**8**	0	0	0	0	**0**	0	1	1	1	**3**	0	1	0.6	1.6	3.2
75	54045	62	4.1	0	0	0	0	**0**	0	1	0	1	**2**	1	3	0	3	**7**	0	0	0	0	**0**	1	1	0	2	**4**	0.1	0.8	0	3.2	4.1
76	54207	47	2.8	0	0	0	0	**0**	0	0	0	3	**3**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	2.8	2.8
77	54460	68	3.2	1	1	0	0	**2**	0	2	0	0	**2**	3	3	0	0	**6**	0	0	0	0	**0**	2	2	0	0	**4**	0.8	2.4	0	0	3.2
78	55698	51	3.2	0	0	0	0	**0**	0	1	0	0	**1**	0	3	0	2	**5**	0	0	0	0	**0**	0	3	0	1	**4**	0	2.4	0	0.8	3.2
79	55715	57	4	0	0	0	0	**0**	0	1	0	2	**3**	0	3	0	2	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.8	0	3.2	4
80	58672	42	2	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	2	2
81	57159	55	3.2	0	0	0	0	**0**	0	2	0	0	**2**	0	2	0	3	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.8	0	2.4	3.2
82	58749	79	4.6	0	0	0	1	**1**	0	0	0	2	**2**	0	3	0	2	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.6	0	4	4.6

83	60332	50	2.8	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	2.8	2.8
84	52016	57	3.8	0	0	0	0	**0**	0	0	1	0	**1**	0	1	3	0	**4**	0	0	0	0	**0**	0	1	3	0	**4**	0	0.2	3.6	0	3.8
85	64187	53	3.2	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	3.2	3.2
86	293	41	4	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	4	4
87	2198	50	3.8	0	0	0	0	**0**	0	1	0	1	**2**	0	3	0	3	**6**	0	0	0	0	**0**	0	2	0	2	**4**	0	1.6	0	3.2	4.8
88	53	59	4	0	0	0	0	**0**	0	0	0	1	**1**	0	2	0	2	**4**	0	0	0	0	**0**	0	1	0	3	**4**	0	0.4	0	3.6	4
89	11423	63	4.3	0	0	1	0	**1**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.3	4	4.3
90	9759	53	3.2	0	1	0	1	**2**	0	1	0	0	**1**	0	2	0	3	**5**	0	0	0	0	**0**	0	2	0	1	**3**	0	1.6	0	1.6	3.2
91	11498	68	4.6	0	0	0	0	**0**	0	0	0	2	**2**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.6	0	4	4.6
92	9063	55	3.1	0	0	0	1	**1**	0	0	0	1	**1**	0	0	1	1	**2**	0	0	0	0	**0**	2	0	1	2	**5**	0.4	0	0.3	2.4	3.1
93	14399	55	3.7	0	0	1	2	**3**	0	0	0	1	**1**	0	0	2	3	**5**	0	0	0	1	**1**	0	0	1	1	**2**	0	0	0.9	2.8	3.7
94	17572	47	3	2	0	0	0	**2**	0	0	0	0	**0**	0	2	0	3	**5**	0	0	0	0	**0**	1	1	0	0	**2**	0.2	0.4	0	2.4	3
95	17556	47	3.4	0	0	0	1	**1**	0	0	0	2	**2**	0	3	0	3	**6**	0	0	0	1	**1**	0	1	0	1	**2**	0	0.6	0	2.8	3.4
96	19088	48	2.8	0	0	0	0	**0**	0	0	0	0	**0**	0	2	0	3	**5**	0	0	0	0	**0**	0	1	0	2	**3**	0	0.4	0	2.4	2.8
97	4683	46	2.6	0	0	0	1	**1**	0	0	0	2	**2**	0	0	2	2	**4**	0	0	0	0	**0**	0	0	1	1	**2**	0	0	0.6	2	2.6
98	21733	55	3.4	1	0	0	0	**1**	0	0	0	1	**1**	3	0	2	2	**7**	0	0	0	0	**0**	1	0	1	2	**4**	0.4	0	0.6	2.4	3.4
99	28262	42	5.8	0	1	0	1	**2**	0	1	0	2	**3**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	4.8	5.8
100	12185	42	1.6	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	1.6	1.6
101	30894	66	4.6	0	0	0	0	**0**	0	0	0	2	**2**	0	0	2	3	**5**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	0.6	4	4.6
102	12146	52	3.3	0	0	0	0	**0**	0	0	0	0	**0**	1	0	0	2	**3**	0	0	0	0	**0**	1	0	0	4	**5**	0.1	0	0	3.2	3.3
103	37317	62	4.2	0	1	0	0	**1**	0	1	0	1	**2**	0	3	0	3	**6**	0	0	0	0	**0**	0	1	0	2	**3**	0	1	0	3.2	4.2
104	17886	50	5.6	0	0	0	0	**0**	0	0	0	2	**2**	0	0	0	3	**3**	0	0	0	2	**2**	0	0	0	2	**2**	0	0	0	5.6	5.6

105	2546	36	1.6	0	0	0	0	**0**	0	0	0	1	**1**	0	0	0	2	**2**	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	1.6	1.6
106	9077	39	7.6	0	0	0	0	**0**	0	0	0	2	**2**	0	2	0	3	**5**	0	0	0	1	**1**	0	1	0	3	**4**	0	0.4	0	7.2	7.6
107	13425	58	2.6	0	0	0	0	**0**	0	2	0	1	**3**	0	2	0	1	**3**	0	1	0	0	**1**	0	1	0	2	**3**	0	1	0	1.6	2.6
108	21983	52	2.4	0	0	0	0	**0**	0	1	0	1	**2**	0	2	0	2	**4**	0	0	0	0	**0**	0	2	0	1	**3**	0	1.2	0	1.2	2.4
109	6543	54	3	0	1	0	1	**2**	0	2	0	1	**3**	0	3	0	2	**5**	0	1	0	0	**1**	0	1	0	1	**2**	0	1.4	0	1.6	3
110	986	36	1.8	0	0	0	0	**0**	0	0	0	1	**1**	0	3	0	2	**5**	0	0	0	0	**0**	0	1	0	1	**2**	0	0.6	0	1.2	1.8
111	29446	96	7.8	0	0	0	0	**0**	0	2	0	2	**4**	0	2	2	3	**7**	0	0	0	2	**2**	0	2	1	2	**5**	0	1.6	0.6	5.6	7.8
112	29429	70	5.2	0	0	1	0	**1**	0	0	0	0	**0**	0	0	3	3	**6**	0	0	0	0	**0**	0	0	1	2	**3**	0	0	1.2	4	5.2
113	68362	64	6	0	0	0	1	**1**	0	0	0	1	**1**	0	0	0	3	**3**	0	0	0	0	**0**	0	0	0	3	**3**	0	0	0	6	6
MEAN		**56.74**	**3.74**					**0.52**					**1.75**					**4.55**					**0.47**					**2.91**					**3.75**
SD		**13.20**	**1.43**					**0.71**					**1.05**					**1.56**					**0.68**					**1.17**					**1.43**
MIN		**36**	**0.6**					**0**					**0**					**2**					**0**					**1**					**0.6**
MEDIAN		**55**	**3.5**					**0**					**2**					**5**					**0**					**3**					**3.5**
MAX		**124**	**8.4**					**3**					**4**					**9**					**2**					**6**					**8.4**