

Suicidal ideation associated with vitiligo - A systematic review of prevalence and assessment

Somanaboina Padmakar^a, Krishna Murti^b, Krishna Pandey^c, Sweta Kumari^a,
Rishikesh Kumar^d, Niyamat Ali Siddiqui^d, Biplab Pal^{a,*}

^a Department of Pharmacology, Lovely Professional University, Punjab, 14411, India

^b Department of Pharmacy Practice, National Institute of Pharmaceutical Education and Research, Hajipur, 844102, Bihar, India

^c Department of Clinical Medicine, Rajendra Memorial Research Institute of Medical Sciences (Indian Council of Medical Research), Agamkuan, Patna, 800007, Bihar, India

^d Department of Biostatistics, Rajendra Memorial Research Institute of Medical Sciences (Indian Council of Medical Research), Agamkuan, Patna, 800007, Bihar, India

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ABSTRACT

Background: Vitiligo is a chronic dermatological condition associated with an increased risk of psychiatric disorders, including Suicidal Ideation (SI). Therefore, understanding of SI in patients with vitiligo is critically important. This systematic review aimed to investigate the assessment, and prevalence of SI in vitiligo patients. **Method:** This systematic review was prepared according to the PRISMA statement. We searched PubMed, Scopus, Google Scholar, and additional sources to find out relevant articles. Study selection, data extraction, and quality assessment were carried out independently by two reviewers. We used the Joanna Briggs Institute critical appraisal checklist tool to assess the methodological quality of the included study.

Findings: Six studies involving 516 vitiligo patients were included in the analyses. The prevalence of suicidal ideation ranged from 6% to 25%. Two studies relied on 28 items General Health Questionnaire (GHQ) and the remaining studies used the Hamilton Rating Scale for Depression (HDRS), Beck Depression Inventory (BDI), Quick Inventory of Depressive Symptomatology- Self Report-16 (QIDS-SR-16) and Diagnostic and Statistical Manual of Mental Disorders (DSM-5).

Conclusion: Clinicians should aware that a significant proportion of vitiligo patients are exposed to the risk of suicide. Therefore, it is recommended that vitiligo patients should be screened for suicidal ideation and make appropriate referrals to treat their psychiatric morbidities.

1. Introduction

Vitiligo is a complex disease with underlying immune destruction of epidermal melanocytes and characteristic hypopigmented or depigmented macular and patchy skin lesions.¹ The lesions have well-demarcated white or depigmented macules or patches that are oval, round, or linear in shape with convex borders measuring from a few millimeters to centimeters and enlarge centrifugally.² The global prevalence of vitiligo has been estimated to be between 0.1 and 8%.³

Knowledge on the etiopathogenesis of vitiligo is evolving; multiple mechanisms are thought to be involved, including genetic predisposition, environmental triggers, neural mechanisms, metabolic/physiological stress, and altered inflammatory and autoimmune responses.^{4,5} Environmental factors such as ultraviolet rays and chemicals may

worsen vitiligo by causing gene damage or melanocyte stress.⁵ According to the neural hypothesis, the release of neurogenic factors in response to a stressful event has an impact on melanocytes survival.⁶ The loss of melanocytes was also reported to be caused by an autoimmune reaction.⁷ According to the ROS model, faulty oxygen metabolism leads to an excess of reactive oxygen species (ROS), which causes melanocyte destruction.⁸

Vitiligo has a significant impact on the personal and social life of the affected individual due to cosmetic disfigurement.⁹ The patient may suffer from embarrassment, discomfort, depression, and social isolation, and may go into hiding especially when the lesion appears on the exposed part of the body. This may ultimately impact the relationship with friends and relatives. Some people are embarrassed, ashamed, depressed, worried about how others will react,^{10,11} and fear of their

* Corresponding author. Department of Pharmacology, School of Pharmaceutical Sciences, Lovely Professional University, Punjab, India.

E-mail address: biplab2006pal@gmail.com (B. Pal).

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'disease spreading.¹²

Depression is a common mental illness that affects a patient's health-related quality of life and satisfaction with medical care.^{13,14} Female sex, lesion location in visible areas, younger age, and extensive body area involvement were all significantly associated with higher psychosocial or overall QoL burden.¹⁵ Longer disease duration (>5 years), unmarried and/or single relationship status, progressive disease, lower education status, non-segmental vitiligo, a positive family history of vitiligo, and a higher socioeconomic level were found to be associated with an increased psychosocial burden.^{15,16}

To the best of our knowledge, no systematic review on SI in vitiligo was done. Therefore, we planned to summarize the prevalence and assessment of SI in patients with vitiligo.

2. Methods

2.1. Literature search methods

We performed a systematic review of observational studies on the suicidal ideation associated with vitiligo, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We systematically search the following databases PubMed, Scopus, and Google Scholar. The search was limited to peer-reviewed articles published in English language. To achieve the maximum sensitivity of the search strategy, we combined the terms: "vitiligo" AND ("suicidal ideation" OR "suicide" OR "suicidality" OR "self-harm ideation" OR "suicidal behavior" OR "suicidal risk assessment" OR "suicidal ideation assessment" OR "suicidal prevalence"). Studies published from inception to September 20, 2021, were included in this review. Subsequently, we assessed the abstracts of all potentially relevant articles to see if they met the eligibility criteria. Finally, we screened the bibliography lists of all the selected articles to identify additional relevant studies.

2.2. Eligibility criteria

We included all the cross-sectional, case-control, or cohort studies that evaluated the prevalence of SI in patients with vitiligo using validated tools. Case reports, case series, review articles, letters to the editor, and psychometric studies were excluded.

2.3. Selection of studies and data extraction

To select potential studies, the titles and abstracts were reviewed, followed by a full-text review by the two authors independently. The following data were collected using a standardized reporting form created in Microsoft Excel: First author, publication year, country, setting, sample size, study design, the prevalence of SI, eligibility criteria, and assessment tools.

2.4. Quality assessment

The methodological quality of the included articles were independently assessed by two reviewers using a critical appraisal checklist prepared by the Joanna Briggs Institute (JBI).¹⁷ In case of discrepancy arose between reviewers, consultation of a third investigator was taken to reach a consensus. JBI critical appraisal checklist consisted of 9 questions (Q1- Q9) related to sampling frame, sampling methods, sample size, study subjects, and statistical analysis. The total scores ranged from 0 to 9. Studies that scored more than 5 for 'Yes' ratings were included in this review. The details of the quality assessment are shown in Table 2.

3. Results

A total of 6 articles that meet study illegibility criteria were included (Fig. 1). Included studies were conducted in Egypt (n = 2), Iran (n = 1), and India (n = 3). The majority of studies were from India and recruited patients from dermatology settings. Most of the included studies were cross-sectional (n = 5, 83.3%), followed by case-control (n = 1, 16.6%).

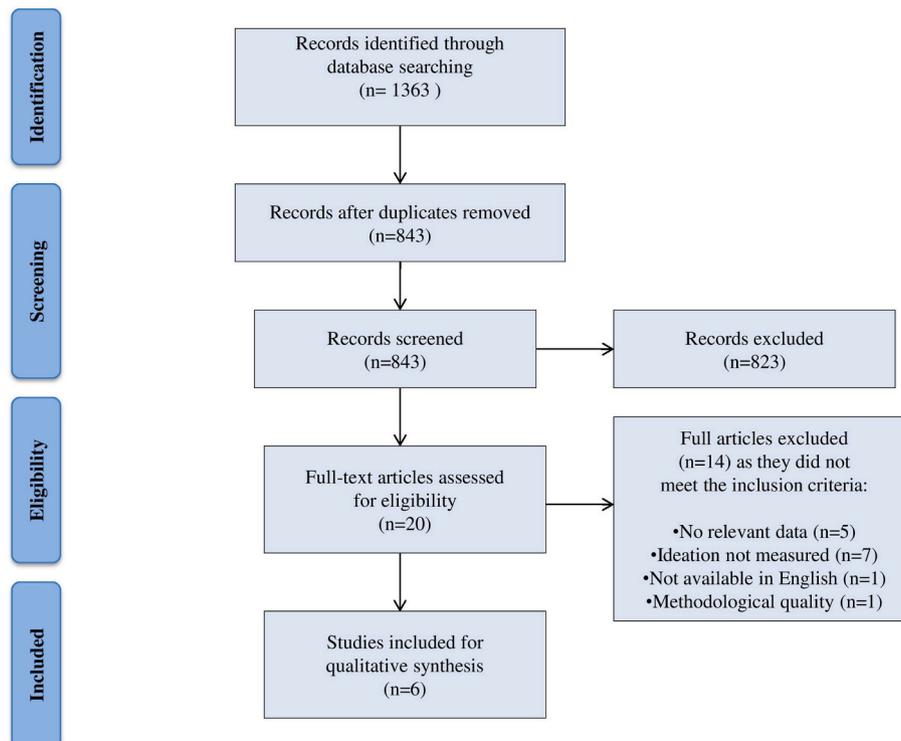


Fig. 1. PRISMA flow diagram.

3.1. Methodological quality

All the included studies scored between 6 and 9 and were considered an acceptable quality for inclusion in this review. A total of three studies did not mention the sampling procedure and carry the unclear risk of bias.^{14,18,19} Similarly, five different studies had smaller sample size hence, carries the risk of bias related to the precision of results.^{14,18–21} All the studies were free from coverage and measurement bias. One study had missing or unclear information related to the sample size, study subjects, and study settings, and thus scored less than 6 were excluded from this review.²² The results of the methodological quality assessment are presented in [Table 1](#).

3.2. Prevalence of suicidal ideation

The prevalence rate of SI varied substantially across studies. Prevalence of SI ranged from as low as 6%, using a general health questionnaire (GHQ), in a sample of adults (18–65years) diagnosed with vitiligo¹⁸ to as high as 25%, using a DSM-5 in a sample of 109 patients.¹⁴ The detailed prevalence data are shown in [Table 2](#).

3.3. Assessment of suicidal ideation

Different tools were used for the measurement of SI across the studies. Two different studies used 28 items general Health Questionnaire (GHQ) (n = 2)^{18, 21}, and the remaining studies relied on item 3 from the Hamilton Rating Scale for Depression (HRDS) (n = 1)²⁰, item 9 from the Beck Depression Inventory (BDI) (n = 1)¹⁹, item 12 from Quick Inventory of Depressive Symptomatology- Self Report 16 (QIDS-SR 16) (n = 1)²³ scale and Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (n = 1).¹⁴

4. Discussion

The skin plays a crucial role in socialization. Cosmetically disfiguring skin diseases, mainly those appearing on exposed areas of the body, and face may lead to significant feelings of social isolation, thereby increasing the risk of suicidality.²⁴ In contrast to many other organs in the body, the human epidermis reacts immediately to psychological stress, so several authors aimed to prove the brain-skin connection.²⁵ The effect of visible skin disorders extended beyond physical symptoms to psychosocial problems.²⁶ Aslam et al. concluded that skin diseases such as acne, pruritus, urticaria, vitiligo, and alopecia areata have a high prevalence of psychiatric diseases.²⁷ Silvan et al. emphasized that up to 80% of dermatology patients have psychiatric symptoms.²⁸ Chronic skin diseases can lead to depression, which in turn increases the risk of SI, attempted suicide, or suicide.²⁹ The purpose of this study was to assess the prevalence of SI in vitiligo patients based on previous studies that looked at suicidal behavior in this population.

Vitiligo is usually very frustrating for patients due to its chronic nature, long treatment course, lack of uniform curative management, and unpredictable course.³⁰ Patients may also suffer from low

self-esteem, embarrassment, sorrow, and social exclusion as a result of lesions in exposed parts of the body. Although vitiligo patients have no symptoms other than discolored patches of skin, this pathology is associated with a wide variety of psychological problems including anxiety, depression, and even SI.³¹ A recently published meta-analysis by Kussainova et al. reported that a significant proportion of vitiligo patients have anxiety symptoms, with the prevalence of anxiety ranging from 4.76% to 60.0%.³² The prevalence of SI in the included studies ranged from 6% to 25%. The difference in prevalence rate could be due to the variation in tools used in studies, skin type, and severity of the condition. In addition, the cultural background of the patients might also play a role in the variation in prevalence. The prevalence of SI in other dermatological diseases was found to be 1.2%, 5.4%, and 2.6% in acne vulgaris, psoriasis, and alopecia respectively.³³ A study conducted by Dieris-Hirche et al. in which the prevalence rate of SI was 16% in atopic dermatitis.³⁴ In another study, SI was found to be 18.5% of patients with chronic pruritus and 11.8% of those with atopic dermatitis.³⁵ Limited studies on suicidal ideation in vitiligo patients are available and all the eligible studies were from developing countries hence, more studies need to be conducted throughout the globe to get a clear prevalence of suicidal ideation.

There is no specific questionnaire for assessing suicidal ideation in vitiligo. The method of assessment of SI varied significantly depending on the instruments used. All studies measured SI as a part of the assessment of psychiatric disorders in vitiligo patients. One or a few items of the questionnaires were used for the assessment of SI. Four questions of the GHQ-28 questionnaire containing questions related to death or suicide were used by two different studies. Item 3 of HRSD, item 6 of DSM-5, item 9 of BDI, and item 12 of QIDS-SR-16 questionnaires containing questions about suicidal thoughts or behavior were used for the measurement of SI.

Different instruments were used for assessing SI in vitiligo patients. Two different studies in our review relied on the GHQ questionnaire to assess the psychological morbidities in vitiligo patients. GHQ is a self-administered instrument designed for screening and assessing psychological morbidities.³⁶ It is a well-validated instrument translated into many different languages. Different versions of GHQ are available consisting of 12, 28, 30, and 60 questions. Both the scales have also been widely used for assessing SI in many other dermatological disorders.^{37,38}

Hamilton Rating Scale for Depression (HDRS) was another popular tool used for suicidal ideation. The 17-item version of the HDRS is the most widely used scale for controlled clinical studies on depression.³⁹ The HDRS is also used in other skin conditions like psoriasis, and allergic disorders to assess psychiatric disorders.⁴⁰ This scale has 17 items, nine of which are scored on a 5-point range (0–4) and the other eight on a 3-point scale (0–2); higher scores indicate greater depression. Scores reflect symptoms that are (0) absent; (1) doubtful or trivial; (2) mild; (3) moderate; or (4) severe for 5-point items, whereas, for 3-point items, scores reflect symptoms that are (0) absent; (1) doubtful, trivial, or mild; and (2) severe.⁴¹

Another tool used for SI measurement was the Beck Depression Inventory (BDI). This scale has also been widely used in different health

Table 1

JBI Critical Appraisal Checklist for included studies.

| Author | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Total scores |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------|
| Sorour et al. ^[14] | Yes | U | No | Yes | Yes | Yes | Yes | Yes | Yes | 7 |
| Saleh et al. ^[18] | Yes | U | No | Yes | Yes | Yes | Yes | Yes | Yes | 7 |
| Layegh et al. ^[19] | Yes | U | No | Yes | Yes | Yes | Yes | Yes | Yes | 7 |
| Sangma et al. ^[20] | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | 8 |
| Sharma et al. ^[21] | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | 8 |
| Kota et al. ^[23] | Yes | 9 |

Q1 Was the sample frame suitable for the target population? Q2 Were study subjects sampled appropriately? Q3 Was the sample size appropriate? Q4 Were the study subjects and the setting discussed in detail? Q5 Was the data analysis carried out with adequate coverage of the identified sample? Q6 Were objective, standard criteria used to identify the condition? Q7 Was the condition measured reliably? Q8 Was appropriate statistical analysis performed? Q9 Was the response rate sufficient, and if not, was the low response rate managed properly. U: unclear.

Table 2
Summary of collected data included in this review.

| First Author, Year, Country | Sample Size | Purpose | Study population and Study setting | Study design | Criteria of eligible population | Prevalence of SI | Measurement of SI | Ref. |
|--------------------------------|-------------|--|---|-----------------------|---|------------------|---|--------------|
| Kota RS et al. (2019), India | 150 | To observe the difference in quality of life and depression levels in vitiligo patients | Both genders aged ≥ 18 , Dermatology department of a tertiary care hospital | Cross-Sectional Study | Patients of both genders, aged ≥ 18 years with clinical diagnosis of vitiligo were included Depigmentation caused by factors other than vitiligo and those with previously diagnosed psychiatric conditions were excluded | 23.3% | Question 12 (Thoughts of Death or Suicide) of QIDS-SR 16 | [23] |
| Sorour F et al. (2017), Egypt | 108 | Evaluation of psychiatric co-morbidities in chronic dermatological diseases in Egyptian patients | Both genders, aged between 17 and 60 years, Outpatient clinics of 3 major hospitals | Cross-Sectional study | Patients of both genders, aged between 17 and 60 years and suffering from vitiligo for 6 months were included Patients with psychiatric disorders, chronic systemic diseases, and receiving treatment with corticosteroid or isotretinoin were excluded | 25% | Question 6 (Thoughts of death or hurting yourself) of DSM-5 questionnaire | [14] |
| Sangma LN et al. (2015), India | 100 | To assess the quality of life, as well as psychological morbidity like depression in a vitiligo patient | Both genders aged between 18 and 40 years, Outpatient Department of dermatology and Venereology of a tertiary care hospital | Case-Control study | Patients of both genders, aged between 18 and 40 years and willing to participate in the study were included. Patients with personal or familial mental illness, substance abuse, or any other apparent causes of depression were excluded | 8% | Question 3 (Suicide) of HRSD | [20] |
| Layegh P et al. (2010), Iran | 78 | Evaluating the depression and suicidal ideation in psoriasis (n = 62), acne vulgaris (n = 78), alopecia areata (n = 73), and vitiligo (n = 87) | Both genders, a Mean (\pm SD) age of 26.5 (± 10.8) years Hospital | Cross-Sectional study | Male and female patients of both genders, without a history of psychiatric or cognitive disorders, brain damage, or epilepsy, and did not take alcohol or narcotic drugs for at least one month prior to participating in the study were included Patients who were unable to completely fill the BDI questionnaire were excluded | 18.4% | Question 9 (Suicidal thoughts or wishes) of BDI | [19] |
| Saleh HM et al. (2008), Egypt | 50 | To assess the psychiatric morbidity and quality of life in patients with vitiligo, psoriasis, and alopecia areata | Both genders, aged between 18 and 65 years, Dermatology department of hospital | Cross-Sectional Study | Patients of both genders, aged between 18 and 65 years and the disease duration of 1–26 years were included Patients with chronic debilitating diseases, pregnant or lactating women, and patients receiving antipsychotic drugs were excluded | 6% | Four questions on the GHQ-28 usually ask about suicidal thoughts or SI as follows: 1. Do you feel that life isn't worth living? 2. Do you think of the possibility that you might do away with yourself? 3. Do you find yourself wishing you were dead and away from it all? 4. Do you find that the idea of taking your own life kept coming into your mind? | [18] [21] |
| Sharma N et al. (2001), India | 30 | To assess the psychiatric morbidity related to vitiligo and psoriasis | Both genders aged between 18 and 60 years, Dermatology department of hospital | Cross-Sectional study | Newly diagnosed, treatment naïve vitiligo patients of both genders, aged between 18 and 60 years were included | 10% | | |

QIDS-SR 16- Quick Inventory of Depressive Symptomatology- Self Report-16, DSM 5- Diagnostic and Statistical Manual of Mental Disorders, HRSD-Hamilton Rating Scale for Depression, BDI- Beck Depression Inventory, GHQ-General Health Questionnaire, I- Inclusion, E- Exclusion, NM- Not mentioned, Ref- Reference.

care studies.⁴² The BDI is a 21-questions, self-report inventory that is one of the most widely used tools for assessing the severity of depression. The BDI consists of 21 questions, each of which is rated on a scale of 0–3. Questions 1–13 measure psychological symptoms while 14–21 measure physical symptoms.³³ Cronbach alpha reliability coefficient of this scale was 0.92.⁴³ This scale was also applied to many other dermatological diseases like acne vulgaris,⁴⁴ psoriasis,⁴⁵ and atopic dermatitis.⁴⁶

QIDS-SR 16 and DSM-5 were some other tools used in the measurement of SI. The QIDS-SR is a brief self-report rating scale derived from the 30-item Inventory of Depressive Symptomatology.⁴⁷ It consists of 16 items arranged in nine domains, sixth domain is related to thoughts of death or suicide.⁴⁸ It has strong psychometric properties and is sensitive to treatment changes.⁴⁹ DSM-5 was developed by the American Psychiatric Association and provides a list of criteria for the diagnosis of

mental health disorders. The different psychiatric illnesses that can be measured by DSM-5 are depression, anxiety, suicide ideation, suicide attempt, sleep disorders, obsessive-compulsive diseases, and sexual problems.⁵⁰

Most of the studies used a single item for the assessment of suicidality. The use of a single item for the assessment of SI is sometimes problematic because it may fail to report the episodic nature of SI.⁵¹ However, Desseilles et al. demonstrated that using a single item from an instrument for the measurement of SI could be a valid approach.⁵²

5. Study limitations

The data was obtained from a variety of studies with different designs and screening instruments. The prevalence of suicidal ideation in vitiligo may vary because the studies were heterogeneous in terms of screening tools, sampling methods, disease severity, and socioeconomic status of patients. Studies were conducted in India, Egypt, and Iran, making the generalizability of findings limited. Only English language studies were included and thus, non-English language studies were missed, and also the possibility of recall bias in the assessment of SI could not be excluded. A multi-center study using a single validated tool would give a more precise result of the prevalence of SI in vitiligo patients.

6. Conclusion

Suicidal ideation is common in patients with vitiligo. With the prevalence of vitiligo, the need for increased screening for suicidal ideation is also essential. Physicians should actively screen SI in patients with vitiligo and may take appropriate interventions to reduce the risk of suicide. A future systematic review of risk factors associated with suicidal ideation and behavior in vitiligo patients is recommended.

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Ethical approval

It is not applicable.

Author's contributions

B.P, S.K, & K.M contributed to the conception of work, manuscript revising, editing and approval of manuscript final; S.P & K.P contributed to methodology, data collection, and writing review, R.K & N.A.S contributed to visualization, data analysis and interpretation.

Declaration of competing interest

The authors state that they do not have any competing interests.

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