





The Relationship Between Body Dysmorphic Disorder and Depressive Symptoms with Health-Related Quality of Life in Women with Vitiligo

Melika Noori ^{1,*}, Reza Johari Fard ¹

¹ Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

*Corresponding Author: Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran. Email: noorimelika@gmail.com

Received: 8 May, 2024; Revised: 24 June, 2024; Accepted: 26 August, 2024

Abstract

Background: Vitiligo is a common skin disorder characterized by the loss of skin pigment, which can significantly impact individuals' health-related quality of life (HRQoL), particularly in women. Body dysmorphic disorder (BDD) and depressive symptoms are common psychological comorbidities associated with vitiligo.

Objectives: This study aimed to investigate the relationship between BDD, depressive symptoms, and HRQoL in women with vitiligo.

Methods: A cross-sectional study was conducted in Ahvaz, Iran, in 2023, involving a sample of 152 women with vitiligo. The study population included all women with vitiligo who presented to dermatology or cosmetic clinics in Ahvaz during that year. Data were collected using the MOS 36-item Short-Form Health Survey (SF-36), the Multidimensional Body-Self Relations Questionnaire (MBSRQ), and the Beck Depression Inventory (BDI). Pearson's correlation and regression analyses were used to assess the relationships between variables. Data analysis was conducted using SPSS-27 software.

Results: Women with vitiligo had a mean health-related quality of life score of (58.13 ± 11.50). Their mean score on the body dysmorphic disorder assessment was (99.61 ± 37.33), and the mean depressive symptom score was (20.25 ± 4.47). Significant negative correlations were found between BDD and HRQoL, as well as between depressive symptoms and HRQoL, in women with vitiligo ($P < 0.001$). Multiple regression analysis showed that BDD and depressive symptoms independently predicted HRQoL ($P < 0.001$).

Conclusions: Body dysmorphic disorder and depressive symptoms are significantly associated with impaired HRQoL in women with vitiligo. Screening for and treating BDD and depressive symptoms may improve HRQoL in this population.

Keywords: Vitiligo, Body Dysmorphic Disorder, Depressive Symptoms, Health-related Quality of Life

1. Background

The skin serves as a vital defense mechanism against the invasion of microorganisms, chemicals, and other environmental hazards (1, 2). Disruptions to this barrier, manifesting as various skin diseases, can lead to infections and other health complications (3). Moreover, skin conditions can significantly affect individuals' quality of life, impacting both their physical and psychological well-being (4). Vitiligo is one such autoimmune skin disease, characterized by the loss of pigment-producing cells (melanocytes) in specific areas of the skin, resulting in visible white patches (5). It is estimated to affect 0.5 - 1% of the global population, with no racial or ethnic predilection (6). While several types

of vitiligo exist, the most common forms are segmental vitiligo (affecting one side or a limited area of the body) and generalized vitiligo (affecting multiple areas of the body) (7).

Among skin diseases, pigmentary disorders are particularly significant, and vitiligo is considered one of the most common of these disorders (8). Vitiligo involves the destruction of pigment-producing cells in the skin and hair for unknown reasons, leading to a failure to produce pigment and resulting in white patches due to the loss of skin pigmentation (9, 10). The diagnosis of vitiligo can have a profound impact on an individual's health-related quality of life (HRQoL) (11).

The World Health Organization (WHO) defines HRQoL as an individual's perception of their position in

life within the context of their culture and value system, and in relation to their goals, expectations, standards, and concerns (12). This definition of HRQoL encompasses three components: Subjective well-being, functional status, and contextual factors, with the first two components overlapping with mental health quality of life (13). health-related quality of life can be used as a predictor of the severity and impact of diseases, injuries, and disabilities, as well as a measure to assess mental health in populations (14, 15).

Body dysmorphic disorder (BDD) is another factor that significantly impacts the HRQoL of individuals with vitiligo (16). Body image transcends personal identity; it acts as a cornerstone of social identity, shaping how we interact with the world and how others perceive us (17). Dissatisfaction with one's body image, particularly in a condition like vitiligo with visible skin changes, can lead to a significant decline in both mental health and HRQoL (18). Our perception of our body is a complex interplay between physical characteristics and psychological interpretation, which profoundly influences our ability to connect with others (19). A negative body image can lead to social anxiety and a distorted perception of how others view us, potentially fostering social isolation and reducing the quality of social interactions. This can have a cascading effect, impacting self-worth and confidence in social situations. Yarmohammadi et al. (20) support this notion by demonstrating a positive correlation between body image and HRQoL in their research. Conversely, they found an inverse relationship between obsessive beliefs, often a core feature of BDD, and HRQoL.

Depression is another significant factor negatively impacting the HRQoL of women with vitiligo (21, 22). While depression can be a natural response to various life stressors (23), it often goes beyond this simplistic explanation. Extensive research demonstrates a strong and complex association between depression and vitiligo (24, 25). Women with vitiligo experience depressive symptoms at a considerably higher rate compared to the general population (26). This increased vulnerability to depression can be attributed to several factors related to the presence of vitiligo. Social stigma and discrimination due to the visible nature of vitiligo can be a major source of stress, contributing to feelings of isolation and alienation (27). Body image disturbance, a common consequence of vitiligo, often leads to dissatisfaction and potentially decreased self-esteem. This negative self-perception can create a cycle of anxiety and depression, further impacting HRQoL. Additionally, the chronic nature of vitiligo and the

psychological stress of managing the condition can contribute to depressive symptoms (28).

While vitiligo primarily manifests as visible skin discoloration, its impact extends far beyond the physical. Many patients with dermatological conditions, including vitiligo, experience symptoms related to distorted body image or psychological distress, such as non-organic itchiness, pain, and burning sensations. These psychogenic symptoms non-organic sensory experiences, BDD, depression, and anxiety can significantly impact patients' quality of life, causing distress, hindering daily functioning, and increasing healthcare resource utilization. Despite the recognized association between psychological factors and vitiligo, research specifically exploring the link between BDD, depression, and HRQoL in women with vitiligo remains limited. Addressing this gap is crucial for improving the overall well-being of women with vitiligo.

2. Objectives

Based on this background, the present study aimed to investigate the relationship between BDD, depressive symptoms, and HRQoL in women with vitiligo.

3. Methods

3.1. Study Design and Participants

The present study was a descriptive correlational investigation. The statistical population consisted of all women with vitiligo who visited dermatology and cosmetic clinics in Ahvaz, Iran, in 2023. To ensure adequate statistical power and generalizability of the findings, a minimum sample size per predictor variable was recommended (29). Considering the number of independent variables in this study, the potential for participant attrition, and the desire for statistically robust results, a sample size of 150 participants was deemed necessary. Using a convenience sampling method, 165 female patients with vitiligo were selected.

Inclusion criteria included a diagnosis of vitiligo by a dermatologist, willingness to participate in the study and provide informed consent, and no history of psychotherapy. Exclusion criteria included unwillingness to continue participation and incomplete questionnaires. Ultimately, after excluding incomplete questionnaires, data from 152 participants were analyzed.

To ensure ethical compliance, participant confidentiality and anonymity were strictly maintained. All data collection and analysis procedures were anonymized, and no personally identifiable

information was collected. The results are reported solely in aggregate form to protect individual privacy and prevent any potential disclosure that could violate personal boundaries.

3.2. Data Collection

3.2.1. The MOS 36-item Short-Form Health Survey (SF-36)

The SF-36 was developed by Ware (30) and consists of 36 items divided into 8 components: Physical functioning, role limitations due to physical health problems, role limitations due to emotional problems, energy and fatigue, emotional well-being, social functioning, pain, and general health. Scores on this questionnaire range from 0 to 100, with lower scores indicating poorer quality of life. Scores are classified into four levels: Less than 45 indicates very poor quality of life, 45 - 60 indicates poor quality, 60 - 75 indicates good quality, and above 75 indicates desirable quality. Brazier et al. (31) reported a total test reliability of 0.85. In the current study, Cronbach's alpha was used to determine the reliability of the SF-36, yielding a value of 0.84.

3.2.2. The Multidimensional Body-Self Relations Questionnaire (MBSRQ)

The MBSRQ was developed by Cash (32) and consists of 46 items rated on a 5-point scale, ranging from very dissatisfied (1) to very satisfied (5). This questionnaire assesses appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, mental weight, and satisfaction with body areas. The Persian version of the MBSRQ demonstrated high internal consistency, with a Cronbach's alpha coefficient of 0.98 (33). In the current study, Cronbach's alpha was used to evaluate the reliability of the MBSRQ, yielding a value of 0.81.

3.2.3. The Beck Depression Inventory (BDI)

The BDI is a widely used 21-item self-report questionnaire developed by Beck (34) to assess the severity of depressive symptoms. It is one of the most common psychometric tools for measuring depression. Each item on the BDI is rated on a 4-point Likert scale from 0 to 3, with total scores ranging from 0 to 63. Higher scores indicate more severe depressive symptoms. Farzadkia et al. (35) established the internal consistency of the questionnaire using Cronbach's alpha, yielding a coefficient of 0.87. In the present study, the Cronbach's alpha coefficient for the BDI was 0.88, indicating good internal consistency.

3.3. Data Analysis

The data collected in this study were analyzed using SPSS-27 software. Descriptive statistics, including means and standard deviations, were used to summarize the data. Pearson's correlation coefficient and stepwise regression analysis were employed for inferential statistical analysis.

4. Results

The sample consisted of women with vitiligo. In terms of educational attainment, 58 participants (38.16%) reported having a university education, while 94 participants (61.84%) had a high school education. Regarding age distribution, the majority (69.08%) were between 20 and 35 years old, with the remaining 30.92% between 35 and 50 years old. Employment status revealed that 59.87% (n = 91) of the participants were housewives, while 40.13% (n = 61) were employed. Marital status distribution showed that 54.61% (n = 83) of the participants were single, while 45.39% (n = 69) were married. Table 1 presents the mean and standard deviation (SD) of the research variables.

Table 2 presents the correlation coefficients between the study variables. Significant negative correlations were observed between BDD symptoms and HRQoL ($r = -0.41, P < 0.001$), as well as between depressive symptoms and HRQoL ($r = -0.37, P < 0.001$) in women with vitiligo. These findings indicate that higher levels of BDD symptoms and depressive symptoms are associated with lower HRQoL scores.

Body dysmorphic disorder was the strongest predictor of HRQoL in the first model. The correlation coefficient between BDD and HRQoL was -0.38, accounting for 24% of the variance in health-related quality of life in women with vitiligo. Depressive symptoms were added in the second model, and the combined correlation coefficient of these two variables with HRQoL was -0.32, accounting for 36% of the variance in HRQoL in women with vitiligo (Table 3).

5. Discussion

The present study aimed to investigate the relationship between BDD, depression, and HRQoL in women with vitiligo. The findings indicated multiple relationships between these variables. The first finding was that HRQoL could be predicted based on BDD in women with vitiligo. This result aligns with the studies by Barberis et al. (36) and Chee et al. (37).

This can be explained by the fact that BDD refers to a negative perception of one's body shape and size, which

Table 1. Mean and Standard Deviation of the Research Variables

Variables	Mean \pm SD
Health-related quality of life	58.13 \pm 11.50
Body dysmorphic disorder	99.61 \pm 37.33
Depressive symptoms	20.25 \pm 4.47

Table 2. Pearson Correlation Coefficients of the Research Variables

Variables	Health-Related Quality of Life	
	r	P
Body dysmorphic disorder	-0.41	0.001
Depressive symptoms	-0.37	0.001

can have both physical and psychological consequences (38). Individuals with body dysmorphic disorder may struggle with self-acceptance, experience social rejection, and suffer from negative psychological effects (39). Women with vitiligo, beyond the physical symptoms, may worry about their appearance, leading to significant limitations in their work, emotional and social relationships, self-esteem, and overall quality of life (21). Furthermore, psychological issues such as anxiety and depression are more common in these patients (22). Given these results, it is important for psychological counselors and physicians to address both the psychological problems and the quality of life of these patients, alongside the physical aspects of vitiligo.

The second finding indicated that HRQoL could also be predicted based on depression in women with vitiligo. This finding is consistent with studies by Sakkaki et al. (40) and Fernandes et al. (41). Sakkaki et al. (40) found a significant relationship between depression and health-related quality of life, and Fernandes et al. (41) similarly reported a significant relationship between depression and quality of life.

This finding can be explained by the fact that vitiligo patients experience both physical and psychological symptoms, which may contribute to the development of depression (21). These patients often endure more severe depressive symptoms and a decline in quality of life. Depression typically results in decreased performance, fatigue, an inability to carry out daily activities, suicidal thoughts, and a further reduction in quality of life (42). Overall, depression plays a significant role in diminishing HRQoL in vitiligo patients (43). Given that vitiligo is a chronic disease with substantial physical and psychological impacts on daily life, a decrease in HRQoL in these patients is predictable.

In general, vitiligo patients suffer from various psychological, physical, familial, social, and economic challenges. This can lead to a serious decline in individual and social interactions, causing depression, which in turn further reduces their HRQoL. Health-related quality of life can serve as a predictor of the extent and impact of diseases, injuries, and disabilities, as well as a measure of mental health in patients (40). Health status, functional ability, happiness, maintaining critical bodily functions, and freedom from pain are key indicators of HRQoL. These indicators are often lacking in vitiligo patients, contributing to the onset of depression.

This study has several limitations that should be acknowledged to guide future research efforts. First, the investigation focused on women with vitiligo in Ahvaz, Iran. Therefore, caution is required when generalizing the findings to other populations with vitiligo, particularly in different geographical locations. Additionally, the study did not explore the potential influence of cultural factors on the investigated variables (HRQoL, BDD, and depression). Culture can significantly impact perceptions of health, body image, and mental well-being. Future research should consider incorporating culturally sensitive measures and designs to explore how cultural background moderates or mediates the relationships observed in this study.

Beyond cultural factors, several other avenues warrant exploration in future research. Longitudinal studies could offer valuable insights into the dynamic interplay between BDD, depression, and HRQoL in women with vitiligo. Investigating potential moderators and mediators of these relationships could help identify specific factors that exacerbate or buffer the negative impact of vitiligo on mental health and quality of life. For example, exploring the role of social

Table 3. Multiple Regression Analysis Indices for Predicting Health-Related Quality of Life Based on Body Dysmorphic Disorder and Depressive Symptoms

Models	Predictor Variables	F	R	R ²	B	β	t	P
1	Body dysmorphic disorder	71.01	0.49	0.24	0.38	0.38	4.22	0.001
2	Body dysmorphic disorder and depressive symptoms	60.27	0.60	0.36	-0.32	-0.37	-6.66	0.001

support networks, coping mechanisms, and access to mental health services could provide valuable information for developing targeted interventions to improve well-being in this population.

5.1. Conclusions

This study highlights the significant negative associations between BDD, depressive symptoms, and HRQoL in women with vitiligo. The findings suggest that BDD and depression act as independent risk factors, potentially contributing to a downward spiral in HRQoL for women with vitiligo. The observed negative correlations imply that women experiencing symptoms of either BDD, depression, or both are more likely to report lower overall well-being. Furthermore, the independent contributions of BDD and depression to HRQoL, as revealed by the regression analysis, underscore the critical need for comprehensive treatment approaches that address both conditions. These results move beyond simply documenting co-occurrence, suggesting a potential causal pathway linking BDD, depression, and HRQoL in women with vitiligo. By integrating psychological interventions targeting BDD and depression alongside traditional vitiligo treatment plans, healthcare professionals can work towards improving the overall well-being of women with this condition. The findings emphasize the importance of a holistic approach that addresses both the physical manifestations and the psychological consequences of vitiligo.

Footnotes

Authors' Contribution: M. N.: Developed the study concept, design, and acquired the data; R. J. F.: Analyzed and interpreted the data, and wrote the first draft of the manuscript; M. N. and R. J. F.: Contributed to the intellectual content, and manuscript editing and read and approved the final manuscript.

Conflict of Interests Statement: The authors declare that they have no conflict of interests.

Data Availability: The dataset used in the present study will be provided by the corresponding author

upon reasonable request.

Ethical Approval: This study was approved by the Research Ethics Committee of the Ahvaz Branch, Islamic Azad University ([IR.IAU.AHVAZ.REC.1402.071](https://doi.org/10.1007/978-3-319-45134-3_4-1)).

Funding/Support: This study received no grant from any institution/company/university.

Informed Consent: Written informed consent was obtained from the participant.

References

- Ibrahim AA, Bagherani N, Smoller BR, Reyes-Baron C, Bagherani N. Functions of the Skin. *Atlas Dermatol Dermatopathol Venereol*. Berlin: Springer; 2021. p. 1-11. https://doi.org/10.1007/978-3-319-45134-3_4-1.
- Abdallah F, Mijouin L, Pichon C. Skin Immune Landscape: Inside and Outside the Organism. *Mediators Inflamm*. 2017;2017:5095293. [PubMed ID: 29180836]. [PubMed Central ID: PMC5664322]. <https://doi.org/10.1155/2017/5095293>.
- Hung CT, Huang HH, Wang CK, Chung CH, Tsao CH, Chien WC, et al. Pregnancy outcomes in women with vitiligo: A Taiwanese nationwide cohort study. *PLoS One*. 2021;16(3):e0248651. [PubMed ID: 33750961]. [PubMed Central ID: PMC7984608]. <https://doi.org/10.1371/journal.pone.0248651>.
- Kowalewska B, Jankowiak B, Krajewska-Kulak E, Khvorik DF, Niczyporuk W. Quality of life in skin diseases as perceived by patients and nurses. *Postepy Dermatol Alergol*. 2020;37(6):956-61. [PubMed ID: 33603616]. [PubMed Central ID: PMC7874861]. <https://doi.org/10.5114/ada.2019.86182>.
- Gisoni P, Puig L, Richard MA, Paul C, Nijsten T, Taieb C, et al. Quality of life and stigmatization in people with skin diseases in Europe: A large survey from the 'burden of skin diseases' EADV project. *J Eur Acad Dermatol Venereol*. 2023;37 Suppl 7:6-14. [PubMed ID: 37806002]. <https://doi.org/10.1111/jdv.18917>.
- Gharib K, Gadallah H, Elsayed A. Chemokines in Vitiligo Pathogenesis: CXCL10 and 12. *J Clin Aesthet Dermatol*. 2021;14(9):27-32. [PubMed ID: 34980968]. [PubMed Central ID: PMC8675339].
- Özçelik S, Kulaç İ, Yazıcı M, Öcal E. Distribution of childhood skin diseases according to age and gender, a single institution experience. *Turk Pediatri Ars*. 2018;53(2):105-12. [PubMed ID: 30116131]. [PubMed Central ID: PMC6089785]. <https://doi.org/10.5152/TurkPediatriArs.2018.6431>.
- Chang WL, Lee WR, Kuo YC, Huang YH. Vitiligo: An Autoimmune Skin Disease and its Immunomodulatory Therapeutic Intervention. *Front Cell Dev Biol*. 2021;9:797026. [PubMed ID: 34970551]. [PubMed Central ID: PMC8712646]. <https://doi.org/10.3389/fcell.2021.797026>.
- Joge RR, Kathane PU, Joshi SH. Vitiligo: A Narrative Review. *Cureus*. 2022;14(9):e29307. [PubMed ID: 36304341]. [PubMed Central ID: PMC9586189]. <https://doi.org/10.7759/cureus.29307>.

10. Malik S, Cohen PR. Vitiligo-Associated Autoimmune Disorders: A Woman With Vitiligo and Incipient Hypothyroidism. *Cureus*. 2021;**13**(10). e19164. [PubMed ID: 34873507]. [PubMed Central ID: PMC8631507]. <https://doi.org/10.7759/cureus.19164>.
11. Yang TT, Lee CH, Lan CE. Impact of Vitiligo on Life Quality of Patients: Assessment of Currently Available Tools. *Int J Environ Res Public Health*. 2022;**19**(22). [PubMed ID: 36429664]. [PubMed Central ID: PMC9690871]. <https://doi.org/10.3390/ijerph192214943>.
12. Ebrahimi A, Ahmadi M, Mahmoudi S. The Impact of Self-efficacy and Health Literacy on Medication Adherence and Health-related Quality of Life in Patients with Heart Failure: A Systematic Review. *J Clin Res Paramed Sci*. 2022;**11**(2). e118666. <https://doi.org/10.5812/jcrps-118666>.
13. Daundasekara SS, Arlinghaus KR, Johnston CA. Quality of Life: The Primary Goal of Lifestyle Intervention. *Am J Lifestyle Med*. 2020;**14**(3):267-70. [PubMed ID: 32477025]. [PubMed Central ID: PMC7232900]. <https://doi.org/10.1177/1559827620907309>.
14. Dipnall JF, Rivara FP, Lyons RA, Ameratunga S, Brussoni M, Lecky FE, et al. Health-Related Quality of Life (HRQoL) Outcomes Following Injury in Childhood and Adolescence Using EuroQol (EQ-5D) Responses with Pooled Longitudinal Data. *Int J Environ Res Public Health*. 2021;**18**(19). [PubMed ID: 34639458]. [PubMed Central ID: PMC8507627]. <https://doi.org/10.3390/ijerph181910156>.
15. Defar S, Abraham Y, Reta Y, Deribe B, Jisso M, Yeheyis T, et al. Health related quality of life among people with mental illness: The role of socio-clinical characteristics and level of functional disability. *Front Public Health*. 2023;**11**:1134032. [PubMed ID: 36875411]. [PubMed Central ID: PMC9978447]. <https://doi.org/10.3389/fpubh.2023.1134032>.
16. Magin P, Fisher K. Body dysmorphic disorder, skin diseases and psychological morbidity: common and complex. *Br J Dermatol*. 2022;**187**(1):5. [PubMed ID: 35506175]. [PubMed Central ID: PMC9542795]. <https://doi.org/10.1111/bjd.21586>.
17. Bellard A, Urgesi C, Cazzato V. Self-body recognition and attitudes towards body image in younger and older women. *Arch Womens Ment Health*. 2022;**25**(1):107-19. [PubMed ID: 34331575]. [PubMed Central ID: PMC8784361]. <https://doi.org/10.1007/s00737-021-01164-x>.
18. Alessi N, Coleman H, Rayner G. Body image dissatisfaction: A novel predictor of poor quality of life in epilepsy. *Epilepsy & Behavior*. 2023;**141**. <https://doi.org/10.1016/j.yebeh.2023.109149>.
19. Favez N, Cairo Notari S. Body image, sexual activity, and side effects of treatments across the first year after surgery in women facing breast cancer: The influence of attachment insecurity. *J Psychosoc Oncol*. 2021;**39**(6):749-64. [PubMed ID: 33660590]. <https://doi.org/10.1080/07347332.2021.1890306>.
20. Yarmohammadi S, Ghaffari M, Yarmohammadi H, Hosseini Koukamari P, Ramezankhani A. Relationship between Quality of Life and Body Image Perception in Iranian Medical Students: Structural Equation Modeling. *Int J Prev Med*. 2020;**11**:159. [PubMed ID: 33312468]. [PubMed Central ID: PMC7716616]. https://doi.org/10.4103/ijpvm.IJPVM_203_19.
21. Silpa-Archa N, Pruksaekakan C, Angkoolpakdeekul N, Chaiyabutr C, Kulthanan K, Ratta-Apha W, et al. Relationship Between Depression and Quality of Life Among Vitiligo Patients: A Self-assessment Questionnaire-based Study. *Clin Cosmet Investig Dermatol*. 2020;**13**:511-20. [PubMed ID: 32801827]. [PubMed Central ID: PMC7414931]. <https://doi.org/10.2147/ccid.S265349>.
22. Hamidzadeh N, Ranjbar S, Ghanizadeh A, Parvizi MM, Jafari P, Handjani F. Evaluating prevalence of depression, anxiety and hopelessness in patients with Vitiligo on an Iranian population. *Health Qual Life Outcomes*. 2020;**18**(1):20. [PubMed ID: 32013982]. [PubMed Central ID: PMC6998062]. <https://doi.org/10.1186/s12955-020-1278-7>.
23. Jalali B, Taghvaie D, Geram K. Assessment of Effect of Group Psychotherapy by Yalom Method Using Narrative Approach on Stress, Anxiety, Depression and Life Expectancy in Women Cancer Receiving Chemotherapy. *J Clin Res Paramed Sci*. 2022;**11**(2). e133923. <https://doi.org/10.5812/jcrps-133923>.
24. Do Bú EA, Santos VMD, Lima KS, Pereira CR, Alexandre MES, Bezerra V. Neuroticism, stress, and rumination in anxiety and depression of people with Vitiligo: An explanatory model. *Acta Psychol (Amst)*. 2022;**227**:103613. [PubMed ID: 35569205]. <https://doi.org/10.1016/j.actpsy.2022.103613>.
25. Sawant NS, Vanjari NA, Khopkar U. Gender Differences in Depression, Coping, Stigma, and Quality of Life in Patients of Vitiligo. *Dermatol Res Pract*. 2019;**2019**:6879412. [PubMed ID: 31065260]. [PubMed Central ID: PMC6466925]. <https://doi.org/10.1155/2019/6879412>.
26. Samela T, Malorni W, Matarrese P, Mattia G, Alfani S, Abeni D. Gender differences in vitiligo: psychological symptoms and quality of life assessment description. *Front Psychol*. 2023;**14**:1234734. [PubMed ID: 38187434]. [PubMed Central ID: PMC10769495]. <https://doi.org/10.3389/fpsyg.2023.1234734>.
27. Nasser MAEM, Raggi El Tahlawi SM, Abdelfatah ZA, Soltan MR. Stress, anxiety, and depression in patients with vitiligo. *Middle East Current Psychiatry*. 2021;**28**(1). <https://doi.org/10.1186/s43045-021-00120-w>.
28. Alkhowailed M, Alotaibi HM, Alshwieer MA, Alazmi AK, Alotaibi NM, Alotaibi AF. The Psychological Impact of Vitiligo in Saudi Arabia. *Cureus*. 2023;**15**(8). e43767. [PubMed ID: 37727157]. [PubMed Central ID: PMC10506855]. <https://doi.org/10.7759/cureus.43767>.
29. Maxwell SE. Sample size and multiple regression analysis. *Psychol Methods*. 2000;**5**(4):434-58. [PubMed ID: 11194207]. <https://doi.org/10.1037/1082-989x.5.4.434>.
30. Ware JJ, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;**30**(6):473-83. [PubMed ID: 1593914].
31. Brazier JE, Harper R, Jones NM, O'Cathain A, Thomas KJ, Usherwood T, et al. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *Bmj*. 1992;**305**(6846):160-4. [PubMed ID: 1285753]. [PubMed Central ID: PMC1883187]. <https://doi.org/10.1136/bmj.305.6846.160>.
32. Cash T. Multidimensional Body-Self Relations Questionnaire (MBSRQ). . Third ed. Norfolk: MBSRQ USERS' MANUAL; 2000. p. 551-5. https://doi.org/10.1007/978-981-287-104-6_3.
33. Shemshadi H, Shams A, Sahaf R, Shamsipour Dehkordi P, Zareian H, Moshlem AR. Psychometric Properties of Persian Version of the Multidimensional Body-Self Relations Questionnaire (MBSRQ) Among Iranian Elderly. *Salmand*. 2020;**15**(3):298-311. <https://doi.org/10.32598/sija.15.3.61.13>.
34. Beck AT, Steer RA, Brown G. Beck Depression Inventory. Second ed San Antonio, TX, E.U. *Psycholo Corporat*. 2011. <https://doi.org/10.1037/t00742-000>.
35. Farzadkia M, Farhangi A, Abolghasemi S. Comparing the Effectiveness of Mindfulness-based Stress Reduction and Intensive Short-term Dynamic Psychotherapy in Reducing Intolerance of Uncertainty and Depression in Women with Fibromyalgia. *Women's Health Bulletin*. 2023;**10**(1):44-51. <https://doi.org/10.30476/whb.2023.97334.1206>.
36. Barberis N, Calaresi D, Cannavò M, Verrastro V. Trait emotional intelligence and quality of life in women with polycystic ovary syndrome: Dysmorphic concerns and general distress as mediators. *Compr Psychiatry*. 2023;**122**:152373. [PubMed ID: 36739836]. <https://doi.org/10.1016/j.comppsy.2023.152373>.
37. Chee IS, Kim HJ, Lee Y, Kim JW. Body Dysmorphic Disorder, Psychiatric Symptoms, and Quality of Life in Female Dermatological Patients. *Neuropsychiatr Dis Treat*. 2020;**16**:2921-8. [PubMed ID: 33311980]. [PubMed Central ID: PMC7725143]. <https://doi.org/10.2147/ndt.S284077>.
38. Phillips KA, Kelly MM. Body Dysmorphic Disorder: Clinical Overview and Relationship to Obsessive-Compulsive Disorder. *Focus (Am*

- Psychiatr Publ*). 2021;**19**(4):413-9. [PubMed ID: 35747292]. [PubMed Central ID: PMC9063569]. <https://doi.org/10.1176/appi.focus.20210012>.
39. Kuck N, Cafitz L, Bürkner PC, Hoppen L, Wilhelm S, Buhlmann U. Body dysmorphic disorder and self-esteem: a meta-analysis. *BMC Psychiatry*. 2021;**21**(1):310. [PubMed ID: 34130638]. [PubMed Central ID: PMC8207567]. <https://doi.org/10.1186/s12888-021-03185-3>.
 40. Sakkaki S, Naderi F, Hafezi F. Relationships Between Chronic Fatigue Syndrome, Experiential Avoidance, and Health-Related Quality of Life in Cervical Cancer Cases Mediated by Depression. *Women's Health Bulletin*. 2023;**10**(2):104-11. <https://doi.org/10.30476/whb.2023.98545.1228>.
 41. Fernandes MDSV, Mendonça CR, da Silva TMV, Noll P, de Abreu LC, Noll M. Relationship between depression and quality of life among students: a systematic review and meta-analysis. *Sci Rep*. 2023;**13**(1):6715. [PubMed ID: 37185375]. [PubMed Central ID: PMC10126541]. <https://doi.org/10.1038/s41598-023-33584-3>.
 42. Cho Y, Lee JK, Kim DH, Park JH, Choi M, Kim HJ, et al. Factors associated with quality of life in patients with depression: A nationwide population-based study. *PLoS One*. 2019;**14**(7). e0219455. [PubMed ID: 31295291]. [PubMed Central ID: PMC6623963]. <https://doi.org/10.1371/journal.pone.0219455>.
 43. Bibeau K, Ezzedine K, Harris JE, van Geel N, Grimes P, Parsad D, et al. Mental Health and Psychosocial Quality-of-Life Burden Among Patients With Vitiligo: Findings From the Global VALIANT Study. *JAMA Dermatol*. 2023;**159**(10):1124-8. [PubMed ID: 37647073]. [PubMed Central ID: PMC10469285]. <https://doi.org/10.1001/jamadermatol.2023.2787>.