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The Application Value of Phased Nursing Model in Patients with Melasma Undergoing Laser Treatment

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Abstract: *Objective*: To analyze the application value of phased nursing care in patients undergoing laser treatment for melasma. *Methods*: A total of 68 patients with melasma who received laser treatment at the Dermatology Department of Yichang Central People's Hospital from June 2023 to June 2025 were selected as the study subjects. According to differences in nursing plans, patients were randomly divided into two groups, with 34 patients in each group: the control group received routine nursing care, while the observation group received phased nursing care. The wound healing, negative emotions, and self-efficacy of the two groups before and after nursing were compared. *Results:* The duration of erythema in the observation group was shorter than that in the control group, and the area of pigmentation was smaller than that in the control group ($p < 0.05$). After nursing, the SAS and SDS scores of the observation group were lower than those of the control group ($p < 0.05$), and the GSES scores of the observation group were higher than those of the control group ($p < 0.05$). *Conclusion:* Phased nursing care can significantly improve wound healing in patients undergoing laser treatment for melasma, reduce negative emotions, and enhance self-efficacy. Keywords: Stepwise health education; Community type 2 diabetes; Blood glucose; Disease knowledge awareness rate

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1. Introduction

Melasma, a commonly acquired pigmented skin disorder in clinical practice, typically presents as symmetric light brown to dark brown patches on exposed areas such as the cheeks, zygomatic regions, and forehead. Its pathogenesis is complex and is closely associated with genetic susceptibility, endocrine disorders, ultraviolet exposure, psychological stress, and other factors [1]. Although the condition does not cause significant physical discomfort, it severely affects facial appearance, often leading to negative emotions such as anxiety and low self-esteem, thereby reducing quality of life, and has become a major skin concern for young and middle-aged women [2]. With the rapid development of medical aesthetic technology, laser therapy, due to its strong targeting ability and definite efficacy, has become the preferred clinical treatment for melasma. It works by selectively destroying melanocytes and melanosomes through photothermal effects, promoting the metabolism and clearance of pigment

particles, significantly improving the color and area of lesions [3]. However, laser treatment can temporarily damage the skin barrier, causing adverse reactions such as redness, swelling, burning, and scabbing. The risks of postoperative pigmentation and recurrence also remain, which not only affect treatment outcomes but may lower patient adherence [4]. Therefore, providing scientific and systematic nursing interventions throughout laser treatment is of great significance for promoting skin repair, reducing complications, and consolidating treatment effects.

The traditional clinical nursing model largely focuses on postoperative symptomatic care and lacks targeted attention to the physiological and psychological needs of patients at different stages, before, during, and after treatment. As a result, nursing measures are fragmented and homogeneous, making it difficult to meet individualized recovery needs. The staged nursing model, as a new nursing concept, emphasizes aligning with the disease treatment process and, based on patients' pathological and physiological characteristics, treatment goals, and nursing priorities at different stages, develops phased and progressive nursing plans, achieving precise and continuous nursing interventions [5]. The application of this model in areas such as surgical care and chronic disease management has proven effective in improving nursing quality and patient outcomes.

Based on this, this study selected 68 patients with melasma as research subjects to analyze the application effect of the staged nursing model in patients undergoing laser treatment for melasma, and the findings are reported as follows.

2. Objects and methods

2.1. Research subjects

A total of 68 patients with melasma who received laser treatment in the Department of Dermatology at Yichang Central People's Hospital from June 2023 to June 2025 were selected as the research subjects. According to differences in nursing plans, all patients were randomly divided into a control group and an observation group, with 34 cases in each group. There was no significant difference in clinical data between the two groups ($p > 0.05$), detailed data can be referred to in **Table 1**.

Table 1. Comparison of clinical data of the two groups

Group	Number of cases	Male/Female (n)	Average age (years)	Average disease duration (years)	Educational level		
					Elementary school	Junior high and high school	College degree or above
Control group	34	4/30	35.59 ± 4.41	7.11 ± 1.17	10	14	10
Observation group	34	3/31	34.90 ± 4.62	7.20 ± 1.35	12	13	9
χ^2/t value		0.159	0.630	0.294		0.061	
p value		0.690	0.531	0.770		0.804	

2.2. Inclusion, exclusion, and elimination criteria

2.2.1. Inclusion criteria

(1) Meet the diagnostic requirements for melasma as outlined in the "Interpretation of Domestic and International Guidelines for Melasma" [6];

(2) Predominantly female population, often occurring after puberty, with symptoms showing seasonal fluctuations, worsening in summer and easing in winter;

(3) Aged between 18 and 60 years;

(4) The study has received approval from the hospital's ethics committee, and all patients provided informed consent and signed a written consent form.

2.2.2. Exclusion criteria

(1) Facial deformities;
(2) History of photosensitive diseases or known photosensitivity;
(3) Women who are pregnant or breastfeeding;
(4) Individuals prone to keloid formation.

2.3. Research methods

Patients in the control group received routine care, which included health guidance before surgery, dietary advice, surgical precautions, and health education, clear notification of potential treatment risks, and reminders to return for follow-up promptly if postoperative complications occur. Patients in the observation group received staged care.

2.3.1. Pre-treatment care

After admission, nurses actively communicated with patients, providing one-on-one explanations or group health lectures to systematically introduce the treatment procedures and mechanisms, helping deepen patients' understanding.

2.3.2. During treatment care

Patients were informed that mild pain might occur during the procedure, which is a normal physiological response, helping reduce psychological burden and guiding active cooperation with the treatment.

2.3.3. Post-treatment care

(1) Pain management
Wrap the ice pack in sterile gauze and apply it to the affected area. Ice for 15–20 minutes at a time, once every two hours, and apply hyaluronic acid gel once a day;
(2) Dietary guidance
Based on patients' daily eating habits, a personalized diet plan was developed, recommending a primarily light diet and strictly prohibiting spicy and irritating foods;
(3) Lifestyle guidance
Patients were instructed to clean their face with cool water at 15–18 ℃ in the morning and evening, avoid using irritating cosmetics and various spot-removal products, and were advised to engage in moderate aerobic exercise to improve skin metabolism.

2.4. Observation indicators

(1) Wound healing
The duration of erythema after treatment was recorded for the two patient groups. At 2 months postoperatively, the pigment deposition of patients' wounds were assessed using the ANTER 3D skin imaging analyzer (Ireland), with a focus on recording the area of pigment deposition. This indicator was independently evaluated by two trained researchers, and the mean of their assessments was used as the

statistical value.

(2) Negative emotions

Anxiety and depression were assessed using the Self-Rating Anxiety Scale (SAS) and the Self-Rating Depression Scale (SDS), respectively. Both scales contain 20 items, each scored from 1 to 4. An SAS score ≥ 50 indicates the presence of anxiety, and an SDS score ≥ 53 indicates the presence of depression.

(3) Self-efficacy

The General Self-Efficacy Scale (GSES) was used for evaluation. This scale consists of 10 items with a total score of 40. Higher scores indicate stronger self-efficacy in patients.

2.5. Statistical methods

Data analysis was conducted using SPSS 23.0. For count data, results were presented as percentages (%). Chi-square tests (χ^2 tests) were used to analyze the association between count data across different groups. Measurement data conforming to a normal distribution were presented as ($\overline{x} \pm s$) and differences between groups were evaluated using t-tests. In all statistical analyses, $p < 0.05$ was considered statistically significant.

3. Results

3.1. Comparison of wound healing between the two patient groups

The results showed that the erythema duration in the observation group was shorter than that in the control group, and the area of pigmentation was smaller than that in the control group ($p < 0.05$), see **Table 2**.

Table 2. Comparison of wound healing between the two groups of patients ($\overline{x} \pm s$)

Group	Number of cases	Duration of erythema (days)	Pigmentation area (cm^2)
Control group	34	7.58 ± 1.20	2.53 ± 0.23
Observation group	34	6.88 ± 0.91	2.41 ± 0.25
t value		2.710	2.060
p value		0.009	0.043

3.2. Comparison of negative emotions between the two patient groups

The results showed that after nursing care, the SAS and SDS scores of the observation group were lower than those of the control group ($p < 0.05$).

Table 3. Comparison of negative emotions between the two patient groups (point, $\overline{x} \pm s$)

Group	Number of cases	SAS Score		SDS Score	
		Before care	After care	Before care	After care
Control group	34	57.61 ± 5.54	52.20 ± 4.89*	58.22 ± 5.02	54.78 ± 5.62*
Observation group	34	56.89 ± 5.43	45.26 ± 4.17*	58.36 ± 5.21	46.71 ± 5.38*
t value		0.541	6.297	0.113	6.048
p value		0.590	0.000	0.911	0.000

Note: Compared with before nursing, *$p < 0.05$

3.3. Comparison of self-efficacy between the two groups of patients

The results showed that after nursing care, the GSES scores of the observation group were higher than those of the control group ($p < 0.05$).

Table 4. Comparison of self-efficacy between the two groups of patients (point, $\overline{x} \pm s$)

Group	Number of cases	GSES Score	
		Before care	After care
Control group	34	24.56 ± 3.39	27.61 ± 3.05*
Observation group	34	25.11 ± 3.40	30.66 ± 3.11*
t value		0.668	4.083
p value		0.506	0.000

Note: Compared with before nursing, *$p < 0.05$

4. Discussion

In the observation group, patients experienced shorter durations of erythema and reduced areas of pigmentation, primarily because phased nursing broke away from conventional care and achieved precise intervention for wound repair. Before treatment, nurses provided diversified health education to help patients fully understand the pathophysiological mechanisms underlying skin barrier damage after laser therapy, and clarified the importance of pre-treatment steps such as sun protection and gentle cleansing, thereby reducing triggers like UV exposure and improper care that could worsen pigmentation [7]. This is consistent with the findings of Yu Hong et al. in their study of laser treatment for pigmented disorders, which indicated that preoperative health education increased patients' compliance with sun protection by 47%, and inadequate sun protection is the primary external factor leading to pigmentation [8]. During treatment, creating a quiet and private environment helped reduce sympathetic nervous system excitation caused by patient tension, thereby minimizing the inhibition of local blood circulation by catecholamines and providing a favorable local microenvironment for the metabolic clearance of melanocytes damaged post-laser treatment [9]. Postoperatively, personalized dietary guidance reduced oxidative stress interference with skin repair, while meticulous care measures such as cleansing with cool water at 15–18 ℃ and avoiding irritating products effectively protected the fragile skin barrier and prevented secondary damage [10]. This refined care aligns more closely with the physiological needs of skin repair at different stages, ultimately improving wound healing quality.

After nursing in the observation group, SAS and SDS scores were significantly lower than those in the control group, mainly because phased nursing integrated psychological intervention throughout the entire treatment process. Before treatment, identifying the root causes of negative emotions made psychological interventions more targeted, which aligns with Guo Jie et al.'s research, showing that targeted psychological intervention reduced patients' anxiety scores by 18.3% compared to generalized reassurance [11]. During treatment, patients' treatment-related fears were alleviated in real time, preventing the accumulation and amplification of anxiety. In the postoperative follow-up phase, nurses continuously monitored wound recovery, promptly addressed concerns, and reinforced treatment confidence. In contrast, conventional nursing lacks dynamic tracking of patients' emotional changes, making it difficult to address secondary anxiety caused by wound recovery progress and pigmentation issues, which explains why the improvement in negative emotions in the control group was limited [12].

The GSES scores of the observation group were higher than those of the control group. This is because through comprehensive health guidance and support throughout the entire cycle, patients were helped to develop a sense of control over their treatment and rehabilitation. In contrast, routine care only provides general health guidance before surgery, lacking targeted cultivation of patients' self-management abilities. As a result, patients often do not know how to care for themselves scientifically after surgery and lack continuous support, leading to inadequate self-care behaviors and difficulty in building effective self-management confidence. This also explains why the self-efficacy in the control group showed little improvement [13]. Notably, in this study, the improvement in self-efficacy created a synergistic effect with wound healing and the alleviation of negative emotions. Higher self-efficacy promoted patients' adherence to care measures such as sun protection and dietary control, thereby optimizing wound healing outcomes. The good progress in wound healing and relief of negative emotions further reinforced self-efficacy. This mechanism of mutual promotion is a core advantage of the staged care model over routine care and also provides a new approach for the comprehensive treatment of chronic skin diseases such as melasma.

5. Conclusion

In summary, the staged care model can significantly improve wound healing in patients undergoing laser treatment for melasma, alleviate negative emotions, and enhance self-efficacy, providing a scientifically feasible nursing plan for clinical practice.

Disclosure statement

The author declares no conflict of interest.

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