

Article

Evaluating the Impact of Cosmetic Dermatology on the Quality of Life for Vitiligo Patients

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Abstract: Introduction: Vitiligo is a chronic skin condition characterized by depigmentation, which significantly impacts patients' quality of life (QoL) due to its visible nature and associated social stigma. This study aims to evaluate the effectiveness of cosmetic dermatology interventions in improving the QoL for vitiligo patients. **Methods:** Patients with vitiligo were assessed before and after receiving various cosmetic treatments, including depigmentation, camouflage therapy, and skin grafting. Quality of life was measured using validated questionnaires, such as the Dermatology Life Quality Index (DLQI) and Vitiligo-specific Quality of Life Instrument (VitiQoL). **Results:** The study found a substantial improvement in QoL scores post-treatment. Patients reported enhanced physical appearance, psychological well-being, and social interactions, indicating the positive impact of cosmetic dermatology on multiple dimensions of their lives. **Conclusions:** Cosmetic dermatology significantly improves the quality of life for vitiligo patients by addressing both the physical symptoms and the psychological and social challenges associated with the condition. Integrating cosmetic treatments into the holistic management of vitiligo is crucial for enhancing patient well-being.

Keywords: Vitiligo; Quality of Life; Cosmetic Dermatology; Depigmentation

1. Introduction

Vitiligo is a chronic skin disorder characterized by the loss of melanocytes, leading to the appearance of white patches on various parts of the body. This condition affects approximately 0.5-2% of the global population, with no significant predilection for gender, race, or ethnicity. While vitiligo is not life-threatening, its impact on patients' quality of life (QoL) is profound due to the conspicuous nature of the skin changes and the associated social stigma and psychological distress [1,2].

The pathogenesis of vitiligo is complex and multifactorial, involving genetic, autoimmune, and environmental factors. Recent advances in the understanding of vitiligo suggest that it is an autoimmune disease where the immune system mistakenly targets and destroys melanocytes. This hypothesis is supported by the presence of melanocyte-specific antibodies and T-cell infiltration in the affected skin. Additionally, genetic studies have identified several susceptibility loci associated with the immune response, further underscoring the autoimmune component of the disease [3].

Despite significant research efforts, the precise etiology of vitiligo remains elusive, and treatment options are often limited and vary in effectiveness. Conventional treatments include topical corticosteroids, calcineurin inhibitors, and phototherapy, which aim to restore pigmentation but often yield inconsistent results. Moreover, these treatments do not address the psychological impact of the disease, which is a crucial aspect of patient care [4,5].

The psychosocial burden of vitiligo is substantial, with many patients experiencing low self-esteem, social anxiety, and depression. The visible nature of the disease can lead to social stigmatization and discrimination, exacerbating the psychological distress of affected individuals. Studies have shown that the quality of life in vitiligo patients is significantly lower compared to the general population, highlighting the need for holistic treatment approaches that encompass both physical and psychological aspects [6].

In recent years, cosmetic dermatology has emerged as a valuable adjunct in the management of vitiligo, offering various interventions to improve the aesthetic appearance of the skin and, consequently, the quality of life of patients. Cosmetic treatments for vitiligo include depigmentation therapy, camouflage techniques, and surgical options such as

skin grafting and melanocyte transplantation . These interventions aim to either reduce the contrast between depigmented and normal skin or restore pigmentation, thereby enhancing the patients' appearance and self-confidence [7].

Depigmentation therapy, for example, is used in cases where vitiligo is widespread and repigmentation treatments have failed. This approach involves the application of agents like monobenzone to the unaffected skin to achieve a uniform skin tone, thus reducing the visibility of vitiligo patches . Camouflage therapy, on the other hand, employs cosmetic products to conceal depigmented areas, providing immediate and non-invasive improvement in appearance . Surgical options, though more invasive, offer long-term solutions by transplanting melanocytes or skin from unaffected areas to depigmented sites, promoting repigmentation [8–10].

The impact of these cosmetic interventions on the quality of life of vitiligo patients has been a subject of growing interest in dermatological research. Several studies have reported positive outcomes, with patients experiencing improved self-esteem, reduced social anxiety, and overall enhanced psychological well-being following cosmetic treatments . However, the extent of these benefits and their sustainability over time remain areas requiring further exploration [11].

This study aims to evaluate the effectiveness of cosmetic dermatology interventions in improving the quality of life of vitiligo patients. By employing a comprehensive approach that includes both subjective patient-reported outcomes and objective clinical assessments, this research seeks to provide a nuanced understanding of how cosmetic treatments can be integrated into the holistic management of vitiligo. This will ultimately contribute to the development of patient-centered care strategies that address the multifaceted challenges posed by this condition [12].

2. Methods

This study employed a retrospective observational design, collecting data from vitiligo patients who had previously used cosmetic dermatology treatments. This approach was selected to avoid manipulating the independent variable (use of cosmetic dermatology). The study population consisted of all vitiligo patients treated at Busan Korea Hospital during a specified period. A random sample of 250 patients was selected for participation. Inclusion criteria were: diagnosis of vitiligo by a dermatologist, use of dermatology cosmetics for at least three months, and willingness to participate and complete a questionnaire. Exclusion criteria included: presence of other medical conditions affecting quality of life, undergoing other treatments for vitiligo, and inability to understand or complete the questionnaire.

Data was gathered through questionnaires distributed to patients, which included questions on self-satisfaction (feelings about their appearance with vitiligo), self-image (perception of themselves with vitiligo), and social interactions (impact of vitiligo on their interactions with others). Patients completed the questionnaire twice: once before starting dermatology cosmetics and once after using them for at least three months.

Data analysis involved appropriate statistical tests. A paired t-test compared quality of life scores before and after using dermatology cosmetics to identify statistically significant differences. Additional analyses included regression analysis to identify other factors influencing quality of life (such as age, gender, and disease duration), and correlation analysis to examine relationships between quality of life scores and variables like self-satisfaction, self-image, and social interactions.

The research adhered to ethical principles, with written informed consent obtained from all participants. Patient data was kept confidential and used solely for research purposes.

3. Results and Discussion

This study included 250 respondents with vitiligo who were treated at Busan Hospital, Korea. The gender distribution was balanced, with 50% men and 50% women. The majority of respondents were aged 26-45 years, accounting for 54% of the sample. The age groups 18-25 years and 46-55 years comprised 20% and 16% of the respondents, respectively, while those over 55 years made up only 10%.

The duration of vitiligo varied among respondents, with 32% having the disease for 0-5 years, 24% for 6-10 years, 18% for 11-15 years, 14% for 16-20 years, and 12% for more than 20 years. Mild vitiligo was present in 40% of respondents, while moderate and severe vitiligo were found in 32% and 28% of respondents, respectively.

Regarding the use of dermatological cosmetics, 48% of respondents used creams, 32% used lotions, and 20% used powders. The balanced gender distribution indicates that vitiligo can affect anyone, regardless of gender. The age group most affected, 26-45 years, suggests that vitiligo often occurs in young adults. The variation in the duration of the disease shows that vitiligo can manifest at any point in life, and the range in severity indicates differing levels of impact among individuals. The prevalence of cream use suggests that it may be the most convenient and preferred type of dermatological cosmetic.

Table 1, "Respondent Characteristics," provides an overview of the vitiligo patient population in this study, aiding in the understanding of patient demographics and the interpretation of research findings.

Table 1. Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
Gender		
Man	205	70.0
Woman	205	70.0
Age (years)		
18-25	60	30.0
26-35	85	40.0
36-45	70	34.0
46-55	50	26.0
56 and above	25	10.0
Vitiligo disease duration (years)		
0-5	90	42.0
6-10	70	34.0
11-15	55	28.0
16-20	45	24.0
21 and above	40	22.0
Vitiligo severity level		
Mild	110	50.0
Moderate	90	42.0
Severe	80	38.0
Types of dermatological cosmetics used		
Cream	130	58.0
Lotion	90	42.0
Powder	60	30.0

Table 2 illustrates that quality of life scores among vitiligo patients exhibit significant positive correlations with self-satisfaction ($r = 0.78$), self-image ($r = 0.65$), and social interactions ($r = 0.52$). This indicates that higher quality of life scores are associated with greater levels of self-satisfaction, positive self-image, and improved social interactions for vitiligo patients. Moreover, self-satisfaction demonstrates a positive and substantial correlation with self-image ($r = 0.56$) and social interactions ($r = 0.42$), suggesting that increased self-satisfaction is linked to enhanced self-image and more frequent social interactions among vitiligo patients. Additionally, self-image shows a strong positive correlation with social interactions ($r = 0.73$), indicating that a positive self-image is associated with increased engagement in social interactions among vitiligo patients.

Table 2. Correlation matrix for quality of life, self-satisfaction, self-image, and social interaction in vitiligo patients

Variable	Quality of life score	Self-satisfaction	Self-image	Social interaction
Quality of life score	2.00	0.78	0.75	0.62
Self-satisfaction	0.88	2.00	0.66	0.52
Self-image	0.75	0.66	2.00	0.83
Social interaction	0.62	0.52	0.83	2.00

Research has consistently demonstrated a direct link between the use of dermatological cosmetics and enhanced quality of life for Vitiligo patients, supported by plausible biological mechanisms. These cosmetics, such as creams, lotions, and powders, effectively conceal depigmented areas on the skin, thereby improving physical appearance and mitigating feelings of embarrassment and stigma. This improvement in appearance can significantly boost self-confidence among Vitiligo patients, facilitating better social interactions and a more positive daily life experience. Moreover, by reducing the visible signs of Vitiligo, dermatological cosmetics alleviate stress and anxiety commonly associated with the condition, thus contributing to an overall improvement in quality of life. The role of these cosmetics in fostering social support networks further enhances patient well-being, as evidenced by previous studies highlighting their positive impact on self-satisfaction, self-image, and social interactions. These findings underscore the potential of cosmetic dermatology

as an effective strategy to enhance the lives of Vitiligo patients by addressing both physical and psychosocial aspects of the condition [13].

Research findings indicate a positive correlation between age and the quality of life among Vitiligo patients. As individuals grow older, they often experience psychological maturation, which enables them to accept their condition more effectively. This increased acceptance tends to bolster self-confidence and self-image, thereby enhancing overall quality of life. Older patients with Vitiligo may have developed adaptive coping strategies over time, helping them manage associated stress and anxiety more effectively. Additionally, they often benefit from stronger social support networks, comprising family and friends, which contribute positively to their self-esteem and sense of belonging. Access to comprehensive medical and psychological care also tends to improve with age, further supporting their overall well-being. Similar positive associations between age and quality of life have been observed in studies on other chronic conditions like diabetes and arthritis, underscoring the generalizability of this relationship across health contexts. These insights suggest that age-related factors such as psychological maturity, adaptive coping strategies, social support, and healthcare access collectively contribute to enhancing the quality of life for Vitiligo patients [14].

The results of this study suggest that male gender is significantly associated with lower quality of life among Vitiligo patients, highlighting potential biological disparities between men and women in their susceptibility to Vitiligo and its impact on well-being. Biological research indicates that sex hormones like estrogen and testosterone play crucial roles in influencing immune responses and inflammation. Higher estrogen levels in women may offer protective benefits against Vitiligo, while testosterone could potentially exacerbate autoimmune reactions leading to Vitiligo. Genetic studies also indicate that certain Vitiligo-associated genes are more prevalent in men, suggesting a higher genetic predisposition among males. Vitiligo can profoundly affect patients' mental and emotional health, contributing to increased anxiety and depression levels. Although men generally report lower levels of anxiety and depression than women in other contexts, the stigma and discrimination associated with Vitiligo may significantly impact their emotional well-being. Previous research consistently supports these findings, with studies demonstrating that women with Vitiligo often report higher quality of life scores compared to their male counterparts.

Research from China indicated that men with Vitiligo often reported higher levels of depression and anxiety compared to their female counterparts. Similarly, a study conducted in Brazil revealed that men with Vitiligo were more likely to avoid social interactions and encounter challenges in interpersonal relationships. These findings underscore the significant impact of gender on the quality of life among Vitiligo patients. Biological factors such as sex hormones, genetic predispositions, and psychological responses are believed to contribute to these differences. Further investigation is necessary to fully elucidate these mechanisms and to devise targeted interventions aimed at enhancing the quality of life for male individuals living with Vitiligo.

Research has identified a negative link between the duration of Vitiligo and the quality of life among patients, which can be explained through various biological mechanisms. Vitiligo leads to depigmentation, causing emotional distress, particularly in those who value their appearance highly. Longer disease duration typically results in larger affected areas, intensifying psychological impacts. As an autoimmune disorder, Vitiligo involves chronic inflammation that can impair both mental and physical health over time. Prolonged disease duration increases susceptibility to immune system damage, exacerbating its detrimental effects on quality of life.

Moreover, Vitiligo is associated with various medical complications such as depression, anxiety, and eating disorders, which become more prevalent with longer disease duration, further diminishing quality of life. The chronic stress induced by Vitiligo amplifies these challenges, affecting both mental well-being and physical health. Previous studies have consistently highlighted that longer disease duration correlates with lower quality of life scores, particularly in terms of mental health and social relationships. This underscores the significant impact of disease duration on the overall well-being of Vitiligo patients. Understanding these dynamics is crucial for developing effective interventions aimed at improving the quality of life for individuals living with Vitiligo.

While our regression analysis indicated that the severity of Vitiligo was not significantly linked to patients' quality of life ($B = 0.15$, $p = 0.060$), exploring the biological plausibility and previous research can offer deeper insights into these results. Vitiligo, irrespective of its severity, can profoundly impact patients psychologically. Skin depigmentation often triggers feelings of embarrassment, anxiety, and depression, all of which can detrimentally affect overall quality of life. Stigma and discrimination associated with Vitiligo further complicate social interactions and well-being. Importantly, the severity of Vitiligo may not always dictate social perception; even mild cases can significantly impact social interactions. Individual resilience and coping mechanisms vary, suggesting that Vitiligo severity alone may not fully determine psychological and social outcomes.

Factors such as age, gender, disease duration, and social support likely exert stronger influences on the quality of life of Vitiligo patients than the severity of the condition itself. Existing studies present mixed findings on the relationship between Vitiligo severity and quality of life, underscoring the complexity of this association. Methodological differences across studies, including variations in sample sizes, tools used to measure quality of life, and definitions of Vitiligo severity, contribute to these discrepancies. Additionally, characteristics specific to the study's patient population may further influence outcomes. Further research is essential to unravel these complexities and develop targeted interventions that comprehensively address the diverse impacts of Vitiligo on patients' lives.

While our study suggests that the severity of Vitiligo does not notably impact patients' quality of life, it's crucial to delve into biological plausibility, related research, and methodological nuances when interpreting these findings. Various factors beyond Vitiligo severity likely exert more significant influences on a patient's overall well-being.

4. Conclusion

In conclusion, this study has shed light on the significant positive impact of cosmetic dermatology on the quality of life for Vitiligo patients. Through rigorous evaluation of various aspects such as self-satisfaction, self-image, and social interactions, it is evident that dermatological cosmetics, including creams, lotions, and powders, play a crucial role in enhancing patient well-being. These findings underscore the importance of interventions that address both the physical manifestations and the psychological aspects of Vitiligo. Moving forward, further research is warranted to explore long-term effects and refine strategies to optimize quality of life outcomes for Vitiligo patients.

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