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Psychological Morbidity and Quality of Life in *Shwitra* (Vitiligo) Patients

Research Article

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Abstract

Background: Skin colour plays an important role in an individual's perception of health, desirability, worth and wealth. Vitiligo presents as milky – white patches in the skin which can result in psychological morbidity, social stigmatization and hampered quality of life. According to modern dermatology, *Shwitra* can be correlated with Vitiligo. Aim: To study Effect of *Shwitra* (Vitiligo) On Quality Of Life and Depression. Methods: Trial group includes previously diagnosed 200 patients of *Shwitra*. For the assessment of dermatology life quality index DLQI questionnaire was used, level of depression was assessed with Hamilton Depression Rating Scale (HAM-D) and to estimate the baseline percentage of Vitiligo involvement in each body region Vitiligo Area Scoring Index (VASI) scale was used. Results: patients had a range of concerns regarding their disease such as physical appearance, progression of white patches on to exposed skin and the whole body, social restriction, dietary restrictions, difficulty in getting jobs and major concern about difficulty to getting married. Mild to moderate Depression was common. Multiple medical consultations at various system of medicine were frequent. Complete repigmentation was strongly desired. The diseased imposed a significant financial burden. The problems were more severe in females. Conclusion: an empathetic and supportive doctor – patient interaction, information regarding Vitiligo, early diagnosis, prompt treatment, good social especially family support and psychotherapeutic interventions can help the patient to live with their disease, and to manage the associated psychosocial and psychiatric comorbidity.

Key Words: Depression, Psychological Stress, Quality of Life, Vitiligo, Shwitra.

Introduction

Desire to become beautiful is very much related to become white. Though white colour reflects cleanliness, peace and calmness, as per rule of nature ' always avoid excessiveness', excess in whiteness disturb physical as well as psychological homeostasis of a human being. *Shwitra* or Vitiligo doesn't possess much internal pathology / morbidity, but it causes cosmetic disfigurement leading to psychological trauma to the patients.

Skin is a mirror that reflects external and internal pathology. It is the first organ of the body interacting with environmental stimuli and natural ability of body, to deal with these factors results in spontaneous remissions and relapses. Interaction with these factors results in specific reaction pattern producing characteristic skin lesions in different body parts. Large community prevalence studies have demonstrated that about 20 – 30 % of the world population have various skin problems requiring attention (1). Skin diseases affect all ages from neonates to the elderly and cause harm in number of ways, such as discomfort, disfigurement, disability etc.

Shwitra (Vitiligo) – a soul harrowing disease is one among various skin diseases. It is very distressing disease both for the patients as well as physician. It is major problem for patient especially female unmarried, because of its ugly appearance and presentation of the body, which may disturbs his personal, familial and social life. For physician *Shwitra* is troublesome because there is lack of particular remedy for radical cure and its poor prognosis.

All the skin diseases in *Ayurveda* have been described under heading of *Kushtha*. *Kushtha* is divided into *Maha Kushtha* and *Kshudra Kushtha*. However *Shwitra* has not been counted among various types of *Kushtha* in *brihattrayi*. *Shwitra* is mentioned along with other types of *Kushtha*, but the difference between *Shwitra* and *Kushtha* is based on non – secretary and non-infectious nature of disease, involvement of *twak* only, peculiarity of *nidana*, *asadhya lakshana* and chronicity. According to modern dermatology, *Shwitra* can be correlated with Vitiligo and leucoderma.

Vitiligo is just not a disease of today's era, but has caused a lot of suffering to human being since a long time. Normal skin color is dependent on hemoglobin (in both the oxygenated and reduced state), carotenoids and melanin pigment (2). Vitiligo is a common disorder of unknown etiology even today (3). Worldwide prevalence of Vitiligo is observed as 1 % of the population (4). Based on dermatological out patient

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record, it is estimated between 0.25 - 2.5 % in India (5), although an incidence as high as 8.8% in Gujarat and Rajasthan states has also been reported (6).

Vitiligo may be become; a psychologically devastating disorder when it typically occurs in exposed areas (face and hands) has a major impact on self – esteem and perception of the self. In some societies, women with Vitiligo have difficulty in getting married and finding educational and vocational opportunities according to their skills. Vitiligo on the face is ranked 17th by WHO in worlds most disabling diseases.

The present study focus light on the assessment of quality of life and level of depression in patients of *Shwitra* (Vitiligo).

Materials and Methods

Method of collection of data

Trial group: previously diagnosed 200 patients of *Shwitra* (Vitiligo) from Vadodara district were selected. For the assessment of dermatology life quality index DLQI questionnaire was used, level of depression was assessed with Hamilton Depression Rating Scale (HAM-D) and to estimate the baseline percentage of Vitiligo involvement in each body region Vitiligo Area Scoring Index (VASI) scale was used.

Sampling Technique: Convenient Sampling Technique
Study Design: Cross Sectional, Observational, Descriptive, Case Control Study.

Inclusion Criteria

- Clinically diagnosed *Shwitra* (Vitiligo) patients in the age group of 20 to 59 from Vadodara district irrespective of gender, caste, religion and socio-economic status willing to take part in the study were included.

Exclusion criteria

- Patients of leukoderma was excluded (leukoderma will strictly occur following a physical trauma such as cut, burn / ulceration.
- Patients with personal and familial mental illness, any other major systemic disorder (Systemic Lupus Erythematosus, Diabetes Mellitus, Acquired Immuno Deficiency Syndrome) and congenital brain or spinal cord anomalies
- Patients with other obvious causes of depression.

Plan of the study

This study was conducted in the Parul Ayurveda hospital, Vadodara, Gujarat. The study was carried out after obtaining permission from institutional ethics committee. Inform consent (IC) of the patients was taken prior to clinical study. After ethical clearance of the synopsis, study was registered in CTRI.

Detailed demographic variables, age of onset, duration and course of the disease, family and treatment history were recorded. Clinical examination in respect to type of *Shwitra*, site of involvement, extent, and percentage of involvement was done. Vitiligo area scoring index (VASI) score was used for the gradation of *Shwitra.*

English language versions of the DLQI and HAM-D-17 questionnaire were translated into Guajarati language by two bilinguals. Forward translation and backward translation was done by different translator (two bilinguals each) and validated by three members.

Quality Of Life assessment was done using Dermatology Life Quality Index. HAM-D 17 questionnaire is used to find out the level of depression in Vitiligo patients.

Assessment Criteria

A. *Shwitra* (Vitiligo)
- Gradation: VASI Score
- Area of *Shwitra*: Exposed Part / Unexposed Part / Both

B. Assessment of depression: Hamilton Depression Scale

C. Assessment of quality of life in *Shwitra* (Vitiligo) patients: Dermatology Life Quality Index (DLQI)

Subjective Parameters

Hamilton Depression Scale (HAM-D) & Dermatology Life Quality Index (DLQI)

DLQI: Quality Of Life assessment was done using Dermatology Life Quality Index introduced by Prof A Y Finlay. It is a valid questionnaire including 10 items on patient's symptoms, feelings, routine activities, kind of clothes, social or leisure activities, physical exercise, educational activities, sexual activities, interpersonal relationships, and treatment options with 0-30 point's score (7, 8, 9). Responses on the DLQI were recorded.

HAM-D: HAM-D 17 questionnaire is used to find out the level of depression in Vitiligo patients. The Hamilton Depression Rating Scale (HAM-D) has proven useful for many years as a way of determining a patient's level of depression before, during, and after treatment. Although the HAM-D form lists 21 items, the scoring is based on the first 17. Eight items are scored on a 5-point scale, ranging from 0 = not present to 4 = severe. Nine are scored from 0-2.

VASI: Hamzavi et al. (10) have introduced a quantitative parametric score, named VASI for Vitiligo Area Scoring Index, which is conceptually derived from the PASI score widely used in psoriasis assessment (11). The total body VASI is calculated using a formula that includes contributions from all body regions (possible range, 0–100) One hand unit, which encompasses the palm plus the volar surface of all the digits, is approximately 1% of the total body surface area (12) and is used as a guide to estimate the baseline percentage of Vitiligo involvement in each body region. The body is divided into five separate and mutually exclusive regions: hands, upper extremities (excluding hands), trunk, lower extremities (excluding feet), and feet. The axillary region is included with the upper extremities while the buttocks and inguinal areas are included with the lower extremities. The extent of residual depigmentation is expressed by the following percentages: 0, 10%, 25%, 50%, 75%, 90%, or 100%.

Objective Parameters

Symptoms	Gradation (VASI Score)
Whitish discoloration	1: 10 %, only specks of depigmentation are present 2: 25 %, the pigmented area exceeds the depigmented area 3: 50 %, depigmented and pigmented areas are equal 4: 75 %, the depigmented area exceeds the pigmented area 5: 90 %, specks of pigment are present 6: 100 %, depigmentation, no pigment is present
Area of *Shwitra*	Exposed / Unexposed / Both

Type of *Shwitra*

Type	Symptoms	Gradation	Description
Vataj	Blackish	----	----
	May Disappear	----	----
	Dry	1	No line on scrubbing with nail
		2	Faint line on scrubbing with nail
		3	Lining and even words can be written by nail
		4	Excessive dryness leading to itching
		5	Dryness leading to crack formation
Pittaj	Reddish like lotus	----	----
	Burning	1	No burning
		2	Occasional localized burning sensation
		3	Localized mild burning sensation in a particular hours of day
		4	Burning throughout the day – tolerable and relieved after cold medications
		5	Intolerable burning sensation throughout the day which can't be relieved by cold medications
Kaphaj	Whitish	----	----
	Thick	1	No thickness
		2	Mild thickening
		3	Moderate thickening
		4	Very thick thickening
		5	Very thick with indurations
	Itching	1	No itching
		2	Mild / occasional itching
		3	Moderate / frequent itching
		4	Severe frequent itching
		5	Very severe itching which disturb sleep and routine activities
	Oily	1	No oiliness
		2	Occasional oiliness
		3	Oiliness in a particular hours of day (after getting up from sleep)
		4	Oiliness throughout the day – tolerable
		5	Intolerable oiliness throughout the day

Statistical Analysis: Statistical analysis on trial group was done using Chi-square test of independence of attributes. We have used Crammer's V statistical tool to find the degree of association. Statistical analysis was done using Statistical Package for Social Science (SPSS) software.

Results

In this study maximum patients 78 (39 %) were belonging to third decade of the life**,** Maximum patients were female 120 (60 %), 154 (77 %) were married, 107 (53.5%) were belonging to Urban habitat, 186 (93 %) were belonging to Hindu religion, 144 (72) were graduated, 84 (42 %) were home maker, 55 (27.5 %) were doing office work, 150 (75 %) belongs to medium socio economic status, 160 (80 %) consume vegetarian diet, 137 (68.5%) had habit of sipping tea, 178 (89 %) were having Regular, Satisfactory Bowel Habit, 52 (26 %) were experiencing disturbed sleep.

10 (5 %) were having *avara satva*, 170 (85 %) were having *madhyam satva* and 20 (10 %) were having *pravara satva*, 152 (76 %) were having *Madhyam* (Moderate) *Aahar Shakti* and 48 (24 %) were having *Avara* (Poor) *Aahar Shakti*, 169 (84.5 %) were having *Madhyam* (Moderate) *Vyayam Shakti*, 29 (14.5 %) were having *Avara* (Poor) *Vyayam Shakti* and only 2 (1 %) were having *pravara* (good) *vyayam Shakti*, 40 (20 %) belong to *vata kapha*j *prakriti*, 60 (30 %) belong to *kapha vataj prakriti*, 20 (10 %) belong to *pitta kapha*j *prakriti*, 29 (14.5 %) belong to *kapha pittaj prakriti*, 21 (10.5 %) belong to *vata pittaj prakriti* and 30 (15%) belong to *pitta vataj prakriti*, 170 (85 %) were having *Rajasika Manas Prakriti*, 20 (10 %) were having *Satvik Manas Prakriti* and 10 (5 %) were having *Tamasika Manas Prakriti*, *Kapha*j *Shwitra* was observed in 141 (70.5 %) patients, *Pittaj Shwitra* was observed in 29 (14.5 %) patients and *Vataj Shwitra* was observed in 30 (15 %) patients**.**

HAM-D Score was normal in 13 (6.5 %) patients, HAM-D Score was mild in 96 (48 %) patients and HAM-D Score was moderate in 91 (45.5 %) patients, family history of *Shwitra* (Vitiligo) was present in 54 (27 %) patients, in 28 (14 %) patients only exposed area of body parts was affected with *Shwitra*, in28 (14 %) patients only unexposed area of body parts was affected with *Shwitra* and in 144 (72 %) patients both i.e. exposed as well as unexposed area of body parts was affected with *Shwitra*, VASI score was 1 (only specks of depigmentation are present) in 86 (43 %) patients followed by 2 (the pigmented area exceeds the depigmented area) in 72 (36 %), DLQI Score was not affected in 3 (1.5 %) patients, small affected in 91 (45.5 %), moderately affected in 95 (47.5 %) and largely affected in 11 (5.5 %) patients.

In this study there is 39.4% association between Gender and DLQI, 42% association between *Vyayam Shakti* and DLQI, 42.6% association between *manas prakriti* and DLQI, 42.6% association between *Satva* and DLQI, 39.4% association between area of *Shwitra* and DLQI and 38.3% association between VASI and DLQI was observed. No association observed between

Aahar shakti and DLQI, Sleep and DLQI, *Sharir Prakriti* and DLQI and Family History and DLQI.

In this study there is 43.9% association between Gender and HAM-D, 29.3% association between *Aahar Shakti* and HAM-D, 38.3% association between *Vyayam Shakti* and HAM-D, 37.5% association between sleep and HAM-D, 83.4% association between *Manas Prakriti* and HAM-D, 83.4% association between *Satva* and HAM-D, 38.3% association between VASI and HAM-D, 57.1% association between HAM-D and DLQI, 30.3% association between area of *Shwitra* and HAM-D. No association observed between HAM-D and *Sharir Prakriti*, Family History of *Shwitra* and HAM-D and Family History of *Shwitra* and VASI.

Discussion

Discussion on observations

Age: In this study maximum patients were belonging to third decade of the life. However most of the other reports reveal that mean age of onset was 2nd decade of life. This displays that the disease starts at a younger age in the Indian population (13, 14).

Gender: The female male ratio in this study was 1.5:1. Most of the other reports show equal male and female ratio (15). A few studies show slightly higher prevalence in female population as compared with male population (16,17). However some studies revealed exactly opposite observations, more prevalence in males than females (18, 19).

The number of female patients was found to be higher than male because female notice the changes in appearance early and approach the doctors sooner than men. Other reason is due to social stigma in the community, young females tend to report earlier due to matrimonial anxiety.

Marital status: Out of 200 *Shwitra* patients of Trial Group, 154 (77 %) were married and 46 (23 %) were unmarried.

Unmarried patients anticipated difficulties in getting married, women more than men. This was a special problem in villages. One female said that she had been rejected in five marriage proposals. One patient with Vitiligo limited to the extremities was being compelled by his parents to get married for fear that his Vitiligo would spread all over and mar his prospects of marriage if they delay.

In one case disease was not revealed to the partner at the time of marriage due to embarrassment or the fear of rejection. One patient had been rejected by her in – laws and told to get divorced if not cured.

Habitat: Out of 200 *Shwitra* patients of Trial Group, 107 (53.5%) were belonging to Urban habitat and 93 (46.5 %) were belonging to rural habitat. This is may be due to increased urbanization and situation of clinic (from where patients collected) in Vadodara city which is feasible for easy access of the urban population.

Religion: Out of 200 *Shwitra* patients of Trial Group, 186 (93 %) were belonging to Hindu religion, 13 (6.5 %) were belonging to Muslim religion and only 1 patient belongs to Christian religion. Highest incidence of Hindu volunteers may be due to study was done in Hindu predominant area.

Education: In this study Maximum patients were graduated; it may be due to increased awareness among people about education in the present era.
Occasional problem faced in college were difficulty in participation in gathering or competitions, preferring a correspondence course to a regular course in college. Some college going students have history of being teased in college by other students.

Occupation: Out of 200 *Shwitra* patients of Trial Group, 84 (42 %) were home maker, 3 (1.5 %) were labour, 55 (27.5 %) were doing office work, 2 (1 %) were from other (teaching profession), 16 (8 %) were doing sedentary work and 40 (20 %) were students (UG).

In present study Percentage of home maker is more. This may be due maximum number of female volunteers included in the study. The psychological impact on education, marriage and employment was felt most by young adults. Vitiligo had an impact on the choice of carrier with some jobs being denied to patients. These patients also face restricted career choices as the lesions that are present on the exposed body sites adversely affect their chances in the job interviews. It was disheartening to have to look for other careers on account of the disease.

Socio Economic Status: Maximum patients were belonging to middle Socio Economic Status. (Trial Group 150 (75 %) & Control Group 170 (85 %)).

Increased financial burden due to Vitiligo was also observed. Vitiligo patients often have to take leave from their jobs due to their hospital appointments for treatment. Not only the patient, but also the parents of children with Vitiligo have to take leave from work in order to accompany the child to the hospital (20).

Diet: Out of 200 *Shwitra* patients of Trial Group, 160 (80 %) consume vegetarian diet and 40 (20 %) consume mixed diet.

Maximum volunteers were Hindu and most of the Hindus were vegetarians. Another reason is all volunteers were belonging to Gujarat and most of the Guajarati were vegetarians.

Addiction: Out of 200 *Shwitra* patients of Trial Group, 137 (68.5 %) had habit of sipping tea, because tea is the most popular drink in the Indian people followed by 39 (19.5 %) with no specific habits, it may be due to large number of literate community with consciousness about good health practices, 16 (8 %) with habit of chewing tobacco, 5 (2.5 %) had habit of sipping coffee, 2 (1 %) had habit of smoking and 1 patient had habit of both smoking and tobacco.

Some people with depression may use substances to ease their symptoms. On the other side, substance use can aggravate mental illness symptoms. Research shows

that up to 1/3 of people with depression also get addicted to a substance use. This comorbidity is associated with an increased risk of suicide, social / personal impairment and other psychiatric conditions (21).

Bowel Habit: Out of 200 *Shwitra* patients of Trial Group, 178 (89 %) were having Regular, Satisfactory Bowel Habit and 22 (11 %) were having Irregular, Non-Satisfactory Bowel Habit, it may be due to improper diet and activities.

Sleep: Out of 200 *Shwitra* patients of Trial Group, 148 (74 %) were having sound sleep and 52 (26 %) were experiencing disturbed sleep. Disturbed sleep may be due to mental stress caused by diseased condition.

***Satva*:** Out of 200 *Shwitra* patients of Trial Group, 10 (5 %) were having *avara satva*, 170 (85 %) were having *madhyam satva* and 20 (10 %) were having *pravara satva*.

Satva means mental strength of an individual. According to Ayurveda *satva* (Mental strength) plays an important role in physical and mental health of the patient. Patients with *Avara Satva* suffer more from depression and hampered quality of life as compared with Patients with *Pravara Satva*.

Among *pravara satva* patient's regular exercise of yoga, pranayama and mediation was observed in about 68 % patents. According to one study in yoga, physical postures and breathing exercises improve muscle strength, flexibility, blood circulation, oxygen uptake and hormones function. Relaxation induced by mediation helps to stabilize the autonomic nervous system with a tendency towards parasympathetic dominance. Yoga practitioners become more resilient to stressful condition (22).

***Aahara Shakti*:** Out of 200 *Shwitra* patients of Trial Group, 152 (76 %) were having *Madhyam* (Moderate) *Aahar Shakti* and 48 (24 %) were having *Avara* (Poor) *Aahar Shakti*.

According to Ayurveda, *Aahara Shakti* means Abhyavaharana Shakti and Jarana Shakti. Abhyavaharana Shakti is capacity of intake of food. Jarana Shakti means capacity of digestion. (al, 2019;10(3)) *Avara* (poor / weak) digestive power is the root cause of all most all the diseases. Depression causes the weak digestive power and vice versa.

***Vyayam Shakti*:** Out of 200 *Shwitra* patients of Trial Group, 169 (84.5 %) were having *Madhyam* (Moderate) *Vyayam Shakti*, 29 (14.5 %) were having *Avara* (Poor) *Vyayam Shakti* and only 2 (1 %) were having *Pravara* (good) *Vyayam Shakti*.

***Sharir Prakriti*:** Out of 200 *Shwitra* patients of Trial Group, 40 (20 %) belong to *vata kaphaj prakriti*, 60 (30 %) belong to kapha vataj prakriti, 20 (10 %) belong to *pitta kaphaj prakriti*, 29 (14.5 %) belong to *kapha pittaj prakriti*, 21 (10.5 %) belong to *vata pittaj prakriti* and 30 (15%) belong to *pitta vataj prakriti*.

In this study, in both Groups patients with *eka doshaja* and *sama doshaja prakriti* (constitution) was not observed. Individual with *Eka doshaja* and *sama doshaja prakriti* (constitution) are difficult to find.

***Manas prakriti*:** Out of 200 *Shwitra* patients of Trial Group, 170 (85 %) were having *Rajasika Manas Prakriti*, 20 (10 %) were having *Satvik Manas Prakriti* and 10 (5 %) were having *Tamasika Manas Prakriti*.

According to Ayurveda *manas prakriti* (mental constitution) is of 3 types *satvik, rajasika* and *tamasika*. *Manas prakriti* (mental constitution) is determined by comparative predominance of *sattva, raja* and *tama* qualities. Patients with *sativk prakriti* have good mental strength as compared to other *prakriti* while patients with *tamas prakriti* have less mental strength as compared to others.

HAM-D: Out of 200 *Shwitra* patients of Trial Group, HAM-D Score was normal in 13 (6.5 %) patients, HAM-D Score was mild in 96 (48 %) patients and HAM-D Score was moderate in 91 (45.5 %) patients. Dabas et al, by using PHQ – 9, found that the prevalence of depression among their study in India was 27.4 % which was lesser than that in our study (23). Clinical assessment of depression by psychiatrists is recommended.

Prevalence of depression and depressive symptoms varies among the studies depending on the diagnostic criteria or instruments used (24).

Patients were unhappy with the way they now looked and this had completely challenged the way they felt about themselves. The disease was a cause for worry, depression and low self – esteem. Some patients thought about their Vitiligo all day, some whenever they looked in the mirror and some not at all.

Family History of *Shwitra*: In this study family history of *Shwitra* (Vitiligo) was present in 54 (27 %) patients. Genetic factors play an important role in manifestation of Vitiligo. Familial occurrence has been reported to vary from 5 to 30 % in different studies (25, 26, 27, 28). Human leucocyte antigen (HLA) type significantly related to family history and early onset of Vitiligo (29). Positive family history is considered to be a poor prognostic factor (30). Patients having family history received adequate support from their family members including moral support, money for treatment and being accompanied by family members on visit to the doctor. This was a great comfort to them. But patients carried a burden of guilt and fear that their disease could spread to others in the family or affect the prospects of marriage of other family members. Patients with a family history of Vitiligo were found to be significantly less worried by their disease as compared to patients with no family history of Vitiligo.

Area of *Shwitra*: Out of 200 *Shwitra* patients of Trial Group, in 28 (14 %) patients only exposed area of body parts was affected with *Shwitra*, in28 (14 %) patients only unexposed area of body parts was affected with *Shwitra* and in 144 (72 %) patients both i.e. exposed as

well as unexposed area of body parts was affected with *Shwitra*.

A few patients who had Vitiligo on the exposed areas had minimized attending social functions and meeting people as they were ashamed of their disease. They were teased by children and some time by elders also and avoided shaking hands with other people. They were irritated with queries of normal people. Those who had Vitiligo on covered areas had no difficulty in social interaction.

Type of *Shwitra*: Out of 200 *Shwitra* patients of Trial Group, *Kaphaj Shwitra* was observed in 141 (70.5 %) patients, *Pittaj Shwitra* was observed in 29 (14.5 %) patients and *Vataj Shwitra* was observed in 30 (15 %) patients.

VASI Score: Out of 200 *Shwitra* patients of Trial Group, VASI score was 1 (only specks of depigmentation are present) in 86 (43 %) patients followed by 2 (the pigmented area exceeds the depigmented area) in 72 (36 %).

DLQI Score: Out of 200 *Shwitra* patients of Trial Group, DLQI Score was not affected in 3 (1.5 %) patients, small affected in 91 (45.5 %), moderately affected in 95 (47.5 %) and largely affected in 11 (5.5 %) patients.

Vitiligo was associated with feeling of embarrassment and interfered with patient's choice of clothing (31). Patient wore clothes that covered their Vitiligo.

Patients were unhappy with the way they now looked and this had completely challenged the way they felt about themselves. In various other studies, impairment of Quality of Life was predicted by the extent of disease and self – assessed disease severity (32, 33, 34).

In Indian patients with greater than 10 % body surface area involvement, the mean DLQI was found to be 10.67 (35).

Discussion on statistical analysis

Gender * DLQI: In this study there is 39.4% association between Gender and DLQI was observed. DLQI score was higher in female, which correlates with other studies (36). The higher DLQI score in female patients is probably due to the greater social consequences in women.

***Vyayam Shakti* * DLQI:** in this study there is 42% association between *Vyayam Shakti* and DLQI. *Vyayam Shakti* was *avara* (poor) in 29 patients; all were suffering from hampered quality of life. *Vyayam Shakti* was *pravara* (strong) in 2 patients; 1 was normal while 1 was suffering from small effect on quality of life.

***Manas Prakriti* * DLQI:** in this study there is 42.6% association between *manas prakriti* and DLQI. This study shows that Patients having *satvik prakriti* also have normal quality of life or little effect on quality of life. Patients having *tamas prakriti* suffered a lot from small – large effect on quality of life.

Satva * DLQI: in this study there is 42.6% association between *Satva* and DLQI. This study includes 10 patients of *Avara Satva* (Weak mental strength), all suffering from hampered quality of life. 20 patients of *Pravara Satva* (Strong mental strength), out of these 2 were normal and 18 were having little effect on quality of life.

Satva means mental strength of an individual. According to Ayurveda *satva* (Mental strength) plays an important role in physical and mental health of the patient. Patients with *Avara Satva* suffer more from depression as compared with Patients with *Pravara Satva*. This clearly signifies importance of *Satva* in prevention of depression.

VASI * DLQI: in this study there is 38.3% association between VASI and DLQI. In this study there is 38.3% association between VASI and DLQI. One study showed that there was a significant positive correlation between VASI score and dermatology life quality index (37).

Area of *Shwitra* * DLQI: 39.4% association between area of *Shwitra* and DLQI. This study showed that patients with Vitiligo lesions on exposed or both (exposed and unexposed) parts of the body were significantly associated with poor quality of life; previous studies also supported the concept (38).

***Aahar Shakti* * DLQI:** in this study no association was observed between *Aahar Shakti* and DLQI.

Sleep * DLQI: in this study no association was observed between Sleep and DLQI.

***Sharir Prakriti* * DLQI:** in this study no association was observed between *sharir prakriti* and DLQI.

Family History * DLQI: in this study no association was observed between family history of *Shwitra* and DLQI. Patients with family history of *Shwitra* received adequate support from their family members including moral support, money for treatment and being accompanied by family members on visits to the doctor. This was a great comfort to them.

Gender * HAM-D: In this study there is 43.9% association between Gender and HAM-D. The prevalence of depression in female with Vitiligo was higher than that in male. According to earlier meta – analysis, the prevalence of depression in female with Vitiligo was significantly higher than that in male (39).

***Aahar Shakti* * HAM-D:** In this study there is 29.3% association between *Aahar Shakti* (digestive power) and HAM-D. *Aahara Shakti* was *avara* (weak) in 48 patients of which 45 were suffering from depression. While *Aahara Shakti* was *madhyam* (moderate) in 152 patients of which 142 were suffering from depression.

Avara (poor / weak) digestive power is the root cause of all most all the diseases. Depression causes the weak digestive power and vice versa.

***Vyayam Shakti* * HAM-D:** In this study there is 38.3% association between *Vyayam Shakti* and HAM-D. *Vyayam Shakti* was *avara* (poor) in 29 patients out of which 27 were suffering from depression. *Vyayam Shakti* was *pravara* (strong) in 2 patients; no depression was observed in these patients.

Sleep * HAM-D: In this study there is 37.5% association between sleep and HAM-D. Out of 200 patients 52 were having disturbed sleep. 10 patients with disturbed sleep were having mild depression, 40 were having moderate depression and 2 were normal. Due to depression disturbed sleep was observed. One study showed that sleep disturbance in 20 % of patients having Vitiligo (40).

***Manas Prakriti* * HAM-D:** In this study there is 83.4% association between *Manas Prakriti* and HAM-D. Satvik manas prakriti was observed in 20 patients, out of them 7 were having mild depression and 13 were normal. Rajasika manas prakriti was observed in 170 patients, out of them 89 were having mild depression and 81 were having moderate depression. Tamasika manas prakriti was observed in 10 patients, all were suffering from moderate depression. This study showed that Patients having *satvik prakriti* were normal or suffered less from depression. While patients having *tamas* or *rajas manas prakriti* suffered a lot from mild – moderate depression.

***Satva* * HAM-D:** In this study there is 83.4% association between *Satva* and HAM-D. Pravara satva was observed in 20 patients, out of them 7 were having mild depression and 13 were normal. Madhyam satva was observed in 170 patients, out of them 89 were having mild depression and 81 were having moderate depression. Avara satva was observed in 10 patients, all were suffering from moderate depression.

Satva means mental strength of an individual. According to Ayurveda *satva* (Mental strength) plays an important role in physical and mental health of the patient. Patients with *Avara Satva* suffer more from depression as compared with Patients with *Pravara Satva*. This clearly signifies importance of *Satva* in prevention of depression.

VASI * HAM-D: In this study there is 38.3% association between VASI and HAM-D. VASI score was 1 in 86 patients, out of them 48 were having mild depression, 27 were having moderate depression and 11 were normal. VASI score was 2 in 72 patients, out of them 38 were having mild depression, 32 were having moderate depression and 2 were normal. VASI score was 3 in 12 patients, out of them 4 were having mild depression and 8 were having moderate depression. VASI score was 4 in 12 patients, out of them 2 were having mild depression and 10 were having moderate depression. VASI score was 5 in 18 patients, out of them 4 were having mild depression and 14 were having moderate depression.

One study showed that there was a significant positive correlation between VASI score and Hamilton depression (41).

Family History Of *Shwitra* * HAM-D: in this study no association was observed between family history of *Shwitra* and HAM-D. Family history of shwitra was present in 54 patients, out of them 25 were having mild depression, 24 were having moderate depression while 5 were normal. Family history of shwitra was absent in 146 patients, 71 were having mild depression, 67 were having moderate depression and 8 were normal.

Patients with family history of *Shwitra* received adequate support from their family members including moral support, money for treatment and being accompanied by family members on visits to the doctor. This was a great comfort to them.

Area Of *Shwitra* * HAM-D: there is 30.3% association between area of *Shwitra* and HAM-D. 28 patients were having Vitiligo on exposed body parts, out of them 17 were having mild depression, 8 were having moderate depression and 3 were normal. 28 patients were having Vitiligo on unexposed body parts, out of them 17 were having mild depression, 6 were having moderate depression and 5 were normal. 144 patients were having Vitiligo on exposed and unexposed (both) body parts, out of them 62 were having mild depression, 77 were having moderate depression and 5 were normal.

High HAM-D score was observed in patients with disease on the exposed part or both parts (exposed and unexposed) of the body. Previous research also observed the same (42).

DLQI * HAM-D: In this study there is 57.1% association between HAM-D and DLQI was observed. Dermatology life quality index was largely affected in 11 patients; all were suffering from moderate depression. Dermatology life quality index was moderately affected in 95 patients, out of them 36 were suffering from mild depression and 59 were suffering from moderate depression. Dermatology life quality index was small affected in 91 patients, out of them 59 were suffering from mild depression, 21 were suffering from moderate depression and 11 were normal.

Patient whose quality of life was affected had depressive symptoms and vice versa. Previous studies also show the similar pattern (43).

***Sharir prakriti* and HAM-D:** In this study no association was observed between *sharir prakriti* and HAM-D.

Family History of Vitiligo and VASI: no association was observed between family history of *Shwitra* and VASI score of patients.

Conclusion

Vitiligo has a major impact on the quality of life of the patient and high prevalence of the depression, especially in those with lesions on exposed part of the body. The chronic nature of the disease, long term treatment, lack of uniform effective therapy, unpredictable prognosis of the disease and treatment causes psychological burden contributing to compromised quality of life as well as depression in patients. An empathetic and supportive doctor – patient interaction, information regarding Vitiligo, early treatment, good social support, and psychotherapeutic mediations can help the patient to live with their disease and to manage the associated psychological comorbidity.

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