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ORIGINAL ARTICLE

Retrospective Study

Impact of solution-focused brief therapy and vacuum sealing drainage on mental health of wound care patients

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Abstract

BACKGROUND

Improving mental health is crucial for patients who require wound treatment.

AIM

To analyze the effects of solution-focused brief therapy (SFBT) combined with vacuum sealing drainage on the psychological health of patients undergoing wound treatment, providing a basis for selecting wound treatment protocols.

METHODS

A total of 102 patients undergoing wound treatment were included, with the study period from March 2020 to March 2024. Sex was not a factor, and patients were randomly assigned to two groups of 51 cases each. The control group received negative pressure wound therapy (NPWT), while the experimental group received NPWT plus SFBT. The recovery of wounds, granulation tissue scores, and psychological health levels were compared between the two groups. Statistical analysis was conducted using SPSS Windows software version 26.0 and GraphPad Prism 8.0.

RESULTS

Post-treatment, the levels of high-sensitivity C-reactive protein, white blood cell count, and lactate dehydrogenase in the experimental group were significantly lower than those in the control group ($P < 0.05$). The two groups had no significant difference in granulation tissue scores ($P < 0.05$). The psychological health level in the experimental group was significantly higher than in the control group ($P < 0.05$).

CONCLUSION

The combination of SFBT and NPWT accelerates wound healing, promotes granulation tissue growth, and improves psychological well-being, making it a valuable approach for clinical application.

Key Words: Solution-focused brief therapy; Negative pressure wound therapy; Psychological health; Wound healing; Clinical treatment

Core Tip: Combining solution-focused brief therapy with negative pressure wound therapy can significantly enhance the healing process of wounds, improve psychological well-being, and help patients regain confidence. Solution-focused brief therapy is a brief psychotherapy approach that focuses on the client's strengths and resources, emphasizing the present and future rather than past problems, to help individuals create positive changes and achieve their goals. Negative pressure wound therapy, on the other hand, is a physical therapy method that applies subatmospheric pressure to wounds to promote blood circulation, reduce infection, and accelerate the healing process.

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INTRODUCTION

In recent years, the prevalence of acute and chronic non-healing wounds caused by trauma, burns, and various chronic diseases has been increasing annually. The incidence rate of pressure ulcers is approximately 3%, and approximately 8 million patients have traumatic ulcers yearly. Additionally, the incidence rate of common diabetic foot ulcers in China is about 2%. Promoting wound healing remains one of the most challenging areas in clinical practice[1-3]. Clinical surveys have found that in social interactions, work, and romantic relationships, a healthy and attractive appearance often brings confidence and advantages[4,5]. Wounds affect the patient's appearance and impose a heavy burden on psychological health and quality of life, leading to severe mental health issues over time. At present, negative pressure wound therapy (NPWT) is the primary method for treating wounds, ensuring blood flow to the wound, promoting healing, and efficiently draining, with comprehensive, zero-accumulation effects, which are favored by many patients and physicians [6,7]. However, physical therapy alone does not address the psychological aspect. Therefore, to improve the psychological health of patients further, psychological therapy is needed as an adjunct. Solution-focused brief therapy (SFBT) is a short-term psychological treatment technique centered on goal achievement methods, helping patients solve problems, change adverse behaviors and thinking patterns, adjust negative emotions, and achieve ideal goals[8,9]. However, there are few reports on the impact of SFBT combined with NPWT on the psychological health of patients undergoing wound treatment. Against this background, this study focuses on patients receiving wound treatment as the research participants. SFBT is applied alongside NPWT in the observation group, aiming to provide a basis for comprehensive wound care.

MATERIALS AND METHODS

General data

A total of 102 patients admitted to our hospital for wound treatment from March 2020 to March 2024 were selected. They were grouped using a simple random sampling method, with 51 cases in the control group, comprising 31 men and 20 women; age ranging from 22 to 60 years old (41.25 ± 6.82); and wound area accounting for body surface area (2.22 ± 0.22 cm^2). The observation group also included 51 cases, with 30 men and 21 women aged 21 to 65 years old (42.56 ± 7.02) and wound area accounting for body surface area (2.19 ± 0.11 cm^2). The baseline data of the two groups were compared ($P > 0.05$), indicating statistically significant differences.

Inclusion and exclusion criteria

Inclusion criteria: (1) Wound area ≤ 3% of body surface area; (2) Presence of varying degrees of psychological health issues due to the wound; (3) No contraindications to the treatment plan of this study; and (4) Informed consent obtained from patients and their families.

Exclusion criteria: (1) Actively bleeding wounds; (2) Patients with malignant tumors; (3) Pregnant or lactating women; (4) Patients with immunological diseases or in an immunosuppressed state; (5) Patients from other regions or unable to follow up after discharge; (6) Patients with important organ diseases such as heart, liver, or kidney; (7) Patients who have undergone other treatment methods; and (8) Wounds with eschar necrotic or malignant tissues.

Methods

Both groups underwent bacterial culture of wound secretions and treatment of primary diseases, with local debridement to ensure blood supply to the fresh wound. The control group received vacuum sealing drainage (VSD) treatment. A trauma-negative pressure drainage kit [SAC-A2-D2, SAGE (Xiamen) Medical Technology Co., Ltd.] was used. A disposable VSD negative pressure wound dressing (15 cm × 10 cm) was selected and cut to fit the size and shape of the wound. This ensured complete contact with the entire wound surface after placement. The edges were then sutured and secured to the surrounding healthy skin. A semi-permeable membrane was applied to cover and seal the VSD system and the surrounding healthy skin. The membrane was cut and attached to a drainage suction cup. When an external fixation device was used, the "mesentery method" was applied. This involved wrapping the film around the Steinmann pin sufficiently long before securing it around the wound. Subsequently, the central negative pressure device was connected and adjusted between 0.017 MPa and 0.06 MPa. Continuous, strict monitoring of the negative pressure drainage was conducted, and the drainage tube was flushed with 0.9% sodium chloride solution (Otsuka Pharmaceutical Co., Ltd.). The VSD dressing was replaced after 7 days and removed after 14 days if no abnormalities were observed. If there was still a large amount of necrotic tissue in the wound, pulse flushing was performed. This was followed by negative pressure suction until the condition improved, and then free grafting could be performed - continuous treatment for 14 days.

The observation group applied SFBT therapy to the VSD treatment plan: (1) Team formation: A "SFBT team" was established consisting of one deputy chief physician, three attending physicians, and three nursing staff from the department, with the department head serving as the team leader, and the hospital's psychological counselors were involved in providing special training on "SFBT therapy" to the team members; (2) Plan formulation: This includes describing the problem, constructing goals, exploring exceptions, providing feedback, and evaluating progress; (3) Describing the problem: Preliminary communication with the patient was established to ask about their current most distressing issues, guiding them to describe the problem correctly, and assess the patient's current psychological state through listening, understanding, respect, and acceptance, identifying the critical psychological focus issues; (4) Constructing goals: A positive emotional atmosphere was actively created. The patient's inner needs were understood through "miracle questions" and "scale questions", and stage goals were jointly formulated with the patient. These encompassed "how to adjust adverse emotions", guiding the patient to explore their current efforts, and analyzing the benefits of goal achievement. When patients perform well, timely affirmation and encouragement prompt them to discover their strengths and continue their efforts according to the set goals; (5) Exploring exceptions: Narrative and recalling past positive life experiences. This included their most memorable music, videos, or photos, cherished relationships, memorable work experiences, pleasant travels, and loved ones. The goal was to help patients reflect on past successes in overcoming difficulties, build confidence for the future, and cultivate a sense of responsibility. These methods encouraged patients to actively adapt to role changes and manage negative emotions more effectively; (6) Providing feedback: After the patient completes the stage goal, their psychological health status was asked, such as "After VSD treatment, do you feel your wound has improved?". If the patient answers "improved", continue asking, "How is your current mood? Is it better than before?". This helps patients understand the importance of maintaining a good mood during wound treatment and better tap into their potential, prompting them to cooperate with treatment; and (7) Evaluating progress: Affirm every patient's progress, and when they are in a low mood, encourage them to adjust their emotions by themselves, guiding patients to complete the expected goals. This cycle continues for 14 days.

Observation indicators

Laboratory parameters: Granulation tissue from the center of the wound was harvested from liquid nitrogen and stored in an environment maintained at 2-8 °C. The tissue was then treated with phosphate-buffered saline, followed by homogenization and centrifugation. Enzyme-linked immunosorbent assay was employed to measure the levels of high-sensitivity C-reactive protein (hs-CRP; GILED Biotechnology, China, ID: J21212), white blood cell (WBC) count, and lactate dehydrogenase (LDH; GILED Biotechnology, China, ID: J20956).

Wound granulation score: The attending physician of our department and the director designed the wound granulation scoring method based on relevant authoritative literature. The reliability and validity were tested to be 0.836 and 0.821, respectively. The scoring criteria are: (1) 1 point: The wound surface is dull, the base is concave, granulation tissue grows, and the coverage of the wound is less than 25%; (2) 2 points: The wound surface is light red, the base is relatively flat, and the granulation tissue covers 25%-50%; (3) 3 points: The wound surface is bright red, the base has granular protrusions, granulation tissue grows vigorously, and coverage exceeds 50%; and (4) 4 points: The wound surface is bright red and ruddy, the base is flat without protrusions, granulation tissue grows well, and the coverage rate reaches 100%.

Psychological health level: The "Positive Psychological Capital Questionnaire (PPQ)"[10] was used. This included four dimensions of optimism (42 points), hope (42 points), self-efficacy (49 points), and psychological resilience (49 points), with 28 items, a total score of 182 points. Further, the score was directly proportional to the level of psychological health.

Statistical analysis

All data collected in this study were analyzed using SPSS Windows software version 26.0. The following statistical methods were employed for measurement data that conform to a normal distribution: (1) Data were presented as mean ± SD; (2) Between-group comparisons were conducted using the independent samples *t*-test; (3) Within-group comparisons were conducted using the paired samples *t*-test; (4) Count data were primarily analyzed using the χ^2 test, with results presented as number (*n*) and percentage (%); and (5) Ordinal data were primarily analyzed using the rank sum test, also presented as number (*n*) and percentage (%). The baseline data of the two groups were compared ($P > 0.05$), indicating no statistically significant differences.

Table 1 Comparative analysis of laboratory parameters (mean ± SD) for the two groups

Groups	hs-CRP (mg/L)		WBC (× 10^9/L)		LDH (U/L)	
	Before 1 day	After 1 week	Before 1 day	After 1 week	Before 1 day	After 1 week
Observation (n = 51)	24.22 ± 1.12	4.70 ± 0.22[a]	12.01 ± 0.25	5.42 ± 0.20[a]	191.10 ± 20.18	133.84 ± 13.36[a]
Control (n = 51)	24.35 ± 1.22	5.39 ± 0.31[a]	11.89 ± 0.36	7.23 ± 0.18[a]	191.86 ± 20.20	160.86 ± 14.41[a]
t	0.561	12.963	1.955	48.039	0.190	9.820
P value	0.576	< 0.001	0.053	< 0.001	0.850	< 0.001

[a]P < 0.05, comparisons within the same group before and after treatment.
hs-CRP: High-sensitivity C-reactive protein; WBC: White blood cell; LDH: Lactate dehydrogenase.

Table 2 Comparison of wound granulation scoring between the two groups, *n* (%)

Groups	1 point	2 points	3 points	4 points
Observation (n = 51)	1 (1.96)	6 (11.76)	28 (54.90)	16 (31.37)
Control (n = 51)	5 (9.80)	12 (23.53)	23 (45.10)	11 (21.57)
Z	1.977			
P value	0.048[a]			

[a]P < 0.05, comparisons within the same group before and after treatment.

Table 3 Comparison of psychological health levels between the groups (mean ± SD, score)

Groups	Optimism		Hope		Self-efficacy		Psychological resilience	
	Before	After	Before	After	Before	After	Before	After
Observation (n = 51)	25.24 ± 3.66	35.35 ± 2.61[a]	25.19 ± 3.75	36.46 ± 2.69[a]	33.71 ± 2.51	40.29 ± 3.51[a]	32.30 ± 3.61	40.26 ± 2.66[a]
Control (n = 51)	25.31 ± 3.72	31.84 ± 2.50[a]	25.25 ± 3.72	32.87 ± 2.65[a]	33.39 ± 2.81	37.82 ± 3.57[a]	32.35 ± 3.59	35.80 ± 2.61[a]
t	0.096	6.936	0.081	6.790	0.607	3.523	0.070	8.547
P value	0.924	< 0.001	0.936	< 0.001	0.546	0.001	0.944	< 0.001

[a]P < 0.05, comparisons within the same group before and after treatment.

RESULTS

Laboratory indicators

A comparison of laboratory indicators between the two groups 1 day before treatment showed no significant difference (P > 0.05). However, 1 week after treatment, both groups exhibited significant changes in laboratory indicators compared to baseline, with notable differences (P < 0.05). Furthermore, the laboratory indicators of the observation group were significantly different from those of the control group (P < 0.05) (Table 1).

Wound granulation scoring

Following treatment with SFBT therapy combined with VSD, the granulation scoring of the wounds in the observation group was significantly higher compared to the control group (P < 0.05) (Table 2).

Psychological health status

Before treatment, the two groups had no significant difference in psychological health status (P > 0.05). However, after treatment, both groups showed a significant improvement in psychological health status compared to baseline (P < 0.05), with the observation group demonstrating a statistically significant difference compared to the control group (P < 0.05) (Table 3).

DISCUSSION

It is well-documented in the literature that in the medical field, physical recovery often comes with psychological challenges, especially for patients with wounds[11,12]. Pain, changes in appearance, social phobia, and self-identity issues can lead to a range of psychological issues, such as anxiety, depression, and post-traumatic stress disorder, affecting mental health. Their path to recovery is not limited to the physiological level but is also a profound experience of psychological reconstruction and social readjustment.

Traditional concepts suggest that wounds should be exposed to the air to promote healing. In contrast, modern medical research indicates that a moist environment is more conducive to wound healing. In clinical practice, the growth and coverage of granulation tissue over the wound indicate good repair. Moreover, LDH is an essential indicator of granulation growth's oxygen environment, while hs-CRP and WBC reflect the body's degree of infection and trauma. This study shows that one week after treatment, the tissue oxygen partial pressure, LDH, hs-CRP, and WBC in the observation group were all lower than those in the control group, and the wound granulation score was higher, with a significant difference between the two groups ($P < 0.05$). VSD is an effective method for treating wounds. Whether it is significant soft tissue defects, open fractures, burns, or other difficult-to-heal wounds, VSD can achieve significant therapeutic effects. It mainly uses controllable negative pressure to make the wound tissue fluid flow to the drainage tube, quickly discharge exudate, make the drainage area "zero accumulation", ensure blood supply to the wound, accelerate local blood circulation, stimulate tissue regeneration and granulation tissue growth, and speed up the wound healing rate. Simultaneously, it avoids the drawbacks of traditional wound treatment methods that require frequent dressing changes. Thus, it significantly reduces the number of dressing changes. Hence, it converts open wounds into closed wounds. Subsequently, this prevents external bacterial infections and makes patients more comfortable during treatment[13,14]. Therefore, focusing on the psychological problems of wound patients and applying SFBT therapy can further improve the mental health level of patients. SFBT therapy is a goal-oriented, short-term psychological treatment that emphasizes starting from a positive and proactive perspective. It focuses on the possibility of problem-solving rather than the problem itself. Consequently, it taps into the patient's resources and abilities and promotes individual self-growth and change[15]. During the implementation of SFBT therapy in this study, medical staff focused on cooperative communication with patients, thus promoting a trust-based cooperative relationship between the two parties to explore and solve problems jointly. Simultaneously, they guided patients to focus on their own resources and strengths. They emphasized the role of emotions in problem-solving and made them understand the harm of negative emotions to wound treatment. Further, they jointly formulated feasible solutions and encouraged them to practice and apply them. This helped patients learn effective emotional regulation skills. Thus, they improved patients' emotional management ability, better controlling negative emotions, reducing mental and psychological burden and pain, regaining confidence, and improving self-mental health. The limitation of this study is the data presented in this article. In the future, it would be best to include a more diverse patient population to examine the effectiveness across different sexes, ages, and backgrounds.

CONCLUSION

The combined application of SFBT and VSD treatment can accelerate the wound healing speed of patients undergoing wound treatment. It can also promote granulation growth and improve mental health, which is worth applying clinically.

FOOTNOTES

Author contributions: Shi WJ designed the study; Shi WJ and Zhou J analyzed the data; Shi WJ, Zhou J, Xu QL, Jiang Y, and Dai Q were involved in the data and writing of this article. All authors have read and approved the final manuscript.

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