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A Cross Sectional Study on Clinical Spectrum and Quality of Life in Childhood Vitiligo in Tertiary Care Hospital

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Conflict of interest: Nil

Abstract

Background: Vitiligo is a common acquired depigmentary disorder, often appearing before age 20. Though not physically harmful, it can severely affect children's self-esteem and social well-being due to its visible nature. Despite this, the psychological impact is often overlooked in clinical care. This study evaluates the clinical patterns and quality of life in children with vitiligo using the Childhood Dermatology Life Quality Index (CDLQI).

Aim and Objectives: This study aims to evaluate the clinical spectrum of vitiligo and assess its effects on the quality of life in affected children.

Material and Method: This hospital-based cross-sectional study was conducted from September to December 2024 at Santhiram Medical College and General Hospital, Nandyal, Andhra Pradesh. Fifty children aged 6–16 years with clinically diagnosed vitiligo were included. Data on demographics, clinical characteristics, and disease parameters were collected. The quality of life was assessed using the Childhood Dermatology Life Quality Index (CDLQI). Statistical analysis was performed using SPSS version 23, with a p-value < 0.05 considered statistically significant.

Results: The study included 28 girls and 22 boys with a mean age of 11.06 ± 3.1 years. Vitiligo vulgaris (52%) was the most common clinical type. The mean disease duration was 2.0 ± 1.77 years, with a positive family history noted in 20% of cases. The mean CDLQI score was 8.05 ± 6.77, indicating a moderate overall impact on quality of life. Significant associations were found between quality of life and sex, type of vitiligo, duration of disease, VASI score, and VIDA score ($p < 0.05$). Age and family history showed no significant correlation.

Conclusion: Vitiligo significantly impairs the quality of life in affected children, particularly with longer disease duration, active disease, and extensive skin involvement. These findings emphasize the need for a holistic management approach that includes both medical and psychosocial support for pediatric vitiligo patients.

Keywords: Vitiligo, Childhood, Quality of Life, CDLQI, Clinical Spectrum, VIDA score, VASI score, Cross-sectional Study.

Introduction

Vitiligo is an acquired disorder of pigmentation characterized by the formation of asymptomatic usually, depigmented/achromic macules and patches resulting from progressive loss of mature melanocytes.[1]

It has been estimated that vitiligo affects between 0.5% and 2% of people worldwide. Nearly half of the cases are found in individuals younger than 20 years old.[2,3] The pathophysiology of vitiligo remains incompletely understood. The most widely acknowledged theory is the autoimmune hypothesis.[18]

Vitiligo is classified into Segmental vitiligo, Undetermined/Unclassified vitiligo: Focal, Mucosal vitiligo affecting 1 site, Non-segmental vitiligo: mucosal, generalized, universal, mixed, Raretypes: follicular vitiligo.[18]

Children with chronic skin conditions may experience even lower self-esteem than those with serious systemic illnesses, largely due to the visible nature of skin disorders, which can result in psychological distress—including depression, anxiety, embarrassment—and may eventually lead to social isolation.[4-9]

Vitiligo negatively affects a patient's quality of life due to its association with social stigma.[16,17.] In the care of individuals with chronic dermatologic conditions, physicians often prioritize the treatment of visible skin symptoms, frequently neglecting the psychological and social consequences that significantly affect patients' overall quality of life.[10-15]This study aims to evaluate the clinical spectrum of vitiligo and assess its effects on the quality of life in affected children.

Materials and methods

This hospital-based cross-sectional study was conducted from September to December 2024 involving pediatric patients with vitiligo attending the Dermatology, Venereology, and Leprosy Outpatient Department at Santhiram Medical College and General Hospital, Nandyal, Andhra Pradesh. Fifty children aged between 6 and 16 years, along with their parents, were enrolled after obtaining informed consent. Inclusion criterion was limited to children capable of reading and writing, while those unwilling to participate, those who did not provide informed consent, and those with other dermatological or systemic conditions potentially affecting quality of life were excluded.

Comprehensive medical histories were obtained, including data on age, sex, disease duration, type and distribution of vitiligo, and family history. A clinical diagnosis was confirmed through physical examination conducted by the primary investigator under mentor supervision. To evaluate quality of life, the Persian version of the Childhood Dermatology Life Quality Index (CDLQI) was administered. This instrument includes ten items addressing pruritus, emotional well-being, sleep, social and academic activities, leisure, clothing, eating habits, bathing, and treatment. Each item is scored on a scale from 0 (no impact) to 3 (maximum impact), yielding a total score ranging from 0 to 30, with higher scores indicating greater impairment in quality of life. Ethical clearence obtained from institutional ethics committee.

The interpretation of the CDLQI assessment includes:

Table 1: CDLQI Interpretation

CDLQI	Interpretation
0-1	No impact on QoL
2-5	Small impact on QoL
6-10	Moderate impact on QoL
11-20	Very large impact on QoL
21-31	Extremely large impact on QoL

Statistical analysis: The data obtained were analysed statistically using SPSS version 23. Correlation between variables was calculated using Chi-square test. P-value < 0.05 was considered statistically significant.

Results

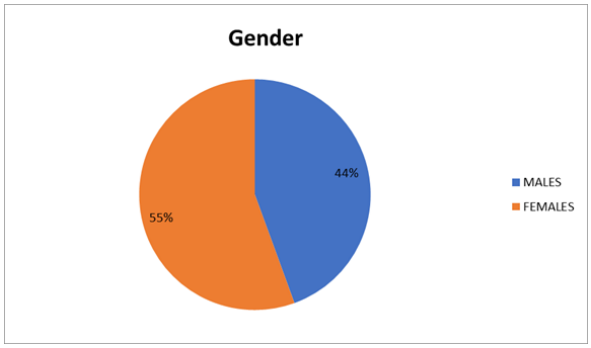
A total of 50 children with vitiligo were included in the study, comprising 28 girls and 22 boys. The clinical and demographic characteristics of the participants are summarized in Table 2. The mean age was 11.06 ± 3.1years, with a range of 6 to 16 years. A positive family history of vitiligo was reported in 20% of the cases, while 80% had no such history. The mean duration of vitiligo was 2.0 ± 1.77 years, with 52% of the children having a disease duration of less than one year. The most common clinical form was vitiligo vulgaris (52%), followed by focal vitiligo (20%), acrofacial vitiligo (10%), acral vitiligo (6%), mucosal vitiligo (6%), and segmental vitiligo (4%). The mean Vitiligo Disease Activity (VIDA) score was 2.96 ± 1.43, with 56% of patients showing a VIDA score of 4 or higher, indicating active disease. The mean Vitiligo Area Scoring Index (VASI) score was21.9 ± 18.0, with the majority (56%) scoring between 1 and 25. The mean score on the Childhood Dermatology Life Quality Index (CDLQI) was 8.05 ± 6.77. As shown in Table 3, vitiligo had a small impact on the quality of life in 34% of patients, a moderate impact in 26%, no impact in 18%, a very large impact in 14%, and an extremely large impact in 8%.

Table 2: Clinical and demographic characteristics of the participants

Characteristics	Frequency (n)	Percentage (%)	MEAN and SD
Age			
6-8	13	26%	11.03 ±3.13 years
9-11	15	30%	
12-14	11	22%	
15-16	11	22%	
Sex			
Males	22	44%	
Females	28	56%	
Family history			

Positive	10	20%	
Negative	40	80%	
Duration of disease(years)			
<1	26	52%	
2-4	19	38%	2.0 ±1.77 years
5-7	5	10%	
Type of vitiligo			
Vitiligo vulgaris	26	52%	
Acro facial vitiligo	5	10%	
Acral vitiligo	3	6%	
Focal vitiligo	10	20%	
Segmental vitiligo	2	4%	
Mucosal vitiligo	3	6%	
VIDA score			
4+	28	56%	
3+	9	18%	2.96 ± 1.43
2+	1	2%	
1+	7	14%	
0	5	10%	
1-	0	0%	
VASI SCORE			
1-25	28	56%	
26-50	22	44%	24 ± 12.41
Quality of life score			
0 – 1	9	18%	
2 – 6	17	34%	8.05 ± 6.77
7 -12	13	26%	
13 – 18	7	14%	
19-30	4	8%	

Graph 1: Gender distribution



Graph 2: clinical types of vitiligo

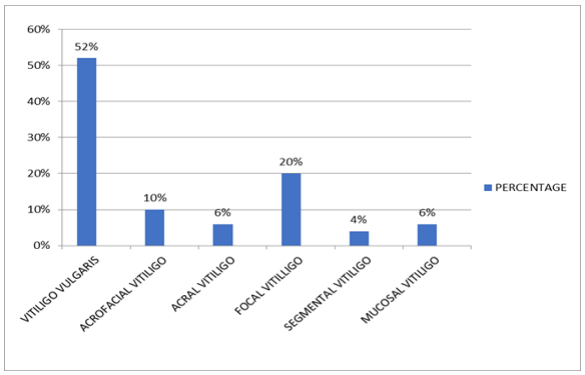


Figure 1: Focal vitiligo

Figure 2: Segmental vitiligo

Figure 3: Acral vitiligo

Figure 3A:

Figure 3B:

Figure 4: Acro facial vitiligo

Figure 4A:

Figure 4B:

Figure 5: Vitiligo vulgaris

Figure 5A:

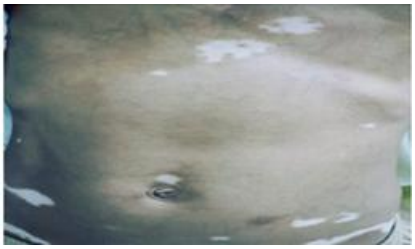
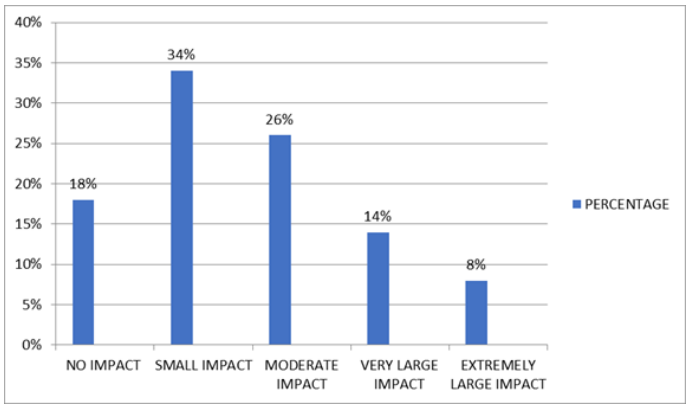


Figure 5B:

Table 3: Distribution of patients based on Quality of life

Quality of life	Frequency	Percentage (%)
No impact	9	18%
Small impact	17	34%
Moderate impact	13	26%
Very large impact	7	14%
Extremely large impact	4	8%
Total	50	100%

Graph 3: Distribution of patients based on Quality of life



As shown in Table 4 There is a statistically significant association between sex and quality of life, indicating that gender influences the degree of life impact. A strong association is also found between the duration of disease and quality of life impairment, with longer disease duration linked to greater negative effects. Additionally, the type of vitiligo significantly affects quality of life. Both the VIDA score (disease activity) and the VASI score (extent of skin involvement) show statistically significant correlations with quality of life suggesting that increased disease activity and larger affected areas are associated with greater negative impacts. Conversely, age and family history do not show statistically significant associations with quality of life, indicating these factors do not substantially influence the level of quality of life impact.

Table 4: corelation of quality of life with age, sex, family history, types of vitiligo, duration of disease , VIDA Score, VASI Score.

Characteristics	quality of life										
	No impact		Small impact		Moderate impact		Very large impact		Extremely large impact		P value
Age	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
6-8	3	6%	6	12%	3	6%	1	2%	0	0%	
9-11	3	6%	4	8%	6	12%	2	4%	0	0%	
12-14	0	0	4	8%	2	4%	3	6%	2	4%	
15-16	3	6%	3	6%	2	4%	1	2%	2	4%	
Sex											**0.0251**
Males	5	10%	9	18%	2	4%	2	4%	4	8%	

Females	4	8%	8	16%	11	22%	5	10%	0	0%	
Family history											
present	2	4%	6	12%	2	4%	0	0%	0	0%	
Absent	7	14%	11	22%	11	22%	7	14%	4	8%	**0.2454**
Duration of disease(years)											
<1	4	8%	10	20%	7	14%	5	10%	0	0%	
2-4	5	10%	6	12%	6	12%	2	4%	0	0%	**0.001**
5-7	0	0%	1	2%	0	0%	0	0%	4	8%	
Type of vitiligo											
Vitiligo vulgaris	0	0%	8	16%	7	14%	7	14%	4	8%	
Acro facial vitiligo	0	0%	3	6%	2	4%	0	0%	0	0%	
Acral vitiligo	0	0%	2	4%	1	2%	0	0%	0	0%	
Focal vitiligo	4	8%	4	8%	2	4%	0	0%	0	0%	**0.0068**
Segmental vitiligo	2	4%	0	0%	0	0%	0	0%	0	0%	
Mucosal vitiligo	3	6%	0	0%	1	2%	0	0%	0	0%	
VIDA Score											
4+	5	10%	8	16%	8	16%	5	10%	2	4%	
3+	0	0%	5	10%	2	4%	1	2%	1	2%	**0.0068**
2+	1	2%	0	0%	0	0%	0	0%	0	0%	
1+	2	4%	3	6%	1	2%	0	0%	1	2%	
0	1	2%	1	2%	2	4%	1	2%	0	0%	
1-	0	0%	0	0%	0	0%	0	0%	0	0%	
VASI SCORE											
1-25	9	18%	10	20%	7	14%	0	0%	2	4%	
26-50	0	0%	7	14%	6	12%	7	14%	2	4%	**0.0028**

Discussion

In the present study, the mean age of children diagnosed with vitiligo was 11.06 ± 3.1yearsyears, with an age range of 6 to 16 years. This finding is comparable to that of Maryam Khalili et al.,[19] who reported a mean age of 10.3 ± 3.39 years among children aged 4 to 16 years. However, Andrade G et al.[21] documented a lower mean age at diagnosis, 6.1 years, with a broader age range of 1 to 15 years.

A total of 50 patients were enrolled in the current study, including 28 girls and 22 boys. This gender distribution is similar to that observed in the study by Maryam Khalili et

al.,[19] who included 61 children, comprising 37 girls and 24 boys.

The mean duration of vitiligo in the present study was 2.0 ± 1.77 years, with 52% of children experiencing the condition for less than one year. In contrast, Maryam Khalili et al.[19] reported a longer average disease duration of 3.44 years, with most cases (62.3%) falling within a 1–5 year duration range.

Vitiligo vulgaris was identified as the most prevalent clinical subtype in the current study, accounting for 52% of cases. This aligns with the findings of Maryam Khalili et al.,[19] who also reported vitiligo vulgaris as the dominant form in 62.3% of their pediatric patients.

Regarding quality of life, the mean CDLQI score observed in this study was 8.05 ± 6.77. Vitiligo had a small impact on the quality of life in 34% of patients, a moderate impact in 26%, no impact in 18%, a very large impact in 14%, and an extremely large impact in 8%. Comparatively, Maryam Khalili et al.[19] recorded a lower mean CDLQI score of 3.6 ± 4.2, with the majority of children (42.6%) reporting no impact on quality of life. In their cohort, mild, moderate, and severe impacts were noted in 37.7%, 14.8%, and 4.9% of participants, respectively. In contrast, Dertlioglu et al.[20] reported a higher mean CDLQI score of 11.68 ± 6.54, indicating a greater overall impact on life quality among children in their study.

In terms of disease severity, the mean Vitiligo Area Scoring Index (VASI) score in the current study was was21.9 ± 18. This is considerably higher than the findings of Awal G et al.,[22] who reported a mean VASI score of 12.63 ± 8.06 in their study population.

Assessment of disease activity using the Vitiligo Disease Activity (VIDA) score revealed that the majority of patients (56%) in the present study had a VIDA score of 4+, followed by 18% with 3+, 14% with 1+, 10% with a score of 0, and 2% with 2+. In comparison, Awal G et al..[22] found the most common VIDA score to be +2 (27.17%), followed by +3 (24.61%) and 0 (15.38%).

In the present study, no significant correlation was found between age and quality of life (QoL) in patients with vitiligo. This finding is consistent with the results of Phinari et al. [23], who also reported no significant relationship between age and QoL in vitiligo patients ($p > 0.05$). Similarly, Al-Shammari et al.[24] (2021) observed no significant association between age and QoL in individuals with vitiligo. In contrast, a study by Maryam Khalili et al .[19] found a significant relationship between patients' age and their quality of life.

In the current study, a statistically significant association was observed between sex and quality of life (QoL). However, this contrasts with the findings of Phinari et al.[23], who reported no significant correlation between gender and QoL ($p > 0.05$). Similarly, studies by Al-Dabbagh (2019) and Silpa-Archa et al.[25] (2020) also concluded that gender does not significantly influence QoL in vitiligo patients. Likewise, Maryam Khalili et al.[19] found no significant relationship between patients' sex and their quality of life.

In the present study, family history do not show statistically significant association with quality of life.

In the present study, a significant association was observed between the duration of the disease and the level of quality of life impairment. In contrast, Andrade G et al. reported no significant correlation between the duration of the disease and overall parental quality of life

In the current study, the type of vitiligo was found to have a significant impact on quality of life. This is consistent with the findings of Maryam Khalili et al.[19], who also reported a significant association between the

type of vitiligo and patients' quality of life.

In this study, the VIDA score showed a significant statistical relationship with quality of life. Similarly Awal G et al.[22] identified a statistically significant relationship between the VIDA scores and with quality of life.

In this study, the VASI score—indicating the extent of skin involvement—was found to have a statistically significant correlation with quality of life. Similarly, Awal G et al.[22]reported a significant association between the VASI score and both quality of life measures.

Conclusion

This study provides valuable insights into the clinical and psychosocial dimensions of vitiligo in the pediatric population. Vitiligo in children significantly impacts quality of life, with over half of the participants experiencing moderate to severe psychosocial effects. The findings demonstrate that disease-related factors—such as sex, type of vitiligo, duration of illness, disease activity (VIDA score), and extent of skin involvement (VASI score)—are significantly associated with quality of life impairment. In contrast, age and family history do not show a statistically significant influence. These results underscore the need for comprehensive care strategies that address both the physical and emotional aspects of vitiligo in children.

Limitations

Single-center study: This study was conducted at a single tertiary care center in Andhra Pradesh, which may limit the generalizability of the findings to broader populations across different regions and cultural backgrounds.

Cross-sectional design: The cross-sectional nature of the study limits the ability to establish causal relationships between clinical variables and quality of life outcomes. Longitudinal studies would be required to assess the progression and psychosocial impact of vitiligo over time.

Relatively small sample size: The study included only 50 participants, which may reduce the statistical power and limit subgroup analyses (e.g., by specific vitiligo types or severity).

Use of self-reported questionnaire: The CDLQI relies on self-reporting (or proxy responses by parents), which could introduce recall bias or social desirability bias, particularly in younger children who may have difficulty articulating psychosocial challenges.

Exclusion of children with comorbid conditions: Patients with other dermatologic or systemic conditions were excluded, which might underestimate the real-life impact of vitiligo in children who often have comorbidities.

Abbreviations

CDLQI - Childhood Dermatology Life Quality Index

VASI score – Vitiligo area scoring index

VIDA score – Vitiligo disease activity

QoL – Quality of life

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