Research Square

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Influencing factors on quality of life among patients with Vitiligo in southern China

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Abstract

Aim: This study aimed to assess QoL impairment among patients with vitiligo in southern China using a disease-specific QoL index scale, and analyze the influencing factors of QoL.

Design: A descriptive, cross-section study.

Methods: A total of 203 patients with vitiligo aged ≥18 years attending the physiotherapy department of a tertiary dermatology hospital in southern China, were included in the study. Their QoL and psychological states were assessed using the QoL scale and the Hospital Anxiety and Depression (HADS) Scale, respectively. Univariate analysis and multiple stepwise linear regression analysis was conducted.

Results: The respondents included 94 males and 109 females, and the average age of them was 32.48 ± 17.10 years. The average score of QoL, anxiety and depression were 43 (22–61), 6 (4–8) and 5 (3–8), respectively. Patients in the divorced or widowed, female, smoking, staying up late (SUL), facial lesions, anxiety, and depression groups had exhibited higher QoL scores.

Patient or Public Contribution: The patients filled out the questionnaire correctly under the direction of the nurses, and nurses completed the data collection.

1. INTRODUCTION

Vitiligo is a common acquired depigmentation skin disease, and its primary clinical manifestation is the loss of melanocytes in the skin and mucosa. The psychological and quality of life (QoL) impact of this disease is being increasingly recognized, which have gradually become an important auxiliary to the current nursing work.

2. BACKGROUND

Vitiligo is a common acquired depigmenting disorder that manifests clinically as the loss of melanocytes in the skin and mucosa(Hamidizadeh et al., 2020, Abdullahi et al., 2021). The worldwide prevalence of this disease is estimated at approximately 0.5%–2% (Bergqvist and Ezzedine, 2020). Despite the many therapies available for vitiligo, none offer a complete cure (Valle et al., 2018). Furthermore, its clinical course is unpredictable and relapses can occur. More than just cosmetic concerns, depigmented patches in vitiligo can be psychologically devastating, severely affecting the patient quality of life (QoL) (Cupertino et al., 2017). One study found that 62.29% of patient's with vitiligo suffered from depression (Simons et al., 2020), and another reported that 4%–62% of such patients had anxiety (Liu et al., 2021a). There is an increasing awareness that decreasing the degree of psychological burden can contribute to the improvement of QoL among patients with vitiligo and optimize disease management (Ning et al., 2022). Therefore, it is necessary to accurately assess anxiety and depression in patients with vitiligo using appropriate evaluation scales and take appropriate interventions to reduce their mental stress and improve QoL.

Some scales can be used to investigate the QoL of patients with vitiligo, including the Dermatology Life Quality Index (DLQI) and Skindex instruments, consist of Skindex-29 or Skindex-16 (Picardo,et al.,2022).However, although these scales are widely applicable to various skin diseases, they do not encompass all the aspects of vitiligo evaluation. A more sensitive scale called vitiligo QoL (VitiQoL) was designed by Lily et al. in 2013. The VitiQoL scale evaluates three principal factors, i.e., stigma, participation -limitation, and behavior, which are more applicable in patients with vitiligo (Lilly et al., 2013). A majority of these patients often suffer from shame, embarrassment, low self-esteem, and other psychological problems (Bergqvist and Ezzedine, 2020), which may be closely associated with their QoL.

Several studies from different countries have employed the VitiQoL scale for the assessment of QoL among patients with vitiligo (Abdullahi et al., 2021, Pun et al., 2021). Although the VitiQoL scale has been translated into Chinese and the reliability and validity of the Chinese version are satisfactory, this scale has seldom been evaluated and used in clinical practice in China. Therefore, this study aimed to investigate QoL in patients with vitiligo in southern China using the Chinese version of the VitiQoL scale to assess the correlation between QoL and psychological states (such as depression and anxiety) and identify factors significantly related to QoL.

The current study sought to investigate the factors affecting the quality of life of such patients, and provided a certain reference basis for psychological care, in order to improve the QoL of patients with vitiligo.

3. THE STUDY

3.1 Aim and objective

The aim of the study was to explore influencing factors of QoL on patients with vitiligo and provide guidelines for comprehensive nursing.

4. METHODS

4.1 Design

This study utilized a cross sectional design, and results were reported in line with *STROBE* criteria (von Elm et al., 2007).

4.2 Observation indicators and method

The study questionnaire comprised four parts. The first part included several baseline demographics, such as age, gender, marital status, level of education, smoking status, alcohol consumption status, and SUL-behaviors (going to bed after 23 o'clock frequently for nearly 6 months) (Zeng et al., 2023), and family history, whereas the second part contained disease characteristics, including the type, lesion sites, stage (the Chinese consensus on the diagnosis and treatment of vitiligo divides it into progressive and stable stage. In order to gain a more detailed understanding of the patient's quality of life and mental state, we also analyzed patients in the rapidly progressing phase. The relevant definitions and criteria are shown in Table 1), and duration of the disease. The third part was the Chinese version of the VitiQoL scale, which comprised 15 questions with a 7-point Likert scale (0–6) and included the three domains of stigma, participation limitation, and behavior. The overall score ranged from 0 to 90, with higher scores indicating a more severe impact on QoL (Lilly et al., 2013). Finally, the fourth part was the HADS scale (Zigmond and Snaith, 1983). The HADS scale has been widely used to investigate dermatological patients, including those with vitiligo (Quinto et al., 2022, Lai et al., 2017, Osinubi et al., 2018). The HADS scale contained 14 items, of which 7 items each evaluated anxiety and depression. The items were rated on a 4-point scale, indicating how the respondents felt during the week before the measurement. The scores of the two subscales of anxiety and depression were divided as follows: 0–7, normal; 8–10, borderline; and 11–21, definite, which need further evaluations by specialty psychologists (Zigmond and Snaith, 1983, Manav et al., 2022).

Table 1
Definitions and criteria of vitiligo in China

Phases	**Progressive stage** **(Lesions that met any one of the following three criteria were defined as being in the progressive stage)**	**Stable stage** **(Lesions that met all the following criteria were defined as being in the stable stage)**
Criteria	(1) VIDA score > 1; (2) inflammatory, trichromatic, confetti-like lesions, or hypopigmented patches with indistinct white margins; (3) appearance of an isomorphic reaction in the last 1 year. (4)The hypochromic areas are larger when examined under a Wood lamp than under daylight conditions. VIDA ≥ 4 points indicates that the disease is in the rapidly progressive stage	(1) VIDA score of 0; (2) appearance of porcelain white spots with clear borders or pigmentation and other clinical features; (3) no isomorphic reaction in the past 1 year; (4) white spot lesion with clear borders under Wood's lamp examination, and a smaller lesion area under the Wood's lamp than under the naked eye.

4.3 Patients data collection

The data were collected via a questionnaire, including VitiQoL scale and HADS scale.

4.4 Sample size calculation

A total of 14 variables were included in this study to investigate the various factors that affect QOL among patients with vitiligo. According to the rule, the results are considered significant when the sample size is > 10 times the number of variables (Memon et al., 2020). Thus, at least 140 participants were required for this study; 203 patients with vitiligo were finally enrolled.

4.5 Population and sample

This cross-sectional self-reporting assessment-based study was conducted at a tertiary dermatology hospital in southern China. Participants were recruited from July 2022 to June 2023 using the convenience sampling method.

4.6 Inclusion and exclusion criteria

The inclusion criteria were as follows: (1) patients with vitiligo previously diagnosed by a dermatologist and (2) adults aged 18–75 years. The exclusion criteria included (1) patients with severe mental illnesses (e.g., schizophrenia and bipolar disorder) and (2) those with cognitive disorders or having difficulties understanding questions or communicating. Of note, all participants were patients who received either narrow-band ultraviolet B, 308-nm excimer laser, or CO_2 fractional laser treatment in the physiotherapy department.

4.7 Data analysis

Data analyses were performed using SPSS software (version 26.0), and figures were plotted via the R software (version 4.1.2). Numerical data in this study are presented as medians and interquartile ranges, as they did not conform to normal distribution. Descriptive statistics are presented as the frequency and percentage. Nonparametric data were evaluated using the rank sum test for the univariate analysis of QoL, and based on the results, multiple stepwise linear regression analysis was performed, Since the QoL do not follow a normal distribution, we transformed QoL using rank based inverse normal transformation (INT) implemented in R-package "RNOmni" (https://10.32614/CRAN.package.RNOmni). The chi-squared test was used to compare the proportion of anxiety and depression across all patient categories. $P < 0.05$ was considered statistically significant.

5. RESULTS

5.1 Demographic and clinical characteristics and their scores

A total of 203 participants completed the questionnaires. Table 2 shows that the study population predominantly comprised females (53.69%) and young participants aged 21–30 years (43.35%). Moreover, a majority were married (48.77%), highly educated (bachelor's degree or higher) (41.87%), nonsmokers (80.79%), and nonalcoholic (66.50%). Finally, most rarely SUL (68.97%), had nonsegmental vitiligo (52.17%), had lesions on the face (57.14%), had progressive disease (66.5%), had a disease duration of > 10 years (44.33%), and had no family history of vitiligo (89.16%). Table 1 also describes the median and interquartile scores of QoL [43.00, (22.00, 61.00)], participation limitations [14.00, (5.00, 24.00)], stigma [17.00, (10.00, 23.00)], behavior score [8.00, (4.00, 13.00)], anxiety score [6.00, (4.00, 8.00)], and depression score [5.00, (3.00, 8.00)]. The results showed that compared with other populations, those females, aged 41–50 years, smokers, often SUL, widowed or divorced, patients with a degree of education primary school and below, patients without family history, patients with lesion site of face, the mixed-type vitiligo patients, and the progressive-vitiligo patients showed higher scores of QoL indicating worse quality of life.

Table 2
General information and scores of each scale.

Variables		n (%)	Quality of life	participation limitation	stigma	behavior	Anxiety	Depression
			$M(P_{25}, P_{75})$					
Total		203(100.00)	43.00(22.00, 61.00)	14.00(5.00, 24.00)	17.00(10.00, 23.00)	8.00(4.00, 13.00)	6.00(4.00, 8.00)	5.00(3.00, 8.00
Gender	Male	94(46.31)	34.00(17.00, 54.00)	10.00(3.00, 21.00)	13.00(9.00, 19.25)	6.00(2.00, 11.00)	5.00(3.00, 8.00)	4.50(2.00, 8.00
	Female	109(53.69)	48.00(29.50, 68.50)	16.00(9.00, 27.00)	20.00(12.00, 24.00)	10.00(5.00, 14.00)	6.00(4.00, 9.00)	5.00(3.00, 7.50
Age	≤ 20 years	22(10.84)	27.50(14.00, 47.00)	8.50(2.00, 15.75)	9.50(4.75, 18.00)	7.00(1.75, 11.25)	5.00(0.75, 7.25)	4.50(1.75, 8.00
	21 ~ 30 years	88(43.35)	37.00(21.00, 66.00)	14.00(4.25, 24.75)	17.00(9.25, 25.75)	6.50(3.25, 14.00)	5.50(4.00, 8.00)	5.00(3.00, 7.75
	31 ~ 40 years	52(25.62)	46.00(24.50, 61.00)	15.00(6.50, 25.75)	17.50(11.25, 22.00)	9.00(4.00, 13.00)	5.50(3.00, 8.00)	5.00(2.25, 8.00
	41 ~ 50 years	23(11.33)	57.00(40.00, 78.00)	21.00(15.00, 34.00)	20.00(13.00, 27.00)	11.00(6.00, 15.00)	7.00(4.00, 10.00)	6.00(2.00, 8.00
	51 ~ 60 years	12(5.91)	45.00(27.75, 66.75)	16.00(12.00, 21.75)	20.50(9.75, 27.00)	5.00(1.00, 15.00)	6.50(2.00, 7.75)	4.50(2.25, 7.50
	61 ~ 70 years	6(2.96)	32.50(18.00, 49.75)	10.00(4.25, 16.25)	15.50(9.75, 20.75)	5.00(0.75, 12.00)	7.00(3.5, 10.00)	4.50(2.25, 7.50
Marital status	Unmarried	98(48.28)	33.50(17.75, 56.25)	10.50(3.00, 21.00)	13.00(8.00, 20.25)	6.00(2.75, 12.00)	5.00(3.00, 8.00)	5.00(2.00, 7.00
	Married	99(48.77)	49.00(30.00, 61.00)	16.00(9.00, 26.00)	20.00(12.00, 24.00)	9.00(4.00, 13.00)	6.00(4.00, 9.00)	5.00(3.00, 8.00
	Divorced/widowed	6(2.96)	69.50(44.50, 92.25)	30.00(15.00, 39.00)	21.50(15.00, 30.00)	14.00(11.25,17.25)	8.50(5.25, 13.75)	6.00(1.75,10.5)
Education levels	Primary and below	4(1.97)	50.00(27.75, 82.75)	22.50(12.25, 37.25)	17.50(9.75, 23.75)	8.00(3.25, 16.50)	10.00(3.25, 19.00)	8.00(3.00, 18.25)
	Junior high school	20(9.85)	46.00(23.00, 56.25)	15.50(2.50, 19.25)	16.50(9.75, 23.25)	7.00(2.50, 12.75)	5.50(3.25, 8.50)	5.00(3.00, 7.75
	Senior high school	40(19.70)	41.00(22.50, 64.00)	14.50(4.50, 22.00)	18.50(9.25, 23.00)	6.50(3.00, 13.00)	7.00(4.00, 9.00)	6.00(4.00, 8.00
	College	54(26.60)	49.50(21.00, 71.50)	16.50(6.00, 29.25)	17.00(10.00, 25.00)	10.00(5.00, 14.25)	7.00(4.00, 9.00)	6.00(3.00, 9.00
	Bachelor's degree or above	85(41.87)	41.00(20.00, 57.00)	13.00(4.00, 22.50)	17.00(9.00, 22.00)	7.00(3.50, 12.00)	5.00(3.00, 7.00)	4.00(2.00, 6.50
Smoking status	Yes	39(19.21)	54.00(31.00, 70.00)	20.00(9.00, 28.00)	19.00(13.00, 26.00)	10.00(4.00, 16.00)	6.00(4.00, 9.00)	6.00(3.00,10.00
	No	164(80.79)	39.00(21.00, 57.75)	14.00(4.00, 22.00)	15.50(9.00, 23.00)	7.00(3.00, 12.00)	5.00(3.00, 8.00)	5.00(3.00,7.00)
Alcohol consumption status	Yes	68(33.50)	43.00(21.25, 60.75)	13.50(4.50, 24.75)	18.00(9.00, 25.50)	8.50(3.00, 13.75)	6.00(3.00, 8.75)	5.00(3.00, 8.00
	No	135(66.50)	43.00(22.00, 61.00)	15.00(5.00, 23.00)	15.00(10.00, 23.00)	8.00(4.00, 13.00)	6.00(4.00, 8.00)	5.00(3.00, 7.00
SUL-behaviors	Yes	63(31.03)	51.00(33.00, 69.00)	16.00(9.00, 29.00)	21.00(12.00, 26.00)	10.00(5.00, 14.00)	6.00(4.00, 9.00)	6.00(3.00, 8.00
	No	140(68.97)	37.00(19.25, 57.00)	13.00(4.00, 22.00)	15.00(9.00, 21.00)	6.00(3.00, 12.00)	5.00(3.25, 8.00)	4.00(3.00, 7.00
Type of vitiligo	Segmental	66(32.51)	45.50(23.75, 57.00)	14.50(6.00, 21.00)	18.00(10.00, 22.25)	7.00(4.00, 12.25)	6.00(4.00, 9.00)	5.00(3.00,7.25)
	Non-segmental	107(52.71)	41.00(20.00, 65.00)	14.00(4.00, 26.00)	15.00(9.00, 24.00)	8.00(3.00, 14.00)	5.00(3.00, 8.00)	5.00(2.00,8.00)
	Mixed	14(6.90)	50.00(13.25, 60.25)	18.00(3.50, 23.25)	18.50(5.50, 21.75)	7.50(3.00, 12.00)	6.00(3.75, 8.25)	5.50(2.50,8.00)
	Undefined	16(7.88)	43.00(23.00, 74.50)	16.00(5.25, 31.75)	18.50(12.00, 25.25)	9.00(2.50, 14.00)	5.50(3.00, 8.00)	4.50(3.00,6.75)

Variables		n (%)	Quality of life	participation limitation	stigma	behavior	Anxiety	Depression
			$M(P_{25}, P_{75})$					
Sites	Face	116(57.14)	47.00(24.25, 66.00	16.00(8.00, 26.75)	17.50(10.00, 23.75)	9.00(4.25, 14.00)	6.00(4.00, 9.00)	5.00(3.00,8.00)
	Other parts	87(42.86)	37.00(20.00, 54.00)	12.00(4.00, 20.00)	16.00(9.00, 23.00)	7.00(3.00, 11.00)	5.00(3.00, 8.00)	5.00(3,00, 7.00)
Stages	Rapid progress	5(2.46%)	54.00(36.00, 93.50)	21.00(12.50, 40.00)	22.00(14.50, 30.00)	10.00(5.50, 17.50)	11.00(6.00, 15.00)	7.00(3.00, 10.50)
	Progress	135(66.50%)	39.00(22.00, 61.00)	13.00(4.00, 23.00)	15.00(9.00, 23.00)	7.00(4.00, 13.00)	6.00(4.00, 8.00)	5.00(3.00, 8.00)
	Stable	63(31.03%)	46.00(21.00, 60.00)	15.00(6.00, 24.00)	18.00(10.00, 23.00)	9.00(4.00, 12.00)	5.00(3.00, 9.00)	5.00(2.00, 7.00)
Duration	< 1year	54(26.60%)	35.50(17.75, 59.25)	13.50(3.50, 24.25)	15.00(9.00, 23.25)	6.00(2.00, 12.00)	5.50(3.00, 8.00)	4.00(3.00, 8.00)
	1-3years	59(29.06%)	43.00(27.00, 57.00)	14.00(9.00, 22.00)	17.00(12.00, 23.00)	8.00(4.00, 12.00)	6.00(5.00, 9.00)	6.00(4.00, 8.00)
	> 3years	90(44.33%)	46.50(22.00, 66.00)	14.50(5.75, 24.50)	17.50(8.75, 23.00)	9.00(5.00, 14.00)	5.00(3.00, 8.00)	4.00(2.00, 7.00)
Family history	Yes	22(10.84%)	43.50(16.75, 63.75)	14.50(3.75, 25.00)	18.00(8.25, 26.75)	9.00(4.00, 14.00)	5.50(3.00, 8.25)	4.50(2.75, 8.00)
	No	181(89.16%)	43.00(22.00, 61.00)	14.00(5.50, 24.00)	17.00(10.00, 23.00)	8.00(3.50, 13.00)	6.00(4.00, 8.00)	5.00(3.00, 8.00)

5.2 Factors affecting QoL scales of patients with vitiligo

Wilcoxon rank sum test and Kruskal-Wallis H test were used to investigate factors affecting the QoL scales of patients. As shown in Table 3, the scores were different in terms of gender (Z = − 3.408, *P* = 0.001), marital status (H = 15.069, *P* = 0.001), smoking status (Z = 2.072 *P* = 0.038), SUL-behaviours (Z = 2.735, *P* = 0.006), disease sites (Z = 1.993, *P* = 0.046), anxiety level (H = 63.183, *P* < 0.001), and depression level (H = 28.329, *P* < 0.001). Furthermore, regarding anxiety, 136 were normal, 40 were borderline, and 27 were definite anxiety cases. In terms of depression, 150 were normal, 36 were borderline, and 17 were definite cases. However, no significant difference was found in patients with different ages (H = 10.973, *P* = 0.052), education level (H = 1.937, *P* = 0.747), drinking status (Z = 0.334, *P* = 0.738), type of vitiligo (H = 0.221, *P* = 0.974), disease stage (H = 2.542, *P* = 0.281), and disease duration (H = 1.457, *P* = 0.483), family history (Z = 0.186, *P* = 0.852).

Table 3
Analysis of influencing factors on quality of life scores.

Variables		N	Quality of life $M(P_{25}, P_{75})$	Z/ H	*P*
Gender	Male	94	34.00(17.00, 54.00)	-3.408[a]	0.001
	Female	109	48.00(29.50, 68.50)		
Age	≤ 20 years	22	27.50(14.00, 47.00)	10.973[b]	0.052
	21 ~ 30 years	88	37.00(21.00, 66.00)		
	31 ~ 40 years	52	46.00(24.50, 61.00)		
	41 ~ 50 years	23	57.00(40.00, 78.00)		
	51 ~ 60 years	12	45.00(27.75, 66.75)		
	61 ~ 70 years	6	32.50(18.00, 49.75)		
Marital status	Unmarried	98	33.50(17.75, 56.25)	15.069[b]	0.001
	Married	99	49.00(30.00, 61.00)		
	Divorced/widowed	6	69.50(44.50, 92.25)		
Education levels	Primary and below	4	50.00(27.75, 82.75)	1.937[b]	0.747
	Junior high school	20	46.00(23.00, 56.25)		
	Senior high school	40	41.00(22.50, 64.00)		
	College	54	49.50(21.00, 71.50)		
	Bachelor's degree or above	85	41.00(20.00, 57.00)		
Smoking status	Yes	39	54.00(31.00, 70.00)	2.072[a]	0.038
	No	164	39.00(21.00, 57.75)		
Alcohol consumption status	Yes	68	43.00(21.25, 60.75)	0.334[a]	0.738
	No	135	43.00(22.00, 61.00)		
SUL-behaviors	Yes	63	51.00(33.00, 69.00)	2.735[a]	0.006
	No	140	37.00(19.25, 57.00)		
Type of vitiligo	Segmental	66	45.50(23.75, 57.00)	0.221[b]	0.974
	Non-segmental	107	41.00(20.00, 65.00)		
	Mixed	14	50.00(13.25, 60.25)		
	Undefined	16	43.00(23.00, 74.50)		
Sites	Face	116	47.00(24.25, 66.00)	1.993[a]	0.046
	Other parts	87	37.00(20.00, 54.00)		
Stages	Rapid progress	5	54.00(36.00, 93.50)	2.542[b]	0.281
	Progress	135	39.00(22.00, 61.00)		
	Stable	63	46.00(21.00, 60.00)		
Duration	< 1year	54	35.50(17.75, 59.25)	1.457[b]	0.483
	1-3years	59	43.00(27.00, 57.00)		
	> 3years	90	46.50(22.00, 66.00)		
Family history	Yes	22	43.50(16.75, 63.75)	0.186[a]	0.852
	No	181	43.00(22.00, 61.00)		
Anxiety levels	Normal	136	30.50(17.25, 47.00)	63.183[b]	< .001
	Borderline	40	57.50(46.25, 71.50)		
	Definite cases	27	79.00(57.00, 91.00)		

Variables		N	Quality of life $M(P_{25}, P_{75})$	Z/ H	*P*
Depression levels	Normal	150	34.50(18.00, 55.50)	28.329[b]	< .001
	Borderline	36	54.00(38.50, 70.00)		
	Definite cases	17	60.00(51.00, 89.50)		

[a]: Wilcoxon rank-sum test; [b]: Kruskal-Wallis H test.

5.3 Relationships among QoL, anxiety, and depression scores

Table 4 presents the results of Spearman's correlation analysis. The results revealed a significant, positive correlation between QoL and anxiety scores (Spearman's $r = 0.648$, $P < 0.01$), and between QoL and depression scores (Spearman's $r = 0.466$, $P < 0.01$). In addition, there was a significant relationship between anxiety and depression scores (Spearman's $r = 0.708$, $P < 0.01$).

Table 4
QoL correlation analysis results.

QoL scores	QoL scores	Anxiety scores	Depression scores
	1		
Anxiety scores	0.648**	1	
Depression scores	0.466**	0.708**	1
*: *P*<0.05;**P<0.01			

5.4 Multivariate analysis of factors affecting QoL scales of patients with vitiligo

The INT QoL of patients with vitiligo was tested as dependent variables with seven variables reported as independent variables in Table 3, including gender, smoking status, SUL-behaviours, disease sites, marital status, anxiety and depression levels. The results of multiple linear regression analysis are shown in Table 5. The results revealed that gender, marital status, smoking status, SUL-behaviors and anxiety levels were associated with INT QoL ($P < 0.05$). Patients with vitiligo who are female, married, smoking, having SUL-behaviors and higher anxiety levels have a worse QoL.

Table 5
Multiple linear regression of factors affecting the INT quality of life of patients with Vitiligo.

Variables		*β*	*t*	*p*
Gender	Male	Ref.		
	Female	0.381	3.167	0.002
Marital status	Unmarried	Ref.		
	Married	0.293	2.591	0.010
	Divorced/ widowed	0.572	1.717	0.088
Smoking status	Yes	Ref.		
	No	-0.437	-2.917	0.004
SUL-behaviors	Yes	Ref.		
	No	-0.329	-2.736	0.007
Anxiety levels	Normal	Ref.		
	Borderline	0.797	5.645	< .001
	Definite cases	1.242	7.488	< .001

5.5 Factors influencing anxiety and depression in patients with vitiligo

The anxiety and depression scores were classified into three groups to compare anxiety and depression severity among the different categories using the chi-squared test. The results showed that education level ($\chi^2 = 17.88$, $P = 0.02$), site of onset ($\chi^2 = 6.18$, $P = 0.05$), and disease stage ($\chi^2 = 12.85$, $P = 0.01$) were the important influencing factors of anxiety severity (Fig. 1–3). In the other groups, no other significant differences were observed. In addition, there were no statistically significant differences in terms of depression severity among patients of different demographic and clinical groups.

6. DISCUSSION

Vitiligo is the most common pigment disorder worldwide that can affect all races, age groups, and social brackets (Valle et al., 2018). Notably, it cannot be ignored that vitiligo can not only cause a greater economic burden on patients but also lead to psychological problems, which can decrease their QoL. Thus,

high-quality nursing for patients with vitiligo is not merely about the illness. Depending on this, assessing the QoL of patients with vitiligo using specific scales is worthwhile and meaningful in countries with different cultural values. The present study revealed that the total VitiQoL score of the participants is similar to previous studies that employed VitiQoL (Bibeau et al., 2022, Boza et al., 2015). This suggests that the QoL of patients with vitiligo from different countries has been affected to certain degrees.

6.1 The main factors affecting the QoL of patients with vitiligo include gender, marital status, smoking status, SUL-behaviours, and anxiety levels

The analysis of influencing factors revealed that the main influencing factors of the QoL of patients with vitiligo were marital status, gender, smoking status, SUL-behaviors, and anxiety levels. These variables are discussed in the following paragraphs.

This study showed that marital status was one of the factors that influenced the QoL of patients with vitiligo. This result is inconsistent with the findings of a previous study, which stated that marital status did not impair QoL (Anaba and Oaku, 2020). In the present study, the QoL of divorced or widowed patients was most seriously affected, followed by that of married and unmarried people. However, only six divorced or widowed people were included in this study, indicating a small sample. Therefore, this paragraph focuses only on married and unmarried people. The present study finding disagrees with the results reported by Kota et al. (Kota et al., 2019) who used DLQI, and revealed that unmarried patients have higher QoL scores than married patients. However, our finding is similar to the results of Yang et al. (Yang et al., 2022) who found that married patients with vitiligo exhibited greater emotional and appearance-related impairments than unmarried patients and thereby had a lower QoL. This can be attributed to higher marital stress experienced by married patients because of the fear that their spouses may have negative perceptions and feelings toward them because of their skin changes. The above contradictory findings may be caused by different questionnaire designs or cultural differences, which should be validated using additional research.

In terms of gender, the QoL of females was much more impaired than that of males, which is consistent with the results of other studies (Abdullahi et al., 2021, Hedayat et al., 2016). This sex-based difference may be attributed to women tending to care more about their appearance, self-esteem, and clothing choices than men, increasing the susceptibility of their QoL to impact. Therefore, more attention should be paid to female patients, particularly married female patients, who fear that their skin appearance may damage their marriage (Pun et al., 2021).

Concerning smoking, it has been reported that the prevalence of mental health disorders in smokers is higher than that in the general population and that smoking is positively correlated with mental illness (Hammett et al., 2019, Fluharty et al., 2017). Moreover, smoking is negatively associated with life satisfaction (Dong et al., 2020). In the present study, there was no difference in the anxiety or depression scores between smokers and nonsmokers. However, smokers had higher QoL scores than nonsmokers, in line with the findings of a previous study, which suggested that smoking can negatively influence the QoL of patients with skin diseases by aggravating their condition (Duran and Yürekli, 2023). Thus, it is recommended that patients with vitiligo quit smoking, or at least reduce the number of cigarettes smoked, to reduce its impact on their QoL.

It has been widely accepted that vitiligo is an autoimmune skin disease that leads to depigmentation patches (Rodrigues et al., 2017, Frisoli et al., 2020). Moreover, many studies have reported that various autoimmune diseases are associated with sleep disorders (Hsiao et al., 2015, Seo et al., 2018). Therefore, patients with sleep disorders may be at a potential risk for developing vitiligo (Seo et al., 2018). One study (Liu et al., 2021b) revealed that 49.9% of patients with vitiligo had insufficient sleep, and more than half of the vitiligo patients with insomnia had adjustment sleep disorders because of vitiligo. In the present study, the median score of QoL of patients who often SUL was 51 points, much higher than the score of patients who did not often SUL (37 points). Thus, SUL-behaviors affected QoL. These results suggest that there may be a bidirectional relationship between vitiligo and sleep duration or quality.

The present study revealed that the total scores of anxiety and depression were lower than those determined by Ajose et al. (Ajose et al., 2014) among Nigerian patients. This may be because compared with light-skinned patients with vitiligo, dark-skinned patients are more likely to have negative emotions owing to obvious discoloration (Yang et al., 2022). The proportion of patients with vitiligo having anxiety symptoms (13.30%) in this study was higher than that with depression (8.37%). Furthermore, anxiety, but not depression, affected the QoL of patients with vitiligo. This result is inconsistent with the research conducted by Kota et al. (Kota et al., 2019) who reported that patients with depression had impaired QoL. This is likely because of the different instruments used. This also indicates that the depression levels of the participants in the present study may not be severe enough to affect their QoL significantly. However, the psychological aspects of the patients with vitiligo should still be monitored, as the QoL score was higher in the stigma dimension.

6.2 Level of education, disease site, and disease stage were not the main influencing factors of QoL of patients with vitiligo, but also worth mentioning

The current study revealed that education level was not the main factor affecting the quality of life, which is in agreement with the results of Anaba et al.'s study (Anaba and Oaku, 2020). It is also similar to He et al.'s study, which found that education level is not associated with health-related quality of life for 16 skin diseases. Nevertheless, there were statistical differences in the anxiety levels among patients with different levels of education. Among the definite cases of anxiety, 37.04% had a bachelor's degree or higher, followed by 33.33% who completed college-level education and 18.52% with high school-level education; the proportion of those who completed junior high school or lower was 11.11%. These results indicate that patients with higher educational degrees tend to be more prone to anxiety. This result is inconsistent with that of previous studies, which revealed that higher-level education could help reduce the risk of developing depression and anxiety symptoms (Samudio-Cruz et al., 2023, Alharbi, 2020).

It should be mentioned that patients with facial skin lesions had significantly higher QoL scores than those who had lesions on the other parts of the body, which is in line with the results of a previous study (Bibeau et al., 2022). Moreover, the present study revealed that this type of patient is more prone to anxiety, as patients with vitiligo lesions on visible areas might be more concerned about others' perspectives and worried about any potential consequences. Consequently, they may not be willing to participate in social activities and their behaviors may be affected to some extent, leading to worse QoL. Thus, more care and encouragement should be given to such patients, and they may be offered practical advice such as treating the disease positively and applying cover cream when necessary.

In terms of the disease stage, Dabas et al. (Dabas et al., 2020) reported that patients with progressive vitiligo had worse QoL, higher mean depression, and higher somatization scores. The current study found that the anxiety level of patients with the different stages of vitiligo was significantly different. Among the definite cases, the proportion of patients in the progressive and rapid progressive stages was 59.26%, greater than that in the stable stage (40.74%). This finding indicates that patients in the progressive stages may be more worried about the prognosis of their disease, thereby increasing their mental stress.

6.3 Recommendations for further research

This study was conducted at a single dermatology hospital, and the participants may not have been representative of all types of patients with vitiligo in society. However, this study was conducted at a single tertiary dermatology center, which may limit the generalizability of the findings. These factors may have reduced the sampling bias significantly.

In recent years, person-centred care is increasingly advocated as a model of care, which is particularly important in the dermatology. This study can help dermatologic specialists identify patients with vitiligo who are more likely to have negative emotions such as anxiety and depression, and whose quality of life is more likely to be affected. The dermatologic specialists can provide more effective advice, according to the results of this study, to release the psychological pressure and change their lifestyle, thus improving the QoL of such patients.

7. CONCLUSIONS

The present study results revealed that marital status, gender, smoking status, SUL-behaviors, and anxiety levels were the main factors influencing the QoL of patients with vitiligo. Furthermore, higher education levels and facial white spots were associated with higher anxiety levels. Thus, Special attention should be paid to married, female, highly educated, skin lesions on the face, being in the progressive stage of vitiligo patients to provide them with targeted recommendations for improving their psychological status and QoL. In addition, patients with vitiligo should be advised to refrain from smoking and ensure adequate sleep with excellent sleep quality. Therefore, this study brings a distinctive perspective to improve the overall nursing service level, and psychosocial care is emphasized in this research.

DECLARATIONS

Ethical considerations

This study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. The research protocol was reviewed and approved by the Medical Ethics Committee of the Dermatology Hospital of Southern Medical University (Approval No. 2022036, dated May 9, 2022).

Consent to participate

Verbal and written informed consent were obtained from all individual participants included in the study before they completed the questionnaires.

Consent to publish

Not applicable

Data availability

The data that support the findings of this study are not publicly available due to the sensitive nature of patient health information and restrictions imposed by the institutional ethics committee. Anonymized data may be available from the corresponding author upon reasonable request and with appropriate institutional ethics approval.

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Declaration of generative AI and AI - assisted technologies in the manuscript preparation process

Not applicable

Author Contribution

Han Liu was responsible for determining the research topic, designing the research plan, conducting data analysis and writing the first draft of the paper. Mudiao Chen provided valuable guidance for article writing. Jiyu Li, Miao Qu, Xiuyun Huang, Yinying Rao, Xingping Quan, and Jinzhu Yang sent the questionnaires to the prospective patients and performed data collection. Tianqi Chen participated in data analysis and final proofreading. Yongbin Qu refined the design of the study and revised the article critically.

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Figures

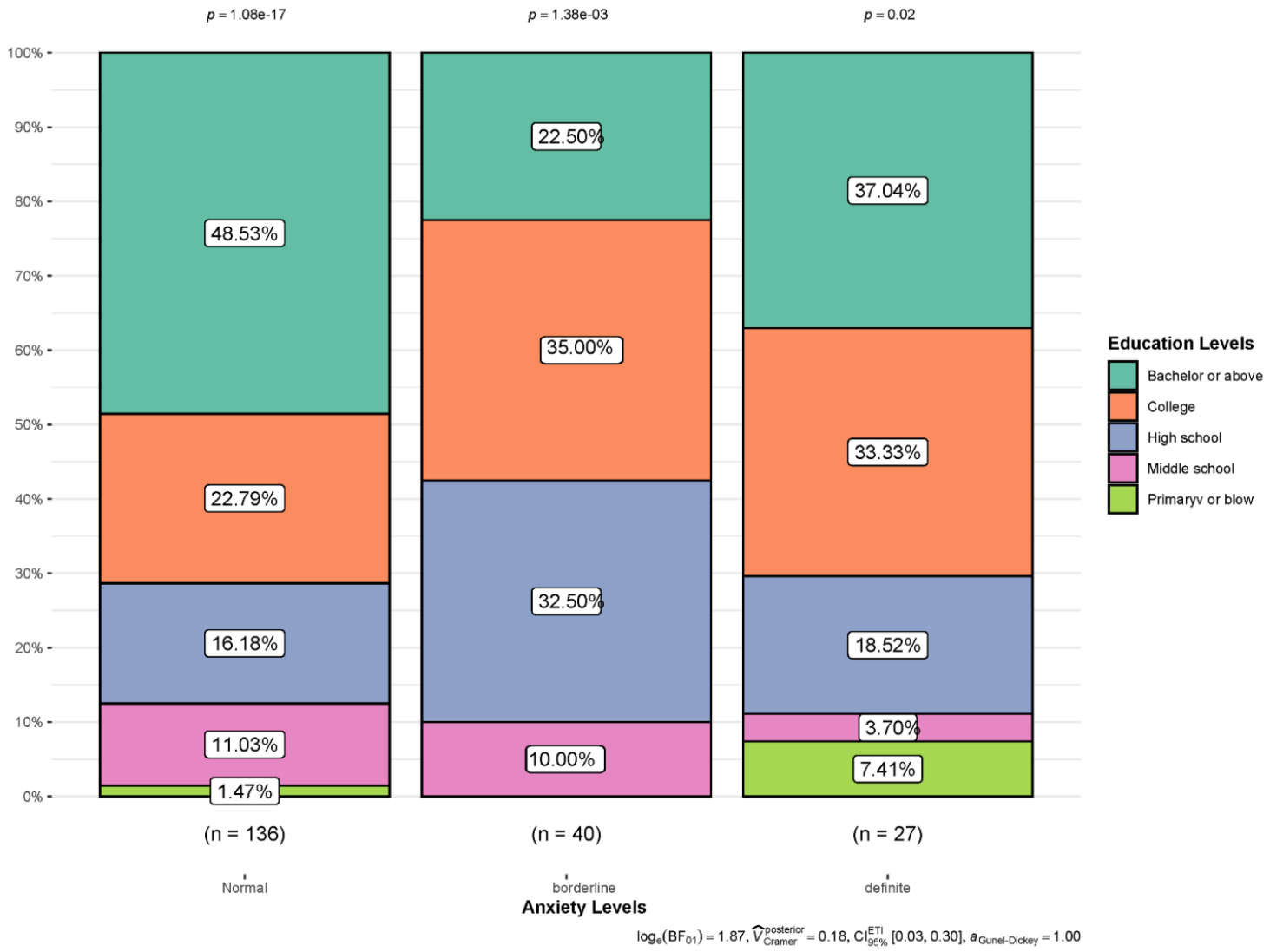


Figure 1

The distribution of anxiety levels in different education levels.

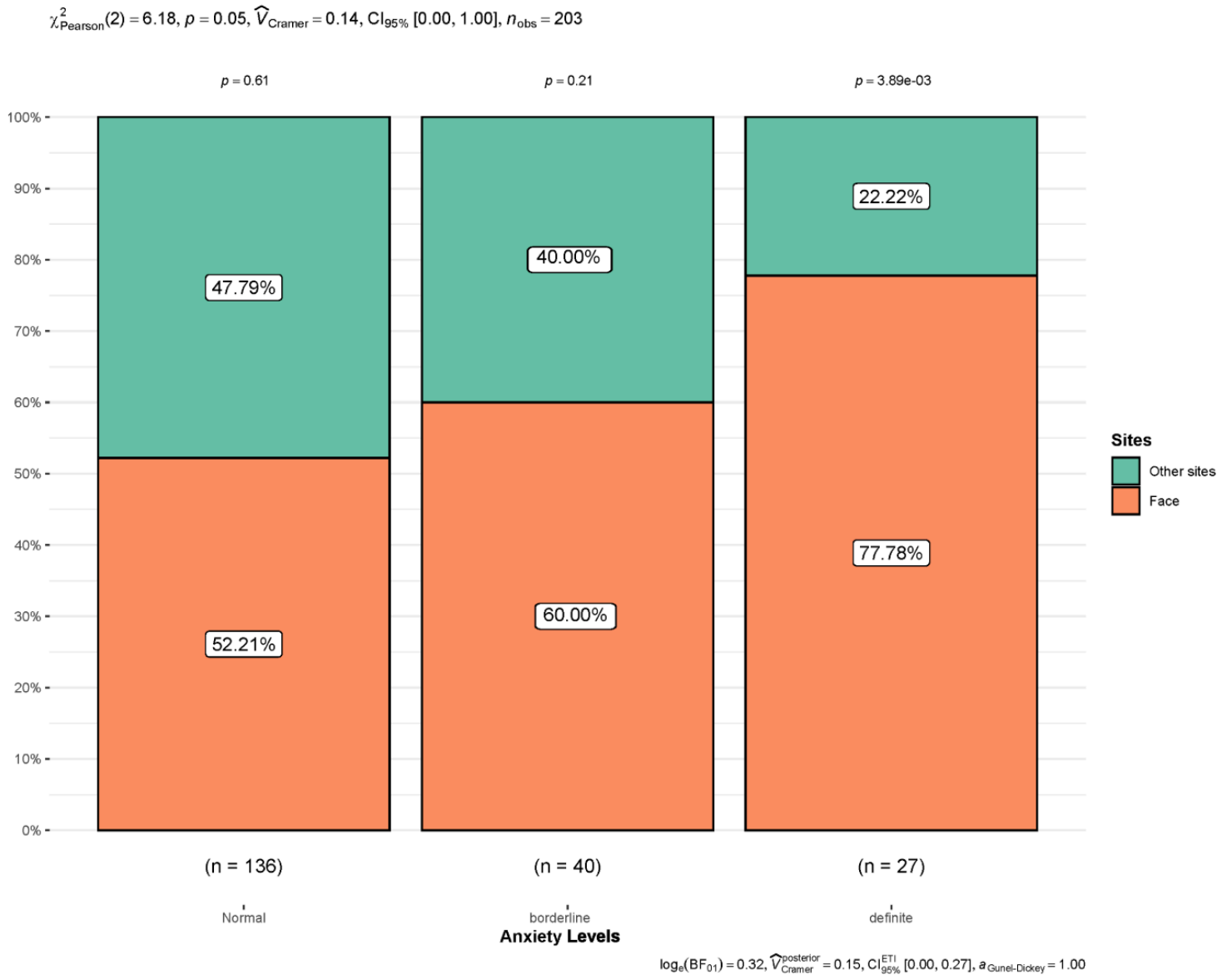


Figure 2

The distribution of anxiety levels in different sites.

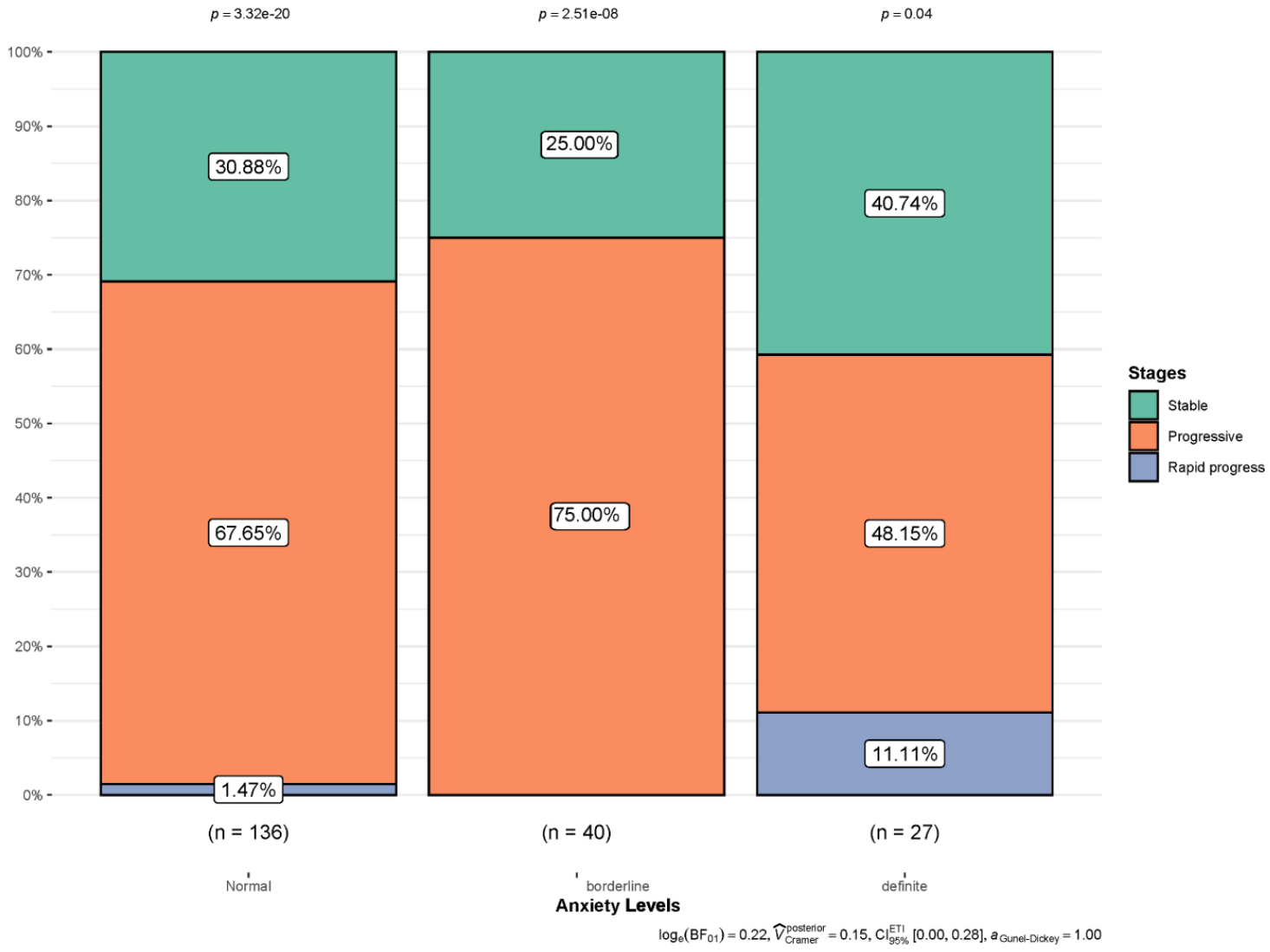


Figure 3

The distribution of anxiety levels in different stages.