



Resilience, self-efficacy, social support, and quality of life in patients with skin defects of the lower extremity after flap transplantation

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Background: Lower extremity trauma is one of the most common emergency presentations. It may cause skin and muscle tissue defects, and in severe cases, it may also be accompanied by bone, tendon, and neurovascular exposure. Pedicled flap transfer is the most important treatment for this type of lower extremity trauma. The purpose of the study is to investigate the relevant factors affecting resilience and provide a theoretical basis of improving resilience in patients after skin flap transplantation.

Methods: In this study, the convenience sampling method was used to conduct a questionnaire survey on patients with skin defects of the lower extremity after flap transplantation. The patient underwent inpatient surgery in the First Affiliated Hospital of Soochow University from January 2018 to June 2020. This study investigated the current status of resilience, self-efficacy, social support, and quality of life in patients with skin defects of the lower extremity after flap transplantation. The correlation between resilience, self-efficacy, social support, and quality of life were examined.

Results: The score for self-efficacy was positively correlated with the score for social support ($P < 0.05$). The score for quality of life was positively correlated with the self-efficacy score and the score for social support ($P < 0.05$). Resilience level was affected by age, marital status, self-efficacy, social support, and quality of life ($P < 0.05$).

Conclusions: Patients who had undergone flap transplantation of the lower limbs reported a low level of resilience. Self-efficacy, social support, and quality of life are important factors that affect the resilience of patients.

Keywords: Lower limb skin defect; flap transplantation; resilience; self-efficacy; social support; quality of life

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Introduction

Skin and soft tissue defects in the lower limbs can be caused by electric shock, traffic accidents, falling from heights, burns, and other similar events. These defects can result in the exposure of nerves, blood vessels, tendons, bone joints, and implanted artificial materials. Early intervention, adequate attention, and appropriate treatment should be

given to skin and soft tissue defects of the lower limbs. The defects should be filled, the wound should be repaired, and as much as possible, the functions of standing, walking, and sports should be restored (1,2). Inadequate treatment of lower limb defects can lead to the formation of osteomyelitis or sinus tracts, and chronic wounds that fail to heal, thereby impeding the normal function of the lower limbs and cause

great psychological and economic burden to the patient (3,4).

Skin flaps are often used clinically to treat skin and soft tissue defects caused by severe trauma. They tend to have a good blood supply and can resist deep tissue infections. At the same time, a moderate amount of tissue is sufficient to increase the wrapping capacity of the bone tissue and the bone plate at the repaired site. Pedicle flaps are tissue which are partially attached to the donor site and as such, it can obtain a better blood supply and greatly reduce the probability of flap crises, thereby increasing the survival rate of the flap. Pedicle flaps may or may not be attached to a major blood vessel.

For most lower limb injuries that are caused by sudden accidents, patients tend to enter an unfamiliar psychological environment due to the acute nature of the trauma. The psychological obstacles they may encounter include the traumatic nature of the surgery itself, concerns regarding the postoperative appearance and function of the limb, the economic costs, and the dependence on caregivers.

Resilience refers to the ability of an individual to make full use of existing resources to adapt and recover rapidly from a difficult situation or when facing adversity or pressure. It is an important predictor of reducing an individual's psychological stress and improving life satisfaction (5,6). Individuals with a high level of psychological flexibility can perceive and access more resources to aid in their recovery. At the same time, they also have the ability to rationally allocate resources to cope with external pressures, thereby promoting the active and healthy growth of the individual.

Self-efficacy is a concept proposed by the American psychologist Bandura in 1986 (7). It refers to a person's self-confidence in performing and persisting in a certain behavioral ability. It is one's self-speculation or self-conjecture about whether they can achieve a certain behavior. Self-efficacy is mainly a personal judgment referring to the self-confidence one has in dealing with various challenges.

Studies have shown that self-efficacy is an important protective factor and predictor of psychological resilience (8). The recovery of lower limb function needs a long time. Due to the long-term problems of the disease, most patients often have physical discomfort, and lack of correct cognition of disease rehabilitation training, which greatly reduces the treatment confidence of patients and ultimately affects the process of disease rehabilitation. The existing literature shows that (9), self-efficacy directly determines people's ability to cope with pressure and difficulties, and has an extremely important role in disease response, control and treatment confidence, that is, those

with higher self-efficacy level have stronger ability to deal with diseases and various symptoms.

Social support refers to the provision of material and spiritual support to individuals from all aspects of society, including couples, relatives, friends, colleagues, social groups, etc. (10). Xiao Shuiyuan, a Chinese scholar (11), believed that individuals can obtain objective support and subjective support in all aspects of society, but only by making full use of these supports can the value of social support be truly utilized. Therefore, according to his research theory, social support is divided into three dimensions: objective support, subjective support, and utilization of support. Social support helps patients improve treatment compliance, gain more knowledge about the disease, reduce psychological pressures, and facilitate disease treatment and rehabilitation.

The World Health Organisation (WHO) defines quality of life (QOL) as "...the experience of individuals in different cultures and value systems with their goals, expectations, standards, and concerns about living conditions. It mainly includes six aspects: physical function, psychological condition, independent ability, social relations, living environment, religious belief and spiritual sustenance" (12). The concept of QOL originated in the United States in the 1930s and was originally used as a sociological indicator. During the 1960s, it was widely used in the social research field. By the end of the 1970s, the medical field carried out extensive research on the QOL to adapt to the changes in the spectrum of diseases, health concepts, and medical models caused by the advancement of medicine. Compared with cure rates and survival rates, the comprehensive evaluation index of the QOL can better reflect the true state of one's physical, mental, and social well-being in the progression of a disease (13).

At home and abroad, there have been few reports examining the resilience, self-efficacy, social support, and the QOL of patients with lower limb skin defect flap transplantations. Therefore, this study investigated the status quo of such patients' resilience, self-efficacy, social support, and QOL. The factors that influence resilience were also analyzed.

We present the following article in accordance with the SURGE reporting checklist (available at <http://dx.doi.org/10.21037/apm-20-2432>).

Methods

Study design

In this study, the convenience sampling method was used to

General information	
Name	
Number	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
Age	
Education	<input type="checkbox"/> Illiterate or primary <input type="checkbox"/> Secondary or higher
Marital status	<input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed
Employed	<input type="checkbox"/> Yes <input type="checkbox"/> No, housewives or retired
Family monthly income per capita	
Lower limb fracture and dislocation	<input type="checkbox"/> Yes <input type="checkbox"/> No
Injured site	<input type="checkbox"/> Calf telemetry <input type="checkbox"/> Ankle <input type="checkbox"/> Heel <input type="checkbox"/> Instep <input type="checkbox"/> Sole

Figure 1 Questionnaire (general information).

conduct a questionnaire survey on patients with skin defects of the lower extremity after flap transplantation. The patient underwent inpatient surgery in the First Affiliated Hospital of Soochow University from January 2018 to June 2020. Data were collected through face-to-face interviews conducted by an investigator. Patients over the age of 18 years presenting with skin and soft tissue defects ranging from 6 cm × 15 cm to 13 cm × 28 cm, clear consciousness, and normal language skills were included in this study. The exclusion criteria were as follows: patients with a history or a family history of mental illness; patients with vision, hearing, and mental retardation; patients with impaired consciousness or impaired communication skills; and patients with severe primary diseases of the heart, brain, liver, kidney or hematopoietic system. Ambiguous answers in the survey were eliminated. All participants volunteered for this study and provided informed consent. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This study was approved by the ethics committee of the First Affiliated Hospital of Soochow University ([2018] 0175).

Estimation of sample size

For the cross-sectional survey, the Kendall's sample size calculation was used to estimate sample size, with the sample size being 5–10 times the number of variables. The Connor-Davidson Resilience Scale (CD-RISC) with 25

items was used in this study and therefore, the sample size should be 125–250. Considering possible missing samples and invalid questionnaires, the sample size was expanded by a further 10%. Therefore, the sample size should be between 138–275. For this study, the final sample size was determined to be 200 cases.

General information survey questionnaire

The general questionnaire was designed in accordance with the purpose and content of the research, and included demographic sociological data (such as gender, age, education level, marital status, family monthly income, medical expenses payment method, etc.) and disease-related data (such as history of fractures, injury sites, etc.) (Figure 1).

The CD-RISC

The CD-RISC scale was compiled by Connor and Davidson (14) in 2003 and is now widely used in the general population and in clinical settings. It includes 25 items covering 5 dimensions including competence, instincts, tolerance of negative affect, positive acceptance of change, ability of control and spiritual influences. The Cronbach's α coefficient of the CD-RISC scale is 0.89, and the test-retest reliability is 0.87 (14,15). In 2007, Yu *et al.* (16) translated and adapted this scale for a Chinese population. Yu's version included three dimensions of tenacity, optimism, and self-improvement, with a total of 25 items. The Likert 5-level scoring method was used as follows: 0 points = never, 1 point = rarely, 2 points = sometimes, 3 points = often, 4 points = almost always. The total possible score is 100 points, and patients with high scores from this questionnaire also have high levels of mental flexibility. This Chinese version has a Cronbach's α value of 0.91 (16), and has been widely used in clinical practice in China (Figure 2).

The General Self-Efficacy Scale (GSES)

This study used the Chinese version of the GSES single-dimensional scale translated by Wang *et al.* (17), with 10 items in total. Using Likert's 4-level scoring (1 = not at all correct, 2 = somewhat correct, 3 = mostly correct, 4 = completely correct), patients answered the questionnaire based on their actual situation. The scale scores range from 10–40 points. Patients with high scores from this questionnaire also have high levels of self-efficacy. Patients with a score of less than 20 were classified as having low

CD-RISC					
Entry	Not at all confident				Completely confident
1. I can adapt to change	0	1	2	3	4
2. I have a close, secure relationship.	0	1	2	3	4
3. Sometimes, fate or God can help me.	0	1	2	3	4
4. No matter what happens, I can cope with it.	0	1	2	3	4
5. Success in the past gives me confidence to face challenges.	0	1	2	3	4
6. I can see the humorous side of things.	0	1	2	3	4
7. Coping with pressure makes me feel powerful	0	1	2	3	4
8. After experiencing difficulty or illness, I tend to recover quickly.	0	1	2	3	4
9. There is always a reason why things happen.	0	1	2	3	4
10. No matter what the result is, I will try my best.	0	1	2	3	4
11. I can achieve my goal.	0	1	2	3	4
12. When things look hopeless, I don't give up easily.	0	1	2	3	4
13. I know where to go for help.	0	1	2	3	4
14. Under pressure, I can focus and think clearly.	0	1	2	3	4
15. I like to take the lead in solving problems.	0	1	2	3	4
16. I will not be discouraged by failure.	0	1	2	3	4
17. I think I am a strong man.	0	1	2	3	4
18. I can make unusual or difficult decisions.	0	1	2	3	4
19. I can handle unhappiness.	0	1	2	3	4
20. I have to act on my hunch.	0	1	2	3	4
21. I have a strong sense of purpose.	0	1	2	3	4
22. I feel in control of my life.	0	1	2	3	4
23. I work hard to achieve my goal.	0	1	2	3	4
24. I like challenges.	0	1	2	3	4
25. I am proud of my achievements.	0	1	2	3	4

Figure 2 Questionnaire (CD-RISC).

self-efficacy. The level of self-efficacy was considered medium if patients scored 20–30 points, and high if they scored more than 30 point. The Cronbach's α value for this scale was 0.87, the test-retest reliability was 0.89, and the reliability and validity were good (Figure 3).

The Social Support Rating Scale (SSRS)

Compiled by Chinese scholar Xiao Sy (11), the SSRS is currently the most commonly used scale for evaluating the level of social support. The scale includes 10 items, divided into 3 dimensions: subjective support, objective support, and support utilization. The total possible score is 66 points. patients with high scores from this questionnaire also have high levels of social support. The specific evaluation criteria were as follows: 22 points or less indicated a low level of support, 23–44 points indicated a medium level of support, and 45–66 points indicated a high level of support (18). The Cronbach's α value of the scale was 0.91 (Figure 4).

WHO Quality of Life-BREF (WHOQOL-BREF)

QOL was assessed using the WHOQOL-BREF scale (19) which was developed in conjunction with more than 20

countries and regions worldwide, and is generally applicable to the global population. The WHOQOL-BREF has four dimensions: physiological, psychological, social relations, and environmental, with a total of 26 items. In addition, two independent items involving the subjective evaluation of one's own quality of life and general health were added to enable cross-country and cross-cultural international comparability. The WHOQOL-BREF scale has good internal consistency, good discriminative validity and structural validity. The scale selected in this study had 25 items, and the internal consistency was good with a Cronbach's α value of 0.910 (Figure 5).

Statistical analysis

The Epidata3.1 software was used for data entry and SPSS 22.0 software was used for statistical analysis. Data were expressed as mean \pm standard deviation, or frequency and percentage. Data was compared using *t*-test and one-way analysis of variance. Pearson correlation analysis was used to show the relationship between psychological flexibility, coping style, and QOL. Multiple stepwise linear regression analyses were used to explore the factors influencing QOL ($\alpha < 0.05$).

GSES				
Entry	Not at all confident			Completely confident
1. If I try my best, I can always solve problems.	1	2	3	4
2. Even though others are against me, I still have a way to get what I want.	1	2	3	4
3. It's easy for me to stick to my ideals and achieve my goals.	1	2	3	4
4. I am confident that I can deal with any unexpected things effectively.	1	2	3	4
5. With my intelligence, I can cope with unexpected situations.	1	2	3	4
6. If I make the necessary efforts, I will be able to solve most of the problems.	1	2	3	4
7. I can face difficulties calmly because I can rely on my ability to deal with problems.	1	2	3	4
8. When faced with a difficult problem, I can usually find several solutions.	1	2	3	4
9. When I'm in trouble, I usually think of ways to deal with it.	1	2	3	4
10. No matter what happens to me, I can handle it.	1	2	3	4

Figure 3 Questionnaire (GSES).

Results

General information

In this study, 200 questionnaires were distributed in total, and 187 valid questionnaires were returned, the effective rate was 93.5% (Table 1).

Resilience analysis

The resilience survey showed that the total psychological elasticity score of patients after skin defect flap transplantation in the lower limbs was 66.78 ± 14.21 , and the three dimensions of toughness, self-improvement, and optimism scored 34.71 ± 9.87 , 21.52 ± 6.66 , and 9.55 ± 2.34 , respectively (Table 2).

Self-efficacy analysis

The general self-efficacy scale used in this study ranged from 10 to 40 points. Patients' scores of self-efficacy ranged from 12 to 39 points, and the average score is 29.48 ± 4.59 points.

Social support analysis

The social support survey revealed that out of a possible 66 points, the patients in this study scored a total of 42.07 ± 8.56 points. The scores for each dimension were as follows: 9.99 ± 2.46 points for objective support, 23.98 ± 4.21 points for subjective support, and 8.10 ± 1.49 points for support utilization (Table 3).

QOL analysis

The WHOQOL-BREF scoring system used in this study ranges from 25 to 125 points. Patients with lower limb flap transplantation scored their QOL between 45–115 points, with an average score of 86.90 ± 16.82 points.

The influence of general patient characteristics on the resilience of patients

This study demonstrated that only age and marital status had a significant effect on the psychological resilience scores of patients with skin defect flap transplantation of the lower limbs ($P < 0.05$; Table 1). Gender, education level, occupation, family income, fracture, and site of injury showed no statistically significant differences in the psychological elasticity scores ($P > 0.05$; Table 1).

Correlation analysis between self-efficacy, social support, QOL, and resilience

Pearson correlation analyses were performed for patients with skin defect flap transplants. The results demonstrated that the patient's self-efficacy score was positively correlated with social support, QOL, and resilience ($P < 0.05$; Table 4). The patient's social support was correlated with the QOL score and resilience score. Furthermore, the QOL score as correlated with the resilience score ($P < 0.05$). Therefore, there was a significant positive correlation between the patient's self-efficacy, social support, QOL, and psychological resilience ($P < 0.05$; Table 4).

SSRS
1. How many close friends from whom can you get support and help? A. none B. 1-2 C. 3-5 D. 6 or more
2. In the past year, you have:
(1) Stay away from family and live in a single room.
(2) Accommodation is constantly changing and most of the time with strangers.
(3) Live with classmates, colleagues or friends.
(4) Live with your family.
3. You and your neighbors:
(1) They never care about each other, they are just nodding friends.
(2) May be a little concerned about difficulties.
(3) Some neighbors are very concerned about you.
(4) Most of the neighbors care about you.
4. You and colleagues:
(1) They never care about each other, they are just nodding friends.
(2) May be a little concerned about difficulties.
(3) Some colleagues are very concerned about you.
(4) Most colleagues care about you.
5. Support and care from family members
1. Husband and wife (lover)
A. there is no general support
2. Parents
A. there is no general support
3. Children
A. there is no general support
4. Brothers and sisters
A. there is no general support
5. Other members
A. there is no general support
6. In the past, when you were in a difficult situation, the sources of financial support and help to solve practical problems were as follows:
(1) No source.
(2) The following sources: (optional)
A. Spouse; B. other family members; C. relatives; D. friends; E. colleagues; F. work unit; G. official or semi official organizations such as the party, league and trade union; H. non official organizations such as religious and social groups; I. others (please list)
7. In the past, the sources of comfort and concern you received in case of emergency include:
(1) No source.
(2) The following sources (optional)
A. Spouse; B. other family members; C. friends; D. relatives; E. colleagues; F. work unit; G. official or semi official organizations such as the party, league and trade union; H. non official organizations such as religious and social groups; I. others (please list)
8. The way to talk when you are in trouble:
(1) Never tell anyone
(2) Only to 1-2 people who are very close to each other.
(3) If a friend asks, you will say so.
(4) Take the initiative to tell your troubles to get support and understanding.
9. How to ask for help when you are in trouble:
(1) Rely on yourself and don't accept help from others.
(2) Rarely ask for help.
(3) Sometimes ask for help.
(4) In case of difficulties, they often ask for help from family members, relatives and organizations.
10. For activities organized by organizations (such as party and League organizations, religious organizations, trade unions, student unions, etc.), you:
(1) Never attend
(2) Occasionally
(3) Regular attendance
(4) Active participation and active activities.

Figure 4 Questionnaire (SSRS).

Regression analyses of the factors influencing a patient's resilience

Patient characteristics that affected the resilience score (Table 1), and factors that showed a correlation with resilience (Table 4) were used as independent variables in the regression analyses. The patient's psychological resilience

score was used as the dependent variable, and multiple stepwise regression analyses were performed. The results demonstrated that a patient's resilience level was affected by age, marital status, self-efficacy, social support, and QOL. The coefficient of determination was adjusted such that $R^2=0.746$, $F=77.452$, and $P<0.05$ (Table 5).

WHOQOL-BREF									
	Very Disappointed	Disappointed	Neither disappointed nor good	Good	Very good				
1	1	2	3	4	5				
	Very Disappointed	Fairly Disappointed	Neither Disappointed Pleased nor Disappointed	Pleased	Very Pleased				
2	1	2	3	4	5				
	How pleased are you with your health?								
The following questions ask how many things you have experienced in the past two weeks.									
	Not at all	A Little	A Moderate amount	Quite a lot	An Extreme amount				
3	1	2	3	4	5				
	To what extent do you feel physical pain is preventing you from doing what you need to do?								
4	1	2	3	4	5				
	How much medication do you need in your daily life?								
5	1	2	3	4	5				
	How much do you enjoy your life?								
6	1	2	3	4	5				
	How meaningful do you think your life is?								
	Not at all	Slightly	Moderately	Very	Extremely				
7	1	2	3	4	5				
	Can you concentrate?								
8	1	2	3	4	5				
	How safe do you feel in your daily life?								
9	1	2	3	4	5				
	How healthy is your physical environment?								
	Not at all	Slightly	Somewhat	To a great extent	Completely				
10	1	2	3	4	5				
	Do you have enough energy for your daily life?								
11	1	2	3	4	5				
	Do you accept the way you look?								
12	1	2	3	4	5				
	Do you have enough money to meet your needs?								
13	1	2	3	4	5				
	How much information do you need in your daily life?								
14	1	2	3	4	5				
	To what extent do you have opportunities for leisure activities?								
	Not at all	Slightly	Moderately	Very	Extremely				
15	1	2	3	4	5				
	How is your physical activity?								
The following question asks you to say how satisfied you have been with all aspects of your life over the past two weeks.									
	Very Disappointed	Fairly Disappointed	Neither Pleased nor Disappointed	Pleased	Very Pleased				
16	1	2	3	4	5				
	Are you pleased with your sleep?								
17	1	2	3	4	5				
	Are you pleased with your abilities in daily life?								
18	1	2	3	4	5				
	How pleased are you with your ability to do your job								
19	1	2	3	4	5				
	How pleased are you with yourself?								
20	1	2	3	4	5				
	How pleased are you with your personal relationship?								
21	1	2	3	4	5				
	How pleased are you with your sex life?								
22	1	2	3	4	5				
	How pleased are you with your friend's support?								
23	1	2	3	4	5				
	Are you pleased with your living conditions?								
24	1	2	3	4	5				
	How pleased are you with your access to health care?								
25	1	2	3	4	5				
	How pleased are you with transportation?								

Figure 5 Questionnaire (WHOQOL-BREF).

Table 1 Single factor analyses examining the relationship between general characteristics for patient with flap transplantation of the lower limb and psychological resilience

Variable	N (%)	Score (M ± SD)	F/t	P
Gender			-0.801	0.432
Male	119 (63.64)	66.47±14.34		
Female	68 (36.36)	67.33±13.56		
Age			4.872	<0.001
18–30	25 (13.37)	75.62±7.32		
31–40	62 (33.16)	69.50±15.44		
41–50	56 (29.95)	61.76±13.65		
51–60	22 (11.76)	61.18±9.04		
>60	22 (11.76)	67.45±8.62		
Education			0.593	0.528
Illiterate or primary	43 (22.99)	67.14±14.89		
Secondary or higher	144 (77.01)	66.67±14.21		
Marital status			2.763	0.032
Single	12 (6.42)	65.79±15.32		
Married	153 (81.82)	67.56±14.15		
Divorced	12 (6.42)	58.87±14.73		
Widowed	10 (5.35)	65.53±15.66		
Employed			0.692	0.415
Yes	147 (78.61)	66.89±14.76		
No, housewives or retired	40 (21.39)	66.38±14.33		
Family monthly income per capita			1.43	0.223
0–999	30 (16.04)	70.03±12.89		
1,000–2,999	76 (40.64)	65.36±16.13		
3,000–4,999	44 (23.53)	66.71±14.14		
>5,000	37 (19.79)	67.14±14.32		
Lower limb fracture and dislocation			0.489	0.653
Yes	23 (12.30)	66.76±14.43		
No	164 (87.70)	66.78±14.22		
Injured site			0.723	0.572
Calf telemetry	53 (28.34)	67.02		
Ankle	46 (24.60)	66.12		
Heel	60 (32.09)	67.73		
Instep	17 (9.09)	63.40		
Sole	11 (5.88)	68.42		

N, number of patients; M ± SD, mean ± standard deviation; F/t: F value /T value.

Discussion

The overall level of psychological elasticity in patients after skin defect flap transplantation of the lower limbs was low. This study found that the patient's resilience score was 66.78 ± 14.21 points, which was lower than the resilience level of the general population in the United States and China (80.40 ± 12.80 points and 70.50 ± 13.48 points, respectively) (14,20).

In the study cohort, self-efficacy, social support, QOL, and psychological resilience were all positively correlated. This suggested that with the improvement of self-efficacy, social support, and QOL, the psychological resilience score may also increase. Further regression analysis found that self-efficacy, subjective support, and coping styles all have an impact on the psychological resilience score, and the

degree of fit was high. The above effects may explain 74.6% of the variations in psychological resilience.

Clinical medical staff should provide appropriate support and intervention measures, and use self-efficacy, social support, and QOL as indicators to monitor patients after the interventions to better improve their psychological flexibility.

Due to the acute nature of lower limb trauma, patients may enter an unfamiliar psychological state. The operation itself may manifest as anxiety, depression, and fear, and postoperative changes in the appearance and function of the lower limbs and high economic costs, can add to the psychological strain. In some cases, the meticulous caregiver may inadvertently produce a comprehensive psychology of dependence and cause artificial self-care defects, both of which are not conducive to the recovery of the lower limb function. Medical staff should focus on the psychological state of patients, fully understanding their psychological appeals, and provide targeted and personalized psychological counseling and health education, so as to improve the psychological flexibility of patients and maintain good mental health. Even after the wound itself has healed, the patient will undergo a slow recovery to regain long-term function (21). Rehabilitation is an active and conscious activity. Different types of psychological barrier can affect the rehabilitation efforts. Medical staff should provide patients with the necessary knowledge and technical support, and actively use various social support systems to enhance the self-efficacy of patients. According to the patient's individual condition and the stage of the disease, medical personnel should actively evaluate and screen the factors that affect self-efficacy, and formulate individualized intervention plans, improve the continuity of care, and enhance patient confidence in coping with and managing the disease. Finally, the nursing process should not be limited to the detection of physiological indicators. According to the different causes of anxiety of patients at different stages, nurses should timely tell patients about the changes of lower limb shape and the

Table 2 Total psychological resilience scores of the patients and the scores for each dimension

Variable	M (SD)	Range
Tough	34.71 (12.87)	12–48
Self-improvement	21.52 (6.66)	12–29
Optimism	9.55 (5.34)	4–14
Total	66.78 (14.21)	34–88

N, number of patients; M, mean; SD, standard deviation.

Table 3 The patient's total scores for social support status and the scores of the individual dimensions

Variable	M (SD)	Range
Subjective support	23.98 (4.21)	11–32
Objective support	9.99 (2.46)	4–17
Support utilization	8.10 (1.49)	5–11
Total	42.07 (8.56)	26–54

N, number of patients; M, mean; SD, standard deviation.

Table 4 Correlation analysis the patients' social support, self-efficacy, and psychological resilience

Variable	Self-efficacy	Social support	Quality of life	Resilience
Self-efficacy	1			
Social support	0.481*	1		
Quality of life	0.426*	0.533*	1	
Resilience	0.758*	0.667*	0.678*	1

* $P < 0.05$.

Table 5 Regression analyses of the factors influencing the patient's psychological resilience

Variable	B	SE	β	t	P
Constant	42.146	4.337	–	9.141	0.000
Age	6.973	0.872	0.415	7.026	0.000
Marital status	3.763	0.712	0.267	4.463	0.000
Self-efficacy	0.432	0.151	0.190	3.14	0.003
Social support	0.221	0.076	0.163	2.468	0.009
Quality of life	1.547	0.332	0.215	3.843	0.000

F=77.452, R²=0.756; adjusted R²=0.746, P<0.05.

long process of rehabilitation of lower limb function, so that patients can have a clear understanding of the treatment and rehabilitation process they are facing in the future, have sufficient psychological preparation for long-term lower limb functional exercise, and improve patients' interest and desire for life, To reduce the anxiety and fear of patients. Attention should be given to the evaluation of the patient's psychological state. Through the formulation of systematic and scientific intervention programs, the patient's psychological state should be improved, and the patient should adopt a positive response to the disease. Only by maintaining a good mental state and establishing correct rehabilitation beliefs can there be active participation in rehabilitation behaviors, thereby obtaining ideal function of the limbs and improving the QOL.

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Footnote

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aspects of the work and for ensuring that questions relating to the accuracy or completeness of any part of the work are properly investigated and resolved. All participants volunteered for this study and provided informed consent. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This study was approved by the ethics committee of the First Affiliated Hospital of Soochow University ([2018] 0175).

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