

Understanding psychological wellbeing in the context of delayed wound healing: a scoping review

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ABSTRACT

Background Patients with delayed wound healing (DWH) experience psychological challenges that can hinder recovery, creating a detrimental cycle. The complex and multifaceted nature of psychological wellbeing, coupled with the heterogeneity of measurement tools used in chronic wound research, highlights the necessity for a more comprehensive understanding of the psychological facets of DWH.

Aim This scoping review aimed to synthesise evidence on psychological wellbeing components and their influencing factors in adults with DWH.

Methods Databases (Scopus, MEDLINE, CINAHL, EMBASE, ProQuest Global, PsycINFO) were searched for studies on adults (18+) with wounds persisting ≥ 4 weeks. Exclusions included pediatric, burn, malignant, and amputation-related wounds. Data extraction followed a dual-reviewer process, with synthesis guided by Ryff's psychological wellbeing framework.

Results Of 47 included studies, most were from Asia (31.9%); none were from Africa. Quantitative designs dominated (89.4%), with no psychological interventions identified. Fourteen instruments assessed wellbeing, primarily measuring quality of life ($n=43$), depression ($n=14$), and anxiety ($n=12$). Autonomy was frequently impacted by pain and mobility, while self-acceptance and personal growth were rarely examined.

Conclusions Standardised tools are needed to assess psychological wellbeing in DWH. Future research should prioritise underrepresented dimensions (such as personal growth, purpose) to inform targeted interventions.

Implications for clinical practice: Clinicians should manage wound symptoms and adopt holistic assessments that include psychological wellbeing domains, beyond quality of life, such as self-acceptance and personal growth, to improve patient-centered care and healing outcomes. Early screening for depression and anxiety, alongside tailored support, may help break the cycle of psychological distress and delayed healing.

Keywords models, psychological, psychological well-being, quality of life, symptom burden, wounds, chronic, wounds, delayed healing

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KEY MESSAGES

- This paper highlights the significant impact of psychological wellbeing on delayed wound healing, emphasising the need for a more structured approach to assess its role in patient outcomes.
- The goal of this paper is to explore the psychological dimensions of delayed wound healing, identify gaps in current research using Ryff's model as theoretical framework to improve understanding and guide future studies.
- Current research often overlooks key aspects of psychological wellbeing (such as self-acceptance and purpose) in wound care, emphasising the need for comprehensive, large-scale studies to better understand these factors and develop effective interventions.

2.5% of the U.S. population, and pose a significant health and economic burden, costing the U.S between \$28.1 to \$96.8 billion annually.^{1,2} In 2017/2018, the NHS managed 3.8 million patients with wounds, 30% of whom had non-healing wounds, occupying up to 40% of hospital beds.^{3,4} The management of chronic wounds costs the UK's NHS £5.6 billion annually, accounting for a significant portion of the total £8.3 billion spent on wound care.⁴ Common wound types like pressure ulcers, diabetic foot ulcers, arterial foot ulcers and venous ulcers^{5,6} are often defined as chronic, if these wounds fail to heal in 12 weeks.⁷⁻¹⁰ However, the term "hard-to-heal wound" proposes an earlier timeframe of four weeks to consider delayed wound healing (DWH) with the aim of improving outcomes.⁶

Beyond physical factors, like demographics and comorbidities,^{4,6,11,12} psychological wellbeing increasingly appears central to wound healing.¹³⁻¹⁶ Pain, exudate and odour from wounds contribute to body image issues, sleep disruption, low mood, immobility, social isolation and lost income, exacerbating psychological distress.^{13,17-21} Emerging

INTRODUCTION

Background

Chronic wounds affect 2.21 per 1000 people globally and

evidence reveals a vicious cycle: poor psychological states like depression, anxiety and stress may delay healing, while DWH worsens mental health.^{18,22–25}

However, despite the growing burden of psychological wellbeing on DWH, research in this field is limited by inconsistent tools and lack of standardised assessments.^{26–28}

Objectives

This scoping review aimed to systematically map existing research on factors influencing psychological wellbeing in individuals with DWH. By exploring the components of psychological wellbeing assessed and the factors affecting these outcomes, this review will inform future research and guide the development of effective interventions.

Research questions

Two primary research questions guided this study:

- What components of psychological wellbeing have been evaluated in people with DWH, and how have these been measured?
- What internal and external factors protect or threaten the likelihood of poor psychological wellbeing in people experiencing DWH?

METHODS

Protocol and registration

This scoping review protocol was registered in the Open Science Framework (OSF) at <https://osf.io/mexds/> in adherence to JBI guidance to enhance transparency and reproducibility.²⁹ Reference: DOI: 10.17605/OSF.IO/MEXDS. This review was reported based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).³⁰

Eligibility criteria

This review included studies where individuals had an active wound lasting at least four weeks, from multiple wound aetiologies, and mentions aspects of psychological wellbeing.

Active wounds were exclusively included to prevent recall bias stemming from past experiences that are no longer ongoing³¹ and wounds of four week duration represents the lower cut-off for classifying delayed wound healing.³² Studies excluded paediatric populations due to psychological concepts being influenced by their carer's wellbeing³³ and unreliable measurement tools for this age group.³⁴ Some wound types, such as burns, fungating or malignant wounds and patients with amputated limbs were excluded due to either the focus palliative care has on psychological wellbeing³⁵ or the psychological impact of amputation overshadowing the psychological impact of wound care and wound healing.^{36,37}

This included studies from any empirical research, peer-reviewed articles and grey literature written in English only and published between 2015 and 2024. Commentaries, case reports, letters, opinions, feasibility or psychometric studies, were also excluded. A full list of excluded studies can be found in the supplementary materials.

Information sources

Searches spanned Scopus, MEDLINE, CINAHL, EMBASE, ProQuest Global and PsycINFO. Grey literature was sourced from ProQuest Dissertations and Theses to counter publication bias.³⁸ Citation searching was equally employed to identify relevant studies. The date of the last search was 23 August 2024.

Search strategy

Boolean operators, truncations and keywords were used to combine terms related to wound population (FACET 1) and psychological wellbeing concept (FACET 2) as shown in Table 1. The search was limited to titles, full-texts and studies reported in English language in the last 10 years (2015–2024). A full electronic database search from MEDLINE can be found in the supplementary materials.

Study selection

Studies were managed in COVIDENCE and duplicates were removed. A two-stage screening process (title/abstract, full-text) applied inclusion and exclusion criteria.

Table 1. Search strategy used for the literature review

Facet 1: Wound population		Facet 2: Psychological wellbeing concept
"Delayed wound healing"		"Psychological wellbeing"
"Delayed wound healing" OR "Chronic wound*" OR "Non-healing wound" OR "Hard to heal wounds" OR "Diabetic foot ulcer" OR "Arterial ulcer" OR "Pressure ulcer" OR "Leg ulcer" OR "Skin ulcer" OR "Venous ulcer"	AND	"Psychological wellbeing" OR "Mental health" OR "Psychological distress" OR "Quality of Life" OR "Mood disorder" Anxiety OR Depression OR "Body image" OR Frustration OR Anger OR "Social isolation" OR "Sleep dis*" OR "Autonomy" OR "Positive relation*" OR "Environmental mastery" OR "Personal growth" OR "Purpose in life" OR "Self-acceptance" OR "Self-esteem"

Data extraction and charting

One reviewer extracted data using the JBI-adapted form.³⁸ The selection was verified by a second reviewer. The agreed-upon data was then compiled into a final document.

Data items

Extracted data included author, year of publication, country, healthcare setting, methods (such as qualitative, randomised controlled trials), wound type/s, demographics, instruments used to capture psychological wellbeing, study limitations and psychological constructs. These psychological constructs, where charted, related to specific diagnoses (such as anxiety, depression, mood disorders), patient reported psychological outcomes (such as quality of life), and dimensions of psychological wellbeing based on Ryff's model.³⁹ Carol Ryff's model of psychological wellbeing, encompassing dimensions like autonomy, environmental mastery, personal growth, positive relations, purpose in life and self-acceptance, offers a valid framework to explore these dynamics³⁹ and formed the basis of the data synthesis. Full quotes from the articles addressing each of Ryff's psychological wellbeing dimensions can be found in supplementary materials.

Critical appraisal of individual sources of evidence

Scoping reviews aim to map existing literature, identify gaps and inform future research, and therefore, rigorous appraisal of study quality is unnecessary.²⁹ However, study limitations reported by authors were highlighted and discussed.

Synthesis of results

A deductive approach, grounded in Carol Ryff's psychological wellbeing framework was used.^{39,40} Ryff's model, was chosen because it's development was underpinned by the eudaimonic theory of psychological wellbeing which emphasises meaning and purpose,⁴⁰ compared to hedonic theory which focuses on immediate pleasure and satisfaction.⁴¹ Eudaimonic theory facilitates a thorough examination of long-term psychological resilience and coping strategies, shedding light on how individuals navigate challenges and find deeper purpose amid extended healing processes.³⁹ Contrarily, hedonic theory, fixating on short-term pleasures, might mislead researchers by overlooking the profound emotional complexities and transformative experiences that patients enduring delayed healing encounter. The deductive approach chosen could lead to bias as it limits flexibility in the analysis by oversimplifying complex phenomena, making it difficult to accommodate unexpected data, and increasing the risk of overlooking alternative explanations.⁴² Nonetheless, a deductive approach is recommended when a study does not aim to develop a theory or conceptual framework but uses an existing theory for content analysis.⁴² Due to the broad scope of psychological wellbeing, the deductive approach was chosen as it enables a focused exploration of existing concepts⁴³ on psychological wellbeing in patient with DWH.

FINDINGS

Selection of sources of evidence

In total, 497 studies were included (480 from the database search and 17 from citation searching). A total 47 studies were included, as shown in Figure 1. A total of 155 duplicates were removed, 136 articles removed for irrelevance, 12 full text articles were not accessible and 147 studies were removed as they did not meet the eligibility criteria.

Characteristics of sources of evidence

Studies spanned from 2016–2023, with most studies (n=10, 21.7%) from the year 2017 and fewest in 2019 and 2023 (each n=4, 8.7%). Most studies involved patients with mixed ulcer aetiologies (n=22, 46.8%), followed by venous ulcers only (n=16, 34%) and diabetic foot ulcers only (n=7, 14.9%). Most studies were conducted in Asia (n=15, 31.9%). The single most common country where studies originated was Brazil (n=11, 23.4%). There were no studies from the African continent. Most studies used quantitative methodologies (n=40, 89.4%), cross-sectional design especially. A total of 6113 patients were evaluated in the included studies. For studies reporting gender (n=43 studies, 6040 patients), males predominated (n=3175, 52.6%). The least number of patients included was 16 and the greatest number was 618. In 18 of the 45 studies (40%) using quantitative tools, the most common tool used was the Short Form Health Survey (SF-12 and SF-36).

Results of individual sources of evidence

The results from individual studies can be found in Table 2 while the psychological dimensions reported to be affected in each study has been captured in Table 3.

Critical appraisal of studies

Study limitations were not reported in nine studies. Most studies reported small sample sizes^{50,55,60,77,79} as a limitation as this reduced statistical power, risking underestimation of psychological impact. Convenience sampling and single centre designs^{45,56,70,71} limit representativeness, with exclusion of some people (such as non-English speakers⁴⁵) or homogenous groups (such as 95% white British⁴⁶) overlooking cultural influences on mental health. Cross-sectional designs^{51,55,64,90} preclude causality, critical for understanding dynamics of mental health and wound chronicity, while short follow-up periods⁵⁶ miss long-term psychological trends.

Non-specific tools (such as DLQI, EQ-5D)^{44,49,54,61} fail to capture wound-specific psychological burdens, with short recall periods causing an underestimation of cumulative distress.⁴⁴ Self-reporting biases, exacerbated by visual difficulties⁶⁸ or the presence of significant others,⁴⁶ distort wellbeing estimates. Missing data,^{48,62} uncontrolled confounders (such as comorbidities^{52,62}) and secondary analyses⁴⁸ further weakens validity. Contextual factors, like specialised versus non-specialised settings,^{81,91} exclusively urban settings, socioeconomic gaps,^{56,71} and systemic differences (such as Germany's low direct patient costs⁹¹), also introduce biases unaddressed in many studies.

Synthesis of results

The majority of the 45 empirical studies were conducted in hospital settings, with a minority in community settings and none reported in rural areas. Of the eight randomised controlled trials, all explored the potential of medical treatments in reducing pain or hastening healing. None evaluated a psychological intervention. Autonomy was the most reported dimension (n=32 studies) while personal growth and self-acceptance were the least captured dimensions (n=5 studies each). The proportion of psychological dimensions addressed in literature has been mapped in Figure 2.

This review analysed the literature to understand the wound's impact on individuals' autonomy, environmental mastery, personal growth, purpose in life, self-acceptance and positive relations with others.

Table 2. Summary of individual sources of evidence

Authors, year	Cunha et al, 2017⁴⁴	Woo et al, 2017⁴⁵	McCaughan et al, 2018⁴⁶
Country	Portugal	Canada	UK
Healthcare settings in which wound care is offered	Not precise	All patients received home-based wound care delivered by community nurses in an urban setting	Data collected from acute and community nursing services in two locations (urban settings); both community and hospital setting
Methods	Mixed methods/cross-sectional design	Qualitative study	Qualitative study
Wound types	<ul style="list-style-type: none"> • Venous 50.6% • Mixed arterial and venous 19.8% • Arterial 14.8% • Lymphoedema-related 7.4% • Vasculopathic ulcers 3.7% • Other causes 3.7% 	<ul style="list-style-type: none"> • Non-specified leg ulcers 56.25% • Diabetic foot ulcers 31.25% • Pressure ulcers 6.25% • Other wound type 6.25% 	Surgical wounds
Number of patients	81	16	20
Sociodemographic description	<ul style="list-style-type: none"> • 46 females/35 males • Median age 76 years • Mean duration of wound 24 months 	<ul style="list-style-type: none"> • 6 females/10 males • Mean age 65.7 years • Duration of wound not precise 	<ul style="list-style-type: none"> • 11 females/9 males; • Median age 53 years; • Mean wound duration 10.95 months
Instruments used to capture aspects of psychological wellbeing	Dermatology Life Quality questionnaire	Not applicable	Not applicable
Study limitations reported by the authors	DLQI was self-administered and had missing info maybe from lack of understanding. DLQI is not specific for chronic leg ulcers and may underestimate QoL as it only evaluates impact in the previous week	Small sample size and aetiologies. Use of convenience sampling; non-English-speaking Canadians were excluded; no member checking	Significant others (patients' partners, family members and friends) were present when patients were interviewed; only one of the 20 study participants was of non-white British in origin (5%)
Authors, year	Salomé et al, 2016⁴⁷	De Fatima Rodrigues et al, 2016⁴⁸	Hopman et al, 2016⁴⁹
Country	Brazil	Brazil	Canada
Healthcare settings in which wound care is offered	Hospital and urban setting; outpatient wound care clinics	Basic health units in two cities; hospital and urban settings	community nurse teams; community setting, rural/urban setting details not precise
Methods	Cross-sectional study	Cross-sectional study	Prospective Cohort study
Wound types	Venous ulcers	<ul style="list-style-type: none"> • Venous ulcers 45%, • Mixed 21.5% • Diabetic ulcers 16.5%, • Arterial ulcers 10%, • Pressure ulcers 7%, 	Venous or mixed-venous (percentages not reported)
Number of patients	59	200	519

Table 2. Summary of individual sources of evidence (continued)

Sociodemographic description	<ul style="list-style-type: none"> • 38 females/21 males • Mean age 64/34 • Mean duration of ulcer 5.40 years 	<ul style="list-style-type: none"> • 124 females/76 males • Mean age 52.8 years • Mean duration of ulcer 30.1 months 	<ul style="list-style-type: none"> • 290 females/229 males • Mean age 67.5 years • Mean duration of ulcer 2.75 months
Instruments used to capture aspects of psychological wellbeing	Body Investment Scale (BIS); Rosenberg Self-Esteem Scale/Universidade Federal de Sao Paulo-Escola Paulista de Medicina (RSE/ UNIFESP-PPM)	Ferrans and Power QoL Index–Wound Version	EuroQoL-5 Dimensions, Short Form Health Survey (12-Item)
Study limitations reported by the authors	Not addressed	Lack of additional tests to help the wound etiology diagnosis; use of secondary data	Assessment of HRQoL was a secondary objective in the original studies; SF-12 is not a condition-specific instrument; inclusion limited to cognitively intact and community dwelling
Authors, year	Miertova et al, 2016⁵⁰	Sehlo et al, 2016⁵¹	Walburn et al, 2017⁵²
Country	Slovakia	Saudi Arabia	UK
Healthcare settings in which wound care is offered	Specialized outpatients' clinics- University hospital, Martin: Hospital and urban setting in Turiec region	Outpatient diabetic foot clinic at King Abdulaziz University hospital in Jeddah, Saudi Arabia (Hospital and urban setting)	Recruitment from primary care clinics. Healthcare settings rural/urban or community wound care services not precise
Methods	Cross-sectional study	Cross-sectional study	Prospective longitudinal study
Wound types	Venous leg ulcers	Diabetic foot ulcers	Venous leg ulcers
Number of patients	61	80	63
Sociodemographic description	<ul style="list-style-type: none"> • 35 females/26 males • Mean age 68.6 years • Mean duration of wound was 6.34 years 	<ul style="list-style-type: none"> • 25 females/55 males • Mean age 56.55 years; • Mean duration of ulcer 3.09 months 	<ul style="list-style-type: none"> • 38 females/25 males • Mean age 68.1 years • Mean duration of ulcer 18 weeks
Instruments used to capture aspects of psychological wellbeing	Freiburg Life Quality Assessment-wound module	Center for Epidemiologic Studies Depression Scale, Illness Invalidation Inventory, Short Form Health Survey (36-Item)	Hospital Anxiety and Depression Scale; Short Form Health Survey (12-Item); Adherence to Treatment questionnaire; Diabetes Self-Care Activities Measure and a Health Behaviour Scale; Illness perception questionnaire; Perceived Stress Scale.
Study limitations reported by the authors	Small sample size	Causal inferences cannot be made because of the cross-sectional design; there is a bi-directional relationship between depression and illness invalidation as negative perceptions are common in depressive disorders; lack of control group of diabetic patients without foot ulcers	Possible measurement errors as the study captured the complex healing process as surface area only; control for potential confounding variables (such as medication, weight, and venous pathology) was not done

Table 2. Summary of individual sources of evidence (continued)

Authors, year	Deufert & Graml, 2017 ⁵³	Meaume et al, 2017 ⁵⁴	Tavares et al, 2017 ⁵⁵
Country	Austria	France	Brazil
Healthcare settings in which wound care is offered	Patients received wound care at home, specialist or ambulatory wound clinics; rural/urban setting not precise	45 specialised centres; rural or urban setting not precise	Wound Repair Outpatient Clinic from the Regional Polyclinic in the state of Rio de Janeiro; hospital and urban setting
Methods	Cross-sectional study	Randomised controlled trial	Cross-sectional study
Wound types	<ul style="list-style-type: none"> • Venous ulcers 50.8% • Arterial ulcers 10.2% • Mixed venous/arterial ulcer s10.2% • Diabetic foot ulcers 16.9% • Pressure ulcers 10.2% • Not stated 1.7% 	Venous or mixed leg ulcers (percentages not reported)	<ul style="list-style-type: none"> • Venous ulcers 76% • Arterial ulcers 2% • Diabetic ulcers 18% • Mixed ulcers 2% • Venous and diabetic ulcers 2%
Number of patients	59	187	50
Sociodemographic description	<ul style="list-style-type: none"> • 26 females/33 males • Mean age 69.55 years • Mean duration of wounds 21.66 months 	<ul style="list-style-type: none"> • 122 females/65 males • Mean age TLC-NOSF 72.6 years • Mean age TLC 74.4 years. • Inclusion duration 6–36 months. 	<ul style="list-style-type: none"> • 23 females/27 males • Mean age not reported; 60% (60–69 years) • Mean duration 5.5 years.
Instruments used to capture aspects of psychological wellbeing	Wound-QoL (Questionnaire on quality of life with chronic wounds)	EuroQoL-5 Dimensions EQ-5D)	Short Form Health Survey (36-Item)
Study limitations reported by the authors	A possible selection bias as a volunteer sample is not representative in comparison to the general population; the sex ratio, the distribution of wound diagnoses as well as the low case number could have led to distortion	EQ-5D used is non-specific to wounds	The small sample size limits generalization and the cross-sectional design hinders the establishment of relationships among cause, exposure and outcome
NOSF=nano-oligosaccharide factor; TLC: lipidocolloid matrix.			
Authors, year	Li et al, 2017 ⁵⁶	Mohd Yazid et al, 2017 ⁵⁷	Cwajda-Bialasik et al, 2017 ⁵⁸
Country	Canada	Malaysia	Poland
Healthcare settings in which wound care is offered	Single hospital centre; details about rural/urban setting not precise	Recruitment in tertiary hospital; details about rural/urban setting not precise	Outpatient Clinic in the Department and Clinic of General Surgery in Bydgoszcz; hospital and urban setting
Methods	Randomised controlled trial	Randomised controlled trial	Cross-sectional study
Wound types	Diabetic foot ulcers	Diabetic foot ulcers	<ul style="list-style-type: none"> • Venous ulcers (VU) 33.9% • Arterial ulcers (AU) 32.9% • Mixed ulcers (MU) 33.2%
Number of patients	103	60	298

Table 2. Summary of individual sources of evidence (continued)

Sociodemographic description	<ul style="list-style-type: none"> • 34 females/69 males • Mean age HBOT* 61 years • Mean age Placebo control group 62 years • Mean duration HBOT 7.8 months • Mean duration Placebo control group 11.2 months. 	<ul style="list-style-type: none"> • 29 females/31 males • Mean age HBOT 54.23 years • Mean age control 58.7 years • Mean duration 5.2 months 	<ul style="list-style-type: none"> • 172 females/126 males • Mean age VU 66.2 years • Mean age AU 65.7 years • Mean age MU 67.8 • Mean duration VU 36 months • Mean duration AU 18 months • Mean duration MU 36 months
Instruments used to capture aspects of psychological wellbeing	EuroQoL-5 Dimensions (EQ-5D)	Short Form Health Survey (36-Item)	Skindex-29; Acceptance of Illness Scale; Beliefs about Pain Control Questionnaire; Coping Strategy Questionnaire
Study limitations reported by the authors	Data of the single-center trial may limit the generalisability; maximum follow-up in this study was 12 weeks; efficacy beyond that is unsure; HRQoL was not the primary study outcome in the RCT; no data on socioeconomic status	Sample size for the study was small; limitation to control each single dressing to be used in both HBOT and control groups.	Lack of repeated evaluation of the QoL, acceptance of illness and the pain defining parameters which should be made after the congeneric therapy implementation and the education of diseased patients
*HBOT=Hyperbaric oxygen therapy.			
Authors, year	Purcell et al, 2017⁵⁹	Connor et al, 2018⁶⁰	Almeida et al, 2018⁶¹
Country	Australia	USA	Brazil
Healthcare settings in which wound care is offered	Patients from six community nursing clinics; details about rural/urban setting not precise	Not precise	Primary health care units, surgery/diagnostic clinics/home care visits in Mato Grosso do Sul-Hospital and urban setting
Methods	Randomised controlled trial	Randomised controlled trial	Cross-sectional study
Wound types	<ul style="list-style-type: none"> • Venous ulcers 66.7% • Arterial ulcers 13.3% • Mixed ulcers 13.3% • Incompressible ulcers 5% • Diabetic foot ulcers 1.66% 	Sickle cell ulcers	<ul style="list-style-type: none"> • Venous ulcers 54.7% • Pressure ulcers 15.1% • Diabetic foot ulcers 16.98% • Other types 13.2%
Number of patients	60	32	53
Sociodemographic description	<ul style="list-style-type: none"> • 35 females/25 males • Mean age Intervention Group 73.4 years • Mean age Control Group 73.8 years • Mean duration Intervention 26.4 weeks • Mean duration Control 20.5 weeks 	<ul style="list-style-type: none"> • 18 females/14 males • Mean age of 35.9 years • Duration >12 months (41%) 	<ul style="list-style-type: none"> • 28 females/25 males • Mean age 62.17 years • Mean duration of ulcer not reported but inclusion >3 months

Table 2. Summary of individual sources of evidence (continued)

Instruments used to capture aspects of psychological wellbeing	Cardiff Wound Impact Schedule	Short Form Health Survey (36-Item)	World Health Organization Quality of Life (WHOQoL-100)
Study limitations reported by the authors	Participants or the community nurses providing the treatment and collecting outcome data were not blinded; inconsistent use of the triglyceride mesh within both groups may have introduced a confounding factor; data collection across multiple time points, associated with missing data; multiple ulcer type could have contributed to confounding	Small sample size limits generalisability; longer than four weeks of treatment may be needed to confirm or observe greater improvement in QoL measurements; considering the recalcitrant nature of sickle leg ulcers	Participants were recruited from primary health care units, by spontaneous demand, and visits to patients' homes, potential poor coverage; instrument used is not specific to patients with chronic wounds
Authors, year	Jull et al, 2018⁶²	Costa de Oliveira et al, 2019⁶³	Fino et al, 2019¹⁴
Country	New Zealand	Brazil	Italy
Healthcare settings in which study was conducted	Five hospital centres; details about rural/urban setting not precise	Outpatient specialised centres and households followed by primary health care in the city of Teresina-Urban setting.	Complex wound care unit; details about rural/urban setting not precise
Methods	Randomised controlled trial	Cross-sectional study	Case-control
Wound types	Venous ulcers	<ul style="list-style-type: none"> • Non-specified lower limb ulcers 32.95% • Diabetic ulcers 23.3% • Traumatic wounds 17.6% • Pressure ulcers 14.2% • Leprosy ulcers 5.7% • Erysipelas 6.25% 	<ul style="list-style-type: none"> • Venous ulcers 48.5% • Ischaemic ulcers 12% • Venous and Ischaemic ulcers 8.1% • Diabetic and vascular ulcers 15% • Pressure ulcers 6.1% • Other 9.1%
Number of patients	618	176	33
Sociodemographic description	<ul style="list-style-type: none"> • 305 females/313 males • Mean age 63.7 years • Mean ulcer duration 39 weeks 	<ul style="list-style-type: none"> • 86 females/90 males • Aged 41–59 years • Mean duration of ulcer not reported 	<ul style="list-style-type: none"> • Female/male ratio not provided • Mean age 71 years cases • Mean age 73 years controls • Inclusion criteria >6 weeks duration
Instruments used to capture psychological wellbeing	Short Form Health Survey (36-Item)	Cardiff Wound Impact Schedule	Becks Depression Inventory

Table 2. Summary of individual sources of evidence (continued)

Study limitations reported by the authors	Used 15-year-old survey as comparison data; only collected ulcer-related medical history and were unable to adjust for comorbidities, such as diabetes, arthritis and respiratory diseases	Lack of an updated database of patients with wounds followed up in basic health care, as well as the lack of knowledge about the cases of people with wounds, may have influenced the number of study participants	Not addressed
Authors	Handayani & Widiyanto, 2019⁶⁴	Jockenhöfer et al, 2020⁶⁵	Kumar et al, 2020⁶⁶
Country	Indonesia	Germany	India
Healthcare settings in which study was conducted	Public health and wound clinic; Magelang Hospital and urban setting.	Certified wound care clinic at the University Medical Center in Essen; hospital and urban setting.	All India Institute of Medical Sciences Rishikesh; details about rural/urban setting not precise
Methods	Cross-sectional study	Randomised controlled trial	Prospective cohort study
Wound types	Diabetic foot ulcers	Venous ulcers	Venous ulcers 39.2% Diabetic ulcer 530.4% Ischaemic ulcers 30.4%
Number of patients	35	20	125
Sociodemographic description	<ul style="list-style-type: none"> • 18 females/17 males • 65.7% 60 years and less • Minimum duration of healing one month 	<ul style="list-style-type: none"> • 10 females/10 males • Median age 61.5 years • Inclusion criteria >8 weeks 	<ul style="list-style-type: none"> • 26 females/99 males • Mean age not reported but only adult patients included • Mean duration not reported but inclusion criteria duration >3 months
Instruments used to capture psychological wellbeing	World Health Organization Quality of Life	World Health Organization Quality of Life; Hospital Anxiety and Depression Scale	Hospital Anxiety and Depression Scale
Study limitations reported by the authors	The small sample size, as well as the inclusion of only two hospitals, limit generalisation; wound evolution and its impact on QoL over time not studied because of the cross-sectional design; exclusive use of self-reported instruments was a limitation	Not addressed	Not addressed
Authors, year	Zou et al, 2020⁶⁷	Vogt et al, 2020⁶⁸	Ren et al, 2020⁶⁹
Country	China	Brazil	China
Healthcare settings in which study was conducted	Not precise	Two specialised outpatient clinics, one of a large university hospital and another of a basic health unit; details about rural/urban setting not precise	Multi-centric study; details about health care setting, community clinics, rural/urban not precise
Methods	Pre-post study	Cross-sectional study	Cross-sectional study

Table 2. Summary of individual sources of evidence (continued)

Wound types	Venous ulcers	<ul style="list-style-type: none"> • Diabetic foot ulcers 41% • Venous ulcer 52.1% • Calluses/lesion leprosy 12% • Osteomyelitis 7% • Other wounds 19% 	<ul style="list-style-type: none"> • Diabetic foot ulcers 56.4% • Traumatic ulcers 16.3% • Venous ulcers 16% • Arterial ulcers 1.3%
Number of patients	90	100	300
Sociodemographic description	<ul style="list-style-type: none"> • 48 females/40 males • 68.89% of patients >60 years • Inclusion criteria >1 year with ulcer 	<ul style="list-style-type: none"> • 49 females/51 males • Mean age 60.98 years • 83% wound duration >24 months 	<ul style="list-style-type: none"> • 148 females/152 males • Mean age 53.76 years • Median duration of ulcer 4.7 months
Instruments used to capture psychological wellbeing	Short Form Health Survey (36-Item)	Wound-QoL (Questionnaire on quality of life with chronic wounds), Freiburg Life Quality Assessment-wound module	Short Form Health Survey (36-Item), Social Support Rating Scale, self-reported economic stress
Study limitations reported by the authors	Not addressed	Some patients in the sample had visual difficulties, with difficulty to read, perhaps due to low education and income; a professional was available to assist in the reading of the instruments	Economic stress measurement may be subject to potential self-reporting bias; causal relationship between these variables was only speculative because of the study design. Larger sample may be required for moderated mediation analysis.
Authors, year	Putri et al, 2021⁷⁰	Ozkan et al, 2021⁷¹	Yan Yu et al, 2021⁷²
Country	Indonesia	Turkey	China
Healthcare settings in which study was conducted	Two outpatient clinics in Bali; hospital and urban setting	Specialised wound care unit (Aydin Adnan Menderes University Research and Training Hospital Nazli-Selim Eren); details about rural/urban setting not precise	Wound center of a large hospital receiving patients from 22 different hospitals of northwest China, details about rural/urban setting not precise
Methods	Cross-sectional study	Cross-sectional study	Cross-sectional study
Wound types	Diabetic foot ulcers	<ul style="list-style-type: none"> • Diabetic foot ulcers 79.9% • Arterial ulcers 9.0% • Other ulcers 11.2% 	<ul style="list-style-type: none"> • Diabetic foot ulcers 47.2% • Venous ulcers 36.6% • Surgical wounds 12.96% • Pressure ulcers 3.2%
Number of patients	201	134	216

Table 2. Summary of individual sources of evidence (continued)

Sociodemographic description	<ul style="list-style-type: none"> • 103 females/98 males • Mean age 55.53 years • Mean duration of wounds 4.89 months 	<ul style="list-style-type: none"> • 33 females/101 males • Mean age 60.4 years • Mean wound duration was 9.4 months 	<ul style="list-style-type: none"> • 69 females/147 males • Mean age 62 years • Inclusion wounds > 3 months
Instruments used to capture psychological wellbeing	Diabetic Foot Ulcer Scale (Short Form); Body Investment Scale questionnaire	Barthel Index; Short Form Health Survey (12-Item)	Perceived Social Support Scale; Short Form Health Survey (36-Item); Self-Rating Anxiety Scale; Self-Rating Depression Scale; Medical Coping Modes Questionnaire
Study limitations reported by the authors	Cross-sectional study design; results cannot prove a causal relationship; convenience sampling may have resulted in selection bias; the study included participants who had no more than two ulcers, therefore the results may be underestimated	Single center limits generalisability; patients' QoL before and after treatment was not assessed and the lack of long-term monitoring; data's reliability is limited by patient self-reporting; the contribution of economic burden or socioeconomic status to QoL was not addressed	Not addressed
Authors, year	Yan, Strandlund et al, 2021⁷³	Ren et al, 2021⁷⁴	Reinboldt-Jockenhöfer et al, 2021⁷⁵
Country	China	China	Germany
Healthcare settings in which study was conducted	Wound center of a large hospital receiving patients from 22 different hospitals in northwest China; details about rural/urban setting not precise	Three wound clinics affiliated with three public hospitals in Beijing, China; details about rural/urban setting not precise	Four German centres: three at the Essen University Hospital and one in Dortmund; details about rural/urban setting not precise
Methods	Cross-sectional study	Cross-sectional study	Cross-sectional study
Wound types	<ul style="list-style-type: none"> • Diabetic foot ulcers 47.2% • Venous ulcers 36.6% • Surgical wounds 12.96% • Pressure ulcers 3.2% 	<ul style="list-style-type: none"> • Diabetic foot ulcers 41.4% • Traumatic ulcers 29.6% • Venous ulcers 15.4% • Arterial ulcers 13.6% 	<ul style="list-style-type: none"> • Diabetic foot ulcers 44.8% • Venous leg ulcers 33.9% • Arterial leg ulcers 13.6% • Mixed leg ulcers 7.6%
Number of patients	216	162	381
Sociodemographic description	<ul style="list-style-type: none"> • 69 females/147 males • Mean age 62 years • Inclusion wounds >3 months 	<ul style="list-style-type: none"> • 64 females/98 males • Mean age 55.05 years • Median duration 3 months 	<ul style="list-style-type: none"> • 152 females/229 males • Mean age 68.9 years • Included if no tendency to heal after 8 weeks
Instruments used to capture psychological wellbeing	Short Form Health Survey (36-Item); Perceived Social Support Scale; Self-Rating Anxiety Scale Self-Rating Depression Scale; Medical Coping Modes Questionnaire	Short Form Health Survey (36-Item); Social Support Rating Scale	Wound-QoL (Questionnaire on quality of life with chronic wounds)
Study limitations reported by the authors	The study did not conduct follow-up observations and did not serially measure healing, hospitalisation time, final cost, and other related data; the influence of culture on anxiety and depression was assessed solely by semi structured interview, not quantitative evaluation	The diversity of the wound types made the exploration of the impact of pain on the HRQoL lack homogeneity; Longitudinal design should be applied to better understand the correlations among these variables over time	The health care system in Germany ensures that the financial burden on patients is significantly lower than in many other countries; the choice of specialised centres where mostly refractory cases are treated can lead to bias; one time point data collection hindered analysis of dynamics; some predictors were not explored

Table 2. Summary of individual sources of evidence (continued)

Authors, year	Kaizer et al, 2021⁷⁶	Dias et al, 2022⁷⁷	Moscicka et al, 2022⁷⁸
Country	Brazil	Portugal	Poland
Healthcare settings in which study was conducted	Three specialized care units for people with injuries in Minas Gerais and São Paulo. More details about rural/urban setting not precise.	Participants were followed up at the Diabetic Foot Outpatient Clinic of two major, centrally located hospitals. Hospital and urban settings.	Patients recruited from highly specialised national centre for chronic wound healing. More details about rural/urban setting not precise.
Methods	Cross-sectional study	Cross-sectional study	RCT
Wound types	Venous ulcers	Diabetic foot ulcers	Venous ulcers
Number of patients	70	70	92
Sociodemographic description	<ul style="list-style-type: none"> • 29 females/41 males • Mean age 66.5 years • Mean wound duration 57.2 months 	<ul style="list-style-type: none"> • 16 females/54 males • Mean age 66.19 years • Mean wound duration 8.17 weeks 	<ul style="list-style-type: none"> • 47 females/45 males • Mean age Intervention Group 64.5 years • Mean age Control Group 63.6 years • Mean duration Intervention 72.5 months • Mean duration Control 40.8 months
Instruments used to capture psychological wellbeing	Freiburg Life Quality Assessment-wound module	Illness Perception Questionnaire-Brief; Hospital Anxiety and Depression Scale	Skindex-29; Chronic Venous Insufficiency Questionnaire
Study limitations reported by the authors	Data are secondary to primary research related to lifestyle in patients with VU. Collecting QoL through interviews rather than self-completion may make participants omit information because they feel embarrassed to answer questions.	The small sample size, as well as the inclusion of only two hospitals, limit generalizability. The cross-sectional design did not allow for studying the wound evolution and its impact on QoL over time. The exclusive use of self-reported instruments is also an important limitation	Not addressed
Authors and year	Shankar et al, 2022⁷⁹	Dantas et al, 2022⁸⁰	Zhu et al, 2022⁸¹
Country	India	Brazil	Singapore
Healthcare settings in which study was conducted	An outpatient clinic of the department of vascular surgery in a tertiary care teaching hospital in South India; details about rural/urban setting not precise	Patients recruited from a specialised skin care service at a university hospital in the state of Paraíba; details about rural/urban setting not precise	Patients were recruited from six general primary care clinics; details about rural/urban setting not precise
Methods	Cross-sectional study	Cross-sectional study	Cross-sectional study
Wound types	Venous ulcers	Venous ulcers 27.1% Other ulcers 72.9%	<ul style="list-style-type: none"> • Diabetic foot ulcers 33.5% • Venous ulcers 10.3% • Arterial ulcers 5.6% • Mixed ulcers 7.7% • Atypical hard to heal wounds 34.3% • Others 8.6%

Table 2. Summary of individual sources of evidence (continued)

Number of patients	40	85	233
Sociodemographic description	<ul style="list-style-type: none"> • 21 females/21 males • Mean age 55.45 years • Mean duration of ulcer 7.26 months 	<ul style="list-style-type: none"> • 45 females/40 males • 45.9% over 60 years of age • Only wounds >4 weeks included 	<ul style="list-style-type: none"> • 74 females/159 males • Mean age 61.2 years • 1–6 months 72.1%
Instruments used to capture psychological wellbeing	Short Form Health Survey (36-Item)	Short Form Health Survey (36-Item); Cardiff Wound Impact Schedule	EuroQoL-5 Dimensions (EQ-5D)
Study limitations reported by the authors	Study had a small sample size, used a cross-sectional study design and influence of patient-specific socio-demographic factors and other comorbidities on the HRQoL of the study subjects were not ruled out; recommended long-term follow-up study in larger population,	Single setting, so not possible to point out causal relationships due to the cross-sectional design	Patients were recruited from non-specialised wound clinics; a positively overrated HRQoL with more 'no problem' could be due to ceiling effects of the EQ-5D-5L instrument; a generic and wound-specific instrument could have been used for better sensitivity
Authors, year	Li et al, 2022 ⁸²	de Souza Bandeira et al, 2022 ⁸³	Chan et al, 2023 ⁸⁴
Country	China	Brazil	Singapore
Healthcare settings in which study was conducted	Chronic wound nursing clinic from outpatient health care facilities; details about rural/urban setting not precise	Outpatient clinic of the University Hospital In Joao Pessoa – Paraíba; details about rural/urban setting not precise	Patients recruited from three university affiliated tertiary hospitals; details about rural/urban setting not precise
Methods	Cross-sectional study.	Cross-sectional study	Prospective cohort study
Wound types	<ul style="list-style-type: none"> • Lower limb arterial/venous ulcers 11.6% • Diabetic foot ulcers 37.2% • Pressure ulcers 24.0% • Traumatic wounds 14.0% • Infectious wounds 13.2% 	<ul style="list-style-type: none"> • Arterial ulcers 2.5% • Venous ulcers 55.0% • Diabetic ulcers 10.0% • Traumatic ulcers 5.0% • Surgical wounds 10.0% • Pressure ulcers 2.5% • Other wounds 15.0% 	<ul style="list-style-type: none"> • Venous ulcers
Number of patients	129	40	255
Sociodemographic description	<ul style="list-style-type: none"> • 46 females/ 83 males • Mean age 59.85 years • Wound duration 1–6 months for 82.2% 	<ul style="list-style-type: none"> • Gender not reported • Wounds at least 4 weeks duration • Duration 1 year+ for n=21 (52.5%) 	<ul style="list-style-type: none"> • 108 females/147males • Mean age 65.2 years • Median duration of wound 1.27 years
Instruments used to capture psychological wellbeing	Cardiff Wound Impact Schedule; Hospital Anxiety and Depression Scale; Medical Coping Modes Questionnaire	Geriatric Depression Scale-15	EuroQoL-5 Dimensions (EQ-5D)

Table 2. Summary of individual sources of evidence (continued)

Study limitations reported by the authors	Self-reporting limited by participants' ability to self-reflect and their willingness to be open with their information; impacts of participants' religion and residence on their QoL was not considered; comparison of urban/rural residence were not done	Not addressed	Wound Area Reduction was not included in the analysis; data on all wound interventions received by patients prior and during the study was not collected; included multiple tertiary institutions where treatment protocols may vary; single-arm study with no comparator group
Authors, year	Goulart de Oliveira et al, 2023⁸⁵	Severino et al, 2023⁸⁶	Pasek et al, 2023⁸⁷
Country	Brazil	Brazil	Poland
Healthcare settings in which study was conducted	Patients recruited in a public health network in a municipality in the State of Mato Grosso do Sul; details about rural/urban setting not precise	PHC of the municipality of Parnanirim, State of Rio Grande do Norte; details about rural/urban setting not precise	Patients hospitalised at the Department of Internal Diseases, Angiology, and Physical Medicine in Bytom; details about rural/urban setting not precise
Methods	Cross-sectional study	Cross-sectional study.	Prospective cohort study
Wound types	Venous ulcers	Venous ulcers	Venous ulcers
Number of patients	57	103	129
Sociodemographic description	<ul style="list-style-type: none"> • 30 females/27 males • Mean age 63.1 years • 49.1% had the lesion one month and one year 	<ul style="list-style-type: none"> • 75 females/28 males • Mean age not reported • Inclusion criteria at least three months. 	<ul style="list-style-type: none"> • 57 females/72 males • Mean age 67 years • Mean ulcer duration HBOT 3.36 years • Mean ulcer duration in control 3.37 years
Instruments used to capture psychological wellbeing	Freiburg Life Quality Assessment-wound module	Short Form Health Survey (36-Item)	EuroQoL-5 Dimensions (EQ-5D); Short Form Health Survey (36-Item)

Table 2. Summary of individual sources of evidence (continued)

Study limitations reported by the authors	Limited sample size, and only one location, limits the generalisability; non-specific scale for venous ulcers was used, this may impact accuracy; lack of qualified care prevents use of evidence-based treatment	Sample size not attained; use of psychoactive medications was not assessed; interviews after wound exposure in consultation may have caused discomfort and triggered memories and feelings and, consequently, an overestimation in the answers provided	Non-representative and relatively small sample size, and the recruitment of participants only from one health center; the study also did not include the analysis of previous standards of care
Authors, year	Newbern, 2018⁸⁸	Stechmiller et al, 2019⁸⁹	
Country	USA	USA	
Healthcare settings in which study was conducted	Not applicable as multiple studies included	Not applicable as multiple studies included	
Methods	Integrative review	Literature review	
Wound types	Vascular ulcers	Venous ulcers	
Number of studies	36 studies	Not reported	
Sociodemographic description	At least one month wound duration	A chronic venous leg ulcer is defined as an open lesion between the knee and the ankle joint that remains unhealed for at least 30 days	
Instruments used to capture psychological wellbeing	EuroQoL-5 Dimensions; Short Form Health Survey (36-Item), Hospital Anxiety and Depression Scale	Not reported	
Study limitations reported by the authors	Lack of data reported regarding pain assessment and in terms of cultural, racial, and ethnic diversity of patients with chronic wounds secondary to lower-extremity vascular disease (LEVD); assessment of the instruments included in the review was limited by search criteria and published literature and lack of common comparators or a validated tool specific for assessing pain associated with chronic wounds related to LEVD; pain is often multifaceted and not easily classified as chronic or acute; analysis of the literature was limited by the evidence and the classifications of pain in the current literature	Not addressed	
EuroQoL-5 Dimensions; Hospital Anxiety and Depression Scale			

Table 3. Psychological outcomes measured, and Ryff's psychological dimensions affected (continued)

		✓	Addressed
		X	Not addressed
Depression addressed	2020	✓	Kumar et al, 2020 ⁶⁶
		X	Ren et al, 2020 ⁶⁹
Anxiety addressed	2020	✓	Vogt et al, 2020 ⁶⁸
		X	Zou et al, 2020 ⁶⁷
HRQOL addressed	2020	✓	Jockenhöfer et al, 2020 ⁶⁵
		X	Kaizer et al, 2021 ⁷⁶
Autonomy	2021	✓	Ozkan et al, 2021 ⁷¹
		X	Putri et al, 2021 ⁷⁰
Environmental mastery	2021	✓	Reinboldt-Jockenhöfer et al, 2021 ⁷⁵
		X	Ren et al, 2021 ⁷⁴
Personal growth	2021	✓	Yan, Yu, et al, 2021 ⁷²
		X	Yan, Strandlund, et al, 2021 ⁷³
Positive relations with others	2022	✓	Dantas et al, 2022 ⁸⁰
		X	Dias et al, 2022 ⁷⁷
Purpose in life	2022	✓	Mościcka et al, 2022 ⁷⁸
		X	Shankar et al, 2022 ⁷⁹
Self-acceptance	2022	✓	Zhu et al, 2022 ⁸¹
		X	Li et al, 2022 ⁸²
Psychological wellbeing aspects affected	2023	✓	de Souza Bandeira Correia et al, 2022 ⁸³
		X	Chan et al, 2023 ⁸⁴
Autonomy	2023	✓	Goulart De Oliveira et al, 2023 ⁸⁵
		X	Severino et al, 2023 ⁸⁶
Environmental mastery	2023	✓	Pasek et al, 2023 ⁸⁷
		X	
Personal growth	2023	✓	
		X	
Positive relations with others	2023	✓	
		X	
Purpose in life	2023	✓	
		X	
Self-acceptance	2023	✓	
		X	

AUTONOMY

Autonomy, defined as an individual's sense of independence, self-determination and freedom of choice,³⁹ was the most addressed dimension (n=32/47, 68.7%) in the studies reviewed. Patients' autonomy was significantly impacted by pain, mobility limitations, daily activity restrictions, fatigue and sleep disturbances.

Pain, itching and wound-related physical symptoms

Lowest scores in quality of life have been reported in patients with wound-related physical symptoms.^{56,68} Pain, a pervasive symptom in delayed wound healing, was described as a constant, overwhelming, and worsened by procedures, like dressing changes and debridement.⁸⁸ It is a widely reported issue^{46,50,90} with up to 34.6% of patients experiencing severe pain.⁶⁹ Pain notably disrupts quality of life (QoL),⁷⁸ with older patients with venous ulcers reporting higher pain levels than younger patients with other wound types.⁷³ Pain correlates with lower QoL scores⁹² and affects physical functioning,^{64,76} explaining 12.5% of physiological QoL variance.⁷² Treatments like hyperbaric oxygen therapy⁸⁷ and nano-oligosaccharide factor⁵⁴ have shown success in pain reduction. Younger

patients and those with wounds of venous origin report more pronounced physical symptoms.^{58,85} Oedema (48%) and itching (20%) are also common complaints, with oedema linked to increased pain.^{45,55}

Mobility and activities of daily living

While some studies suggest physical symptoms and daily living are less impacted than other domains,^{56,63} others identify them as the most affected QoL aspects.^{50,79} Leisure activity limitations were reported by 45.7% of patients due to wounds.⁵³ Cunha et al⁴⁴ found 73.4% experienced autonomy and daily activity limitations, with nearly 50% dependent in at least one activity. Increased dependency on others rises with disability,^{45,46} though independent mobility improves physical QoL scores.⁴⁹ Wound relapse and durations exceeding six months worsen daily life evaluations and health-related QoL (HRQoL) related to mobility.^{81,85} Younger patients and those with venous leg ulcers face greater physical functioning impacts,^{62,81} while diabetic foot ulcers show the most severe mobility impairments.⁹¹ Depression, coping style and education level explain 51.7% of daily living variance,⁸² with depressed patients showing poorer physical functioning.⁵¹ Pain-induced stress further disrupts daily activities.⁶⁹

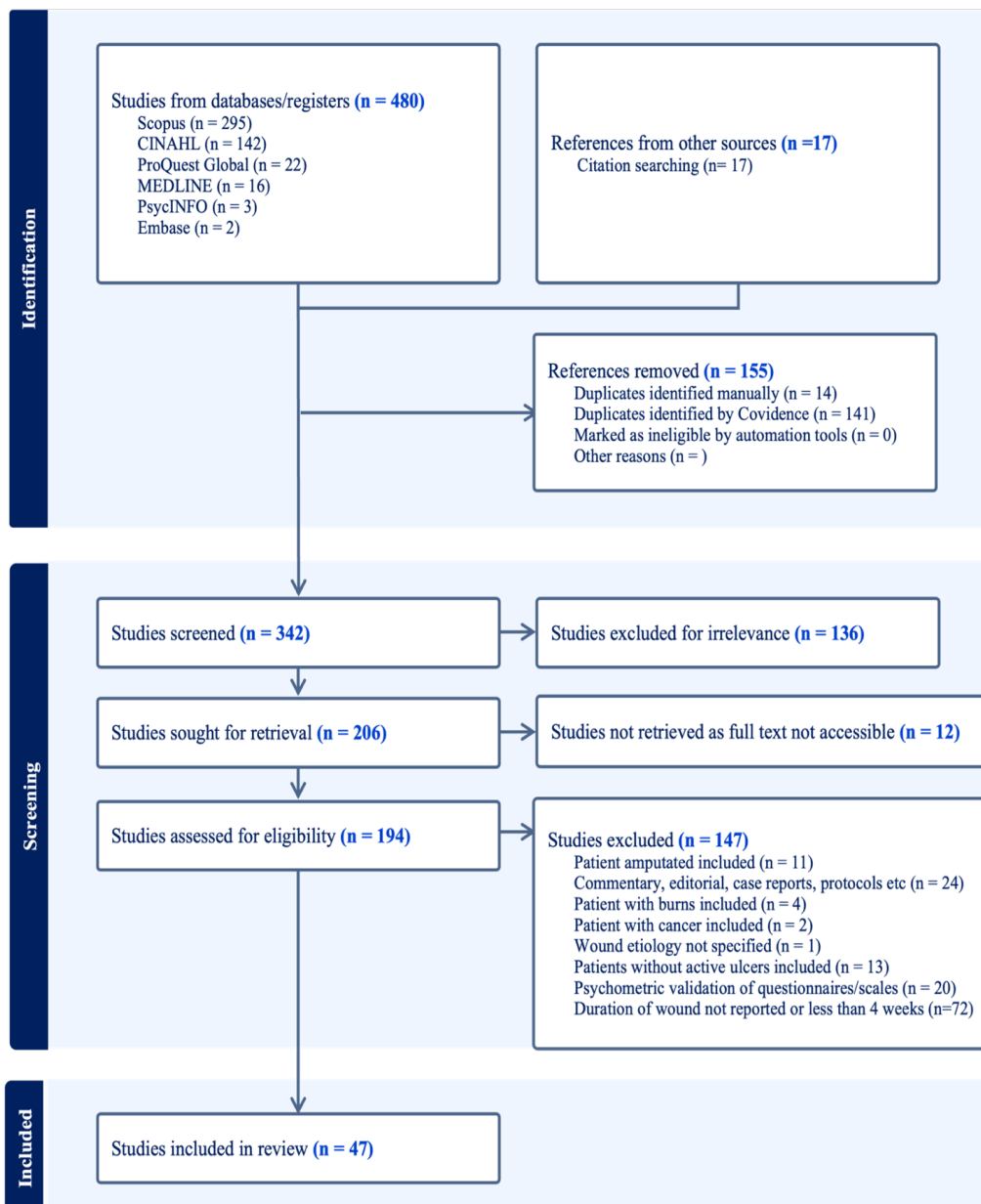


Figure 1. PRISMA flowchart for the studies included in the scoping review.

Hyperbaric oxygen therapy's effects on daily functioning are inconsistent, with beneficial⁸⁷ and adverse outcomes⁵⁷ reported, with even placebo interventions demonstrating improved physical functioning.⁶⁵

Fatigue and poor sleep

Excessive fatigue, exhaustion, lack of energy are prevalent in patients with delayed wound healing.⁴⁵ Men with leg ulcers scored higher in vitality than women.⁵⁵ Sleep disturbances, driven by pain, significantly affect QoL,⁷⁸ influencing physical functioning, role limitations, pain and general health.^{64,72}

ENVIRONMENTAL MASTERY

Explored in 12 studies, environmental mastery involves problem-solving, a sense of control and effectiveness.³⁹ In delayed wound healing, it is shaped by financial circumstances, unemployment, unanticipated events, hygiene challenges and coping mechanisms.

Financial circumstances and unemployment

Patients have reported that the financial implications associated with delayed wound healing are massive as the wounds led to a point where borrowing from friends and family was not possible anymore, making them preoccupied about immediate and longer term financial pressures.⁴⁶ Pain control was linked to economic hardship.⁸⁸ Better financial status was correlated with improved wellbeing,⁹⁰ while lower socioeconomic status worsens QoL,⁷⁹ as higher income may enhance access to care and potentially expedite the healing process.⁹⁰

Zhu et al⁴⁵ reported that most patients with delayed wound healing are employed. However, unemployment later affects many patients,⁴⁵ with some authors reporting up to 80% of patients abandoning their work.⁴⁴ Financial strain from unemployment impacts wellbeing.⁹⁰



Figure 2. Tree map of the hierarchy of Ryff's psychological dimensions addressed in patients with delayed wound healing.

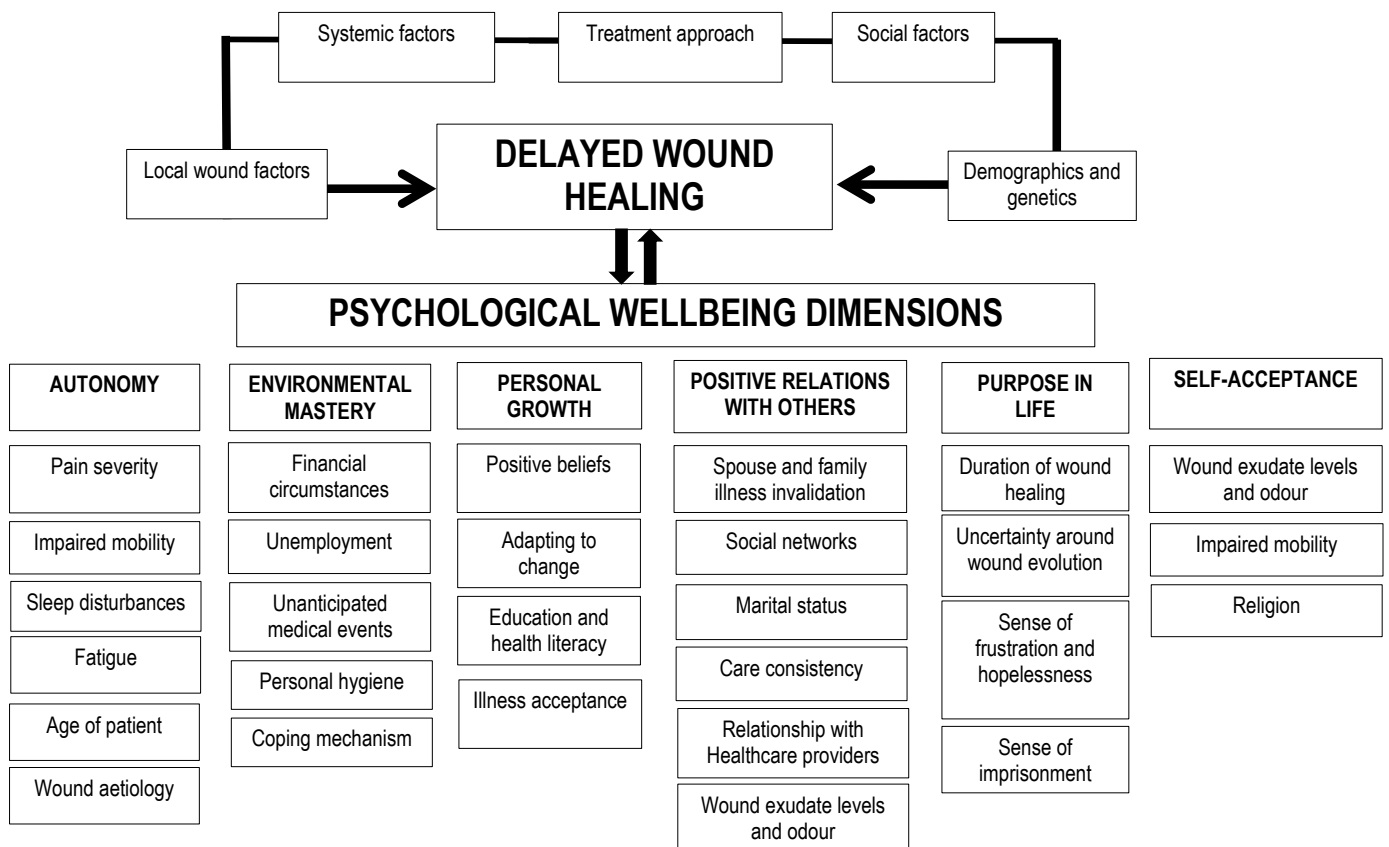


Figure 3. Schematic representation of explanatory factors associated with psychological wellbeing in patients with delayed wound healing

Unanticipated events, hygiene and coping mechanism

Events such as unpredictable visit timings and the need for unexpected surgeries, can disrupt the normal course of life for patients and their families, leading to feelings of powerlessness, as described by McCaughan et al.⁴⁶ The permanent presence of bandages and difficulty in maintaining personal hygiene causes significant distress to patients.⁴⁴

Acceptance-resignation coping styles negatively affect physical symptoms and social wellbeing.⁸² Patients who felt they had control over pain were better at reinterpreting their pain and had better physical activity levels.⁵⁸

PERSONAL GROWTH

Addressed in five studies, personal growth involves openness to new experiences, self-actualisation and a desire to keep learning.³⁹ It is influenced by positive beliefs and motivation, adaptation to change and education.

Positive beliefs and motivation

Maintaining positivity is challenging amid prolonged healing,⁴⁶ yet some patients strive to maintain a positive outlook to cope with challenges.⁴⁵ Patients who did not accept their illness were unmotivated to keep going.⁶⁴

Adapting to change

Wounds force lifestyle recalibration, altering self-perception and roles as patients need to modify their daily activities and curtail regular recreational and social activities. This requires them to find creative solutions to navigate challenges.⁴⁶

Education and health literacy

Higher educational attainment was associated with better wellbeing outcomes,⁵² however health literacy showed minimal impact on diabetic foot ulcer QoL.⁷⁷

POSITIVE RELATIONSHIPS WITH OTHERS

Covered in 16 studies, this dimension involves intimacy, empathy, trust and affection.³⁹ It is affected by social networks, family, marital status, care consistency and relationships with healthcare providers.

Social networks

Social dimensions are less affected^{64,86} as 85.7% of patients with delayed wound healing report good social relationships. Yet, embarrassment from wounds causes isolation,⁹⁰ and this isolation is worsened by depression which causes 49.6% of the variance in social life dimensions.⁸² Pain has been reported to precipitate social isolation,⁸⁸ however, social support mitigates pain's psychological impact⁶⁹ as higher support (such as living with others) is linked to better wellbeing.^{49,73}

Family relationships and marital status

Family relationships are affected as patients feel they are a burden to others because of limited physical functioning and constant requests for assistance from family members.⁴⁴ For this reason, patients sometimes conceal their emotions.⁴⁶ Spouses invalidation was higher in depressed patients⁵¹ and unmarried patients showed increased depression.⁷³

Care consistency and relationship with health care providers

Patients voiced frustrations about variations in nursing approaches and unpredictable visit timings. This led to feelings of helplessness and dissatisfaction.⁴⁶ Conversely, patients expressed satisfaction when there was consistency

in care as it fostered positive patient experiences.⁴⁶ Patients felt unheard when the care was rushed and they valued empathetic attention from their healthcare providers.⁴⁵

PURPOSE IN LIFE

Explored in eight studies, this dimension involves having goals, a sense of direction, and feeling like your life matters.³⁹ This dimension was affected by isolation, fear, hopelessness and uncertainty.

Sense of confinement and uncertainty around wound progress

Patients withdraw from the outside world, resulting in a sense of confinement within their own homes.⁴⁶ Treatment dissatisfaction and unmanaged pain breed hopelessness.^{63,88} Patients get frustrated with prolonged healing⁴⁵ as this leads to widespread fear of wound worsening.^{44,53} The uncertainty and severity of outcomes, such as limb loss, infection, hospitalisation, and even death instilled profound fear, disrupting individuals' sense of security and purpose.⁷⁷

SELF ACCEPTANCE

Five studies explored the dimension of self-acceptance³⁹ which encompasses self-respect and self-image. Patients experience low mood and depression due to an impaired sense of self from the wound-related incapacity, alongside feelings of social isolation.⁴⁶ Exudate and odour significantly restrict social contacts, leading to adverse impacts on both their social and professional lives, fostering feelings of shame, embarrassment, and heightened anxiety and depression.^{44,58} The changes in self-image and self-esteem can evoke feelings of disgust, anguish, and lifestyle constraints, with individuals potentially viewing the wound as a form of punishment from God, emphasising the influence of religiosity/spirituality on quality of life.⁹⁰ Women exhibited notably lower body image scores compared to men, with body image identified as a mediating factor between gender and QoL.⁷⁰

DISCUSSION

This scoping review aimed to answer two questions: 1) What components of psychological wellbeing have been evaluated in wound-care research and how have these been measured? 2) What internal and external factors protect and threaten the likelihood of poor psychological wellbeing in people experiencing delayed wound healing? Most studies were cross-sectional and hospital-based, commonly assessing psychological wellbeing as a sub-dimension of an overall quality of life instrument. The psychological wellbeing dimension most reportedly affected was autonomy.

Psychometric tools predominated, reflecting a broader shift in healthcare towards holistic, person-centred care.⁹³ However, some critics argue that the current mechanical use of these tools deviate from their original intent of person-centeredness.⁹⁴ The Short Form Health Survey (SF-12 items/SF-36 items) was the most commonly used measure, offering physical and mental component summaries. Though widely adopted, its validity as a comprehensive QoL measure has been questioned.⁹⁵

A total of 14 distinct tools were employed to measure psychological wellbeing, re-emphasising the inconsistencies in measuring tools as previously reported in literature.^{26,27} Despite the Hospital Anxiety and Depression Scale (HADS)

being a validated and widely available tool, none of the studies in this review utilised it. The HADS is validated across diverse populations, available in over 30 languages and assesses both depression and anxiety, which is beneficial given the frequent overlap between these conditions, allowing for separate evaluation of these two disorders.⁹⁶ Moreover, HADS has been reported as a good tool for identifying risk for non-healing, as a score above 14 correctly identified 83.1% of people with non-healing ulcers and 71.2% of people without non-healing ulcers.⁶⁶ The HADS' adequacy in assessing the full spectrum of psychological dimensions in patients with delayed wound healing remains uncertain, warranting further investigation. To address research inconsistencies and improve research quality, the adoption of core outcome sets may be essential. This has previously been used to capture wound management^{97,98} and patient experiences.⁹⁹ Core outcome sets can enhance the quality and efficiency of clinical research in wound care, by standardising reporting and facilitating evidence-based decision-making, thereby limiting the heterogeneity of psychological outcomes.¹⁰⁰

Autonomy, linked to altered mobility and pain, was the most reported psychological dimension affected in patients with delayed wound healing, often diminishing the sense of independence. This prominence partly stems from HRQoL instruments prioritising physical function constructs, especially mobility.¹⁰¹ Conversely, self-acceptance and personal growth dimensions were unexplored. Personal growth is a multidimensional construct which is fully measured only by the Personal Growth Initiative Scale-II (PGIS-II),^{102,103} unused in studies included in this review. More research on personal growth and self-acceptance, and the development of interventions fostering these dimensions are needed. Wound characteristics, like high amount of exudates and malodorous wounds impair positive relations, purpose in life and self-acceptance. While some patients have accepted wound odours and exudates as a normal part of their daily lives,¹⁰⁴ others have diminished self-worth, and have lost their usual social dynamics, due to feelings of shame and embarrassment.^{44,76} Though multiple wound assessment tools exist, a Delphi consensus study has recommended the use of bacterial burden-based tools,¹⁰⁵ vital in African settings where wounds are significantly colonised by very resistant pathogens.¹⁰⁶ In spite of the fact that healthcare providers have been reported to lack confidence with respect to the current availability and usage of topical interventions to manage odour,¹⁰⁷ the effect of wound odour and exudate on multiple psychological dimensions suggests that efficient interventions managing wound odour and exudate may greatly improve psychological wellbeing.¹⁰⁸⁻¹¹⁰

Ageing brings with it, grief and isolation, potentially impacting psychological wellbeing,¹¹¹ however, younger patients reported greater alterations in psychological wellbeing,⁹¹ possibly due to differences in lifestyle and disrupted life expectations, as younger patients are generally non-sedentary and enjoy social participation, which are opposed to the older patient's established routines.^{112,113} Gender's role in psychological wellbeing yielded conflicting evidence,^{90,114} with a Spanish study suggesting self-concept traits and personality, outweigh biological sex.¹¹⁵ Arterial and venous ulcers were associated with greater alterations in psychological wellbeing possibly because these wounds are often associated with high symptom burden (such as pain, pruritus, malodour and high

exudate),¹¹⁶ with over half of patients experiencing repeated recurrence within 12 months of healing¹¹⁷ further emphasising the burden of leg ulcers on patients.

Despite evidence favouring community-based nurse-led care,^{118,119} hospital-based research still dominates, prioritising accessibility to resources and expertise¹²⁰ but overlooking community and rural psychological needs.¹²¹ Rural residents exhibit poorer health outcomes, engage in less healthy behaviours, and experience higher mortality rates compared to their urban counterparts.¹²² This gap is further highlighted by the lack of studies from the African continent. Moreover, this review did not identify any psychological interventions, which may reflect current evidence but may possibly result from the search limits and focus of this review.

Limitations of this review include the search restrictions, single reviewer data extraction, and the predominance of cross-sectional designs, risking misinterpretation and limiting temporal analysis of factors influencing psychological wellbeing. Also, the capture of psychological wellbeing concepts qualitatively deviates from Ryff's original quantitative questionnaire, possibly increasing the risk of misinterpretation. Longitudinal studies using electronic health records (EHRs)^{123,124} could offer a cost-effective and expedited approach to generating accurate and reliable evidence, leveraging machine learning to analyse trends and personalise interventions.¹²⁵⁻¹²⁷ Integrating psychological assessments into routine wound care could proactively identify at-risk patients, enabling timely interventions and ultimately improve patient outcomes.¹²⁸

Despite these constraints, this review used a systematic approach and thorough search strategy to retrieve evidence and to the best of our knowledge, is the only study using an established framework, like Ryff's model, for analysing psychological wellbeing in patients with delayed wound healing, setting a benchmark for future studies.

CONCLUSION

This scoping review investigated the psychological impact of delayed wound healing, highlighting a complex interplay between physical health and psychological wellbeing. While QoL emerged as a frequently assessed concept, autonomy stood out as the most extensively reported psychological dimension, revealing a disparity in the exploration of other dimensions, like self-acceptance, personal growth and purpose in life.

IMPLICATIONS FOR CLINICAL PRACTICE

- The identified gaps in psychological assessment protocols for delayed wound healing suggest that current practices may benefit from incorporating multidimensional wellbeing measures, particularly those capturing autonomy, self-acceptance, and purpose in life, to better align with patient-reported experiences.
- Emerging evidence on the bi-directional relationship between psychological distress and impaired healing emphasises the potential clinical value of integrating psychosocial support with standard wound care to address this interplay.

IMPLICATIONS FOR FUTURE RESEARCH

- The substantial heterogeneity in measurement tools observed in this review highlights an urgent need for international consensus on psychological core outcomes, which would enable robust cross-study comparisons and meta-analyses in wound care research.
- The striking geographic disparities in available evidence present a critical opportunity for large-scale, culturally adapted cohort studies to elucidate how socioeconomic and healthcare system factors modulate psychological outcomes in delayed healing.

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AUTHOR CONTRIBUTIONS

EMM: Conceptualisation; data curation; writing (original and draft); reviewing and editing. **VC:** Conceptualisation; validation; project administration; supervision; reviewing and editing. **C-DG:** Conceptualisation; supervision; project administration; review and editing.

CONFLICT OF INTEREST

The authors declare no conflict of interest

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study; all supporting data are available within manuscript.

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