



## Original Research Article

## A clinicoepidemiological study of chronic and recurrent leg ulcers

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## ABSTRACT

**Background:** Chronic leg ulcers (CLU) are chronic diseases, which are associated with significant morbidity and exert health burden on the patients. Varied heterogeneity in the type of aetiology, risk factors, and comorbidities have been observed in individuals with CLU.

**Materials and Methods:** A prospective, cross-sectional, observational type of descriptive study carried out in the department of Dermatology, Venereology and Leprosy at a tertiary care teaching hospital in Navi Mumbai. Adult patients with clinical evidence of chronic leg ulcer were enrolled. Patient's quality of life (QOL) was assessed by Dermatology Life Quality Index (DLQI) scale.

**Results:** The mean age of the sample was  $42.07 \pm 9.3$ . The male to female ratio was 1.38:1. The most common occupation encountered was farmers (35%), followed by housewives (13%), shopkeepers (8%), cook & students (7%). Around 76 % of the patients of leg ulcer were having associated co-morbidities among which Diabetes was commonly encountered. The most common etiological diagnosis were venous ulcers (31%), followed by diabetic ulcer (26%), trophic ulcers (25%), traumatic ulcer (7%), leucocytoclastic vasculitis (7%), arterial ulcer and pyoderma gangrenosum (4%). The leg ulcer had adversely impacted the QOL ranging from moderately to extremely large with majority (80%) of the patients having very large impact on QOL.

**Conclusion:** Chronic leg ulcers are long term conditions with varying aetiologies and risk factors. They are associated with significant impairment of patient's quality of life.

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## 1. Introduction

Chronic leg ulcers (CLUs) are a significant health concern due to their prevalence and impact on patients' lives. CLU is defined as a skin ulcer persisting for more than six weeks below the knee without signs of healing. It poses a substantial health burden for both patients and healthcare providers.<sup>1,2</sup>

Studies estimate CLU affects 0.45% to 5% of the population, with higher prevalence among individuals with vascular and metabolic illnesses and older age groups.<sup>1,2</sup>

The etiology of CLU is diverse, with varied risk factors and comorbidities observed across different populations.<sup>1,3–6</sup> CLU can stem from various causes, including venous ulceration, trophic ulceration (particularly common in regions like India with high leprosy prevalence), and other underlying conditions.

CLUs are notoriously difficult to treat, and successful management often hinges on addressing the underlying cause or etiology. Quality of life (QOL) has become increasingly important in managing chronic medical conditions like CLU. The physical symptoms of ulcers, as well as their impact on functional ability, mobility, social interactions, employment, and economic status,

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significantly affect patients' QOL.<sup>7</sup>

Despite evidence of declining QOL associated with CLUs, practitioners in wound-focused care often overlook the broader impact of ulceration on patients' lives.<sup>7</sup> Understanding the clinical and etiological aspects of CLU, along with its impact on QOL, is crucial for developing effective therapies and improving patient outcomes.<sup>7</sup>

## 2. Materials and Methods

This was a Prospective, cross sectional, observational, carried out in the Department of Dermatology, Venereology, and Leprosy at Tertiary Medical Hospital, Navi Mumbai. Patients attending the dermatology Outpatient department with chronic ulcers were prospectively approached and patients fulfilling the inclusion and exclusion criteria were included after obtaining informed consent.

A pre-designed case record form (CRF) was used to record various aspects of each patient's information systematically. This included demographic characteristics, clinical examination findings related to the ulcer, investigation details, quality of life assessment, and diagnosis.

The modified Dermatology Life Quality Index (DLQI) scale was employed to assess the impact of chronic leg ulcers on patients' quality of life. This scale consists of 10 questions divided into 6 domains, with responses rated on a Likert scale.<sup>8–10</sup>

### 2.1. Statistical analysis

Data was analyzed and statistically evaluated using SPSS software, version 25 (Chicago II, USA).<sup>11</sup> Quantitative data was expressed in mean and standard deviation while qualitative data was expressed in percentage. The ANOVA followed by post hoc analysis with the Bonferroni test was used to compare the variables. P value less than 0.05 was considered statistically significant.

### 2.2. Ethical issues

All participants were explained about the purpose of the study. Confidentiality was assured to them along with informed written consent. The study was approved by the Institutional Ethical Committee.

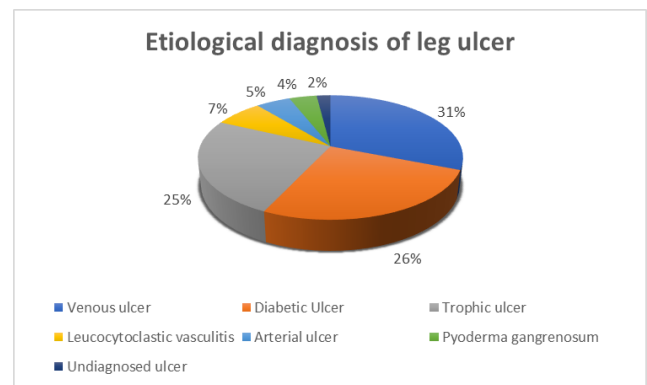
## 3. Results

In this study, a total of 100 patients suffering from leg ulcers were enrolled. The mean age of the sample was  $42.07 \pm 9.3$ . The male-to-female ratio was 1.38:1. The majority of patients with leg ulcers were observed in the age group of 35-44 years (51%) and male predominance (40%) was observed. The most common occupation encountered

was Farmers (35%), followed by housewives (13%), shopkeepers (8%), cooks and students (7%) respectively. In this study, 21 % of patients were smokers and 79% were non-smokers, while 23 % were alcoholic and 77% were non-alcoholics.

In this study, 82 % of the patients were having associated co-morbidities. Diabetes was the most common associated co-morbidity encountered in this study. Majority of the patients had painful ulcers, serous and scanty discharge while past history of ulcers was present in 39% patients.

The most common etiological diagnoses were venous ulcer (31%), diabetic ulcer (26%) followed by trophic ulcers (25%), leucocytoclastic vasculitis (7%), arterial ulcer (5%), and pyoderma gangrenosum (4%) respectively.



Graph 1: Etiological diagnosis of the leg ulcers



Figure 1: Trophic ulcer on the plantar aspect of the foot

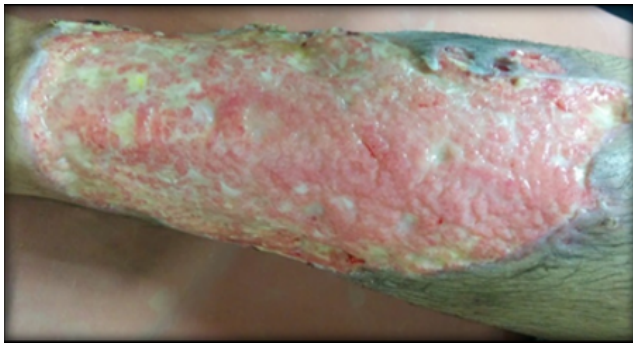
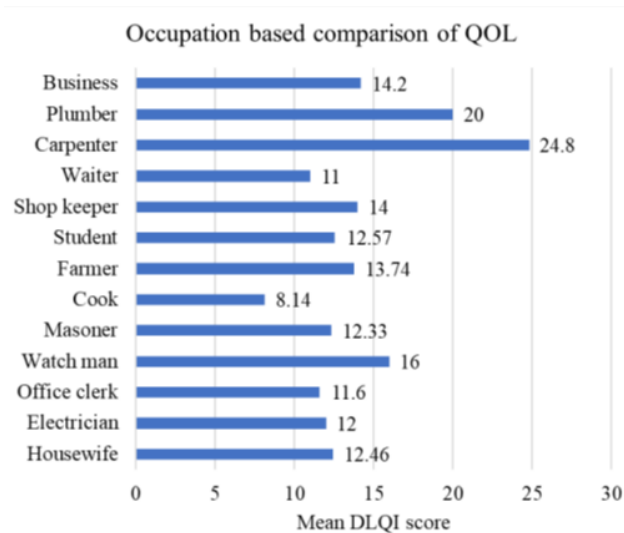


Figure 2: Pyoderma gangrenosum

The mean total Quality of life (DLQI) score in patients with leg ulcer was 13.67. Here, the leg ulcer had adversely impacted the QOL ranging from “moderately” to “extremely large:” with majority (80%) of the patients having a “very larg “ impact on QOL.

On comparing the DLQI scores between genders, there was no statistically significant difference found between them. The QOL when comparing male and female patients were similar.

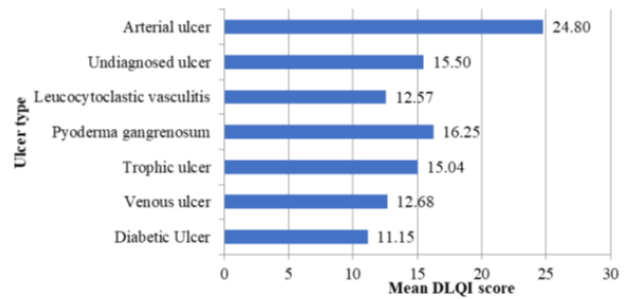
Again, on comparing the DLQI scores between occupations of patients with leg ulcers, there was a statistically significant difference found. On further subgroup analysis, it was found that QOL of Carpenter and plumbers were extremely affected in comparison to other occupations of patients with leg ulcers. (Graph 2)



Graph 2: Occupation based comparison of QOL

The DLQI score of arterial ulcers, Pyoderma gangrenosum and Trophic ulcers were 24.8, 16.25 and 15.04, respectively, on the higher side reflecting poor quality of life. On comparing the DLQI scores between etiological diagnosis of leg ulcers, there was a statistically

### Etiological diagnosis based comparison of QOL



Graph 3: Etiological diagnosis-based comparison of QOL

significant difference found ( $P < 0.001$ ) between them. Patients with Arterial leg ulcer had extremely large adverse impact on QOL.(Graph 3, Table 1)

### 4. Discussion

The management of chronic leg ulcers is complex, and ranges from medical therapy to surgical interventions and often a therapeutic challenge.<sup>1</sup> Understanding the clinical patterns, etiological factors, and the impact of chronic leg ulcers on quality of life is crucial for developing effective therapies.

While the peak age of presentation for CLU in the study was 35-44 years, which aligns with previous findings by Rahman et al. and Dalai et al.<sup>12</sup>

These findings however contradicted other studies (Baker et al, Vamsidhar et al, Wachholz et al, McDaniel et al, Narendra et al) that reported an increase in CLU incidence with increasing age.<sup>7,13–15</sup>

While studies (Baker et al, Jockenhöfer et al, Scotton et al) from developed countries often reported a higher prevalence of CLU in females, this study found a higher proportion of CLU in males.<sup>16</sup> which were similar to the gender distribution patterns were observed in studies conducted by Dalai et al.,<sup>12</sup> Vamsidhar et al.,<sup>13</sup> and Narendra et al.<sup>15</sup>

Farmers (35%) were the most common occupational group among patients with CLU, followed by housewives (13%), shopkeepers (8%), cooks, and students (7%). This distribution differed from findings by Nag et al.,<sup>11</sup> who reported higher proportions of laborers, shopkeepers, housewives, and barbers among CLU patients.

Diabetes, varicose veins, and leprosy were identified as the most commonly associated comorbidities in patients with CLU in the study which aligns with previous research by Kaliyaperumal,<sup>17</sup> which also reported a high prevalence of CLU as a complication of these diseases.

Studies [Nelzén et al., (1993, 1997)<sup>7</sup> and Pien et al.,<sup>18</sup> have also showed that patients with diabetes are

**Table 1:** Etiological diagnosis-based comparison of QOL

Etiological diagnosis	N	Mean DLQI score	Standard deviation	F value	P value
Venous ulcer	31	12.67	1.66	28.99	<0.001
Diabetic ulcer	26	11.15	3.02		
Trophic ulcer	25	15.04	2.52		
Pyoderma Gangrenosum	4	16.25	0.50		
Leucocytoclastic vasculitis	7	12.57	1.27		
Undiagnosed ulcer	2	15.50	2.12		
Arterial ulcer	5	24.80	0.83		

more frequently affected by CLU, with macroangiopathy often being a contributing factor to slow or non-healing ulcers.<sup>19</sup> Additionally studies by McDaniel et al.,<sup>14</sup> showed that patients with deep venous insufficiency, a common complication of varicose veins, have been associated with higher recurrence rates of CLU compared to those without this condition.

The variability in the prevalence of associated comorbidities among CLU patients across different studies may be attributed to geographical location and clinical conditions which is clearly corroborated by the fact that studies conducted in India by Dalai et al.,<sup>12</sup> Vamsidhar et al.,<sup>13</sup> and Sharma et al.,<sup>15</sup> have shown similar patterns of comorbidities but may vary from studies conducted in other regions due to differing healthcare practices, patient demographics, and environmental factors. The study found that CLU had a significant negative impact on patients' quality of life, as evidenced by high scores on the Dermatology Life Quality Index (DLQI) [mean 13.67 ± 3.74].

Previous research has also highlighted the adverse effects of CLU on various aspects of patients' lives, including pain, emotional reactions, social isolation, physical restrictions while in this study it was correlated with time lost from work ( $p < 0.001$ ), job loss ( $p < 0.01$ ), and financial strain ( $p < 0.02$ ).

The mean DLQI score in this study ( $13.67 \pm 3.74$ ) was comparable to studies [Kouris et al., (2014, 2016), Altunay et al., (2016)] indicating a consistently high impact of CLU on QOL across different populations.<sup>7,9,10</sup> Patients with venous ulcers, arterial ulcers, pyoderma gangrenosum, trophic ulcers, and undiagnosed ulcers experienced particularly poor QOL, emphasizing the need for tailored management approaches for different types of ulcers.

In this study, the CLU had adversely impacted the QOL ranging from “moderately” to “extremely large:” with majority (80%) of the patients having “very large “impact on QOL. The proportion of patients having moderate to high impact on quality of life was higher in this study compared to studies conducted by and Wachholz et al.,<sup>7</sup> and Cunha et al.,<sup>7</sup> authors.<sup>7</sup> Certain occupations, such as carpenters and plumbers, were associated with significantly higher DLQI scores above 20.

CLU management requires a comprehensive approach, including detailed history-taking, physical examination, appropriate investigations, and tailored treatment plans. Doppler imaging is recommended, particularly in patients with venous ulcers, to assess venous incompetence and monitor disease progression.

While dermatologists play a key role in CLU diagnosis and treatment, a multidisciplinary team is often necessary to optimize therapy and improve patient outcomes. Shifting the focus from ulcer wound treatment to addressing the specific needs of patients in the context of their impaired QOL is essential in CLU management.

CLU is a long-term condition with diverse etiologies and risk factors that significantly impair patients' quality of life. Effective management requires a holistic approach, collaboration among healthcare professionals, and a focus on improving patients' overall well-being.

## 5. Conclusion

Chronic leg ulcers are long-term conditions with varying aetiologies and risk factors. The most common etiological were diabetic ulcers and venous ulcers.

The need of the time is to shift the focus to understanding the underlying causes and the specific needs of patients within the broader context of their quality of life. This approach can lead to more comprehensive and effective treatment strategies that not only promote wound healing but also improve overall well-being. It reflects a patient-centered approach that prioritizes holistic care and recognizes the importance of addressing both the physical and emotional aspects of living with chronic leg ulcers.

## 6. Conflicts of Interest

The authors declare no conflicts of interest.

## 7. Source of Funding


None.

## References


1. Agale SV. Chronic Leg Ulcers: Epidemiology, Aetiopathogenesis, and Management. *Ulcers*. 2013;2013:1–9. doi:10.1155/2013/413604.

2. Kahle B, Hermanns HJ, Gallenkemper G. Evidence-based treatment of chronic leg ulcers. *Dtsch Arztebl Int.* 2011;108(14):231–7.
3. Barker J, Bleiker T, Chalmers R, Creamer D, editors. Rook's Textbook of Dermatology, 9th edn. vol. 4696. Wiley-Blackwell; 2016.
4. Lepántalo M, Apelqvist J, Setacci C, Ricco JB, De Donato G, Becker F, et al. Chapter V: Diabetic foot. *Eur J Vasc Endovasc Surg.* 2011;42(Suppl 2):60–74.
5. Anders J, Heinemann A, Leffmann C, Leutenegger M, Pröfener F, Renteln-Kruse WV, et al. Decubitus ulcers: pathophysiology and primary prevention. *Dtsch Arztebl Int.* 2010;107(21):371–82.
6. Baker SR, Stacey MC. Epidemiology of chronic leg ulcers in Australia. *Aust N Z J Surg.* 1994;64(4):258–61.
7. Nelzén O, Bergqvist D, Lindhagen A. High prevalence of diabetes in chronic leg ulcer patients: a cross-sectional population study. *Diabet Med.* 1993;10(4):345–50.
8. Chernyshov PV. The Evolution of Quality of Life Assessment and Use in Dermatology. *Dermatology.* 2019;235(3):167–74.
9. Dermatology Life Quality Index - School of Medicine - Cardiff University [Internet]. Available from: <https://www.cardiff.ac.uk/medicine/resources/quality-of-life-questionnaires/dermatology-life-quality-index>.
10. Lindholm C, Bjellerup M, Christensen OB, Zederfeldt B. Quality of life in chronic leg ulcer patients. An assessment according to the Nottingham Health Profile. *Acta Derm Venereol.* 1993;73(6):440–3.
11. Vamsidhar L, Penchalaiah G, Srilekha A. A clinical study of ulcers of the leg: A prospective comparative study. *Int J Surg Sci.* 2019;3(3):325–9.
12. Kaliyaperumal D, Jagadeeshkumar G, Kanagaraj P, Chandran V. Clinico-epidemiological study of chronic leg ulcers in a tertiary care referral center from Tamil Nadu, India. *Int J Res Dermatol.* 2021;7(3):445–9.
13. Wachholz PA, Masuda PY, Nascimento DC, Taira CM, Cleto NG. Quality of life profile and correlated factors in chronic leg ulcer patients in the mid-west of São Paulo State, Brazil. *An Bras Dermatol.* 2014;89(1):73–81.
14. Narendra JB, Thakkannavar V. Chronic Leg Ulcers: Clinico-Etiological Study. *IOSR J Dent Med Sci.* 2016;15(11):27–31.
15. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. *Clin Exp Dermatol.* 1994;19(3):210–6.
16. Dalai P, Behera S, Muduli N. Study of aetiopathogenesis of chronic leg ulcers. *J Med Sci Clin Res.* 2020;8(5):543–9.
17. Nag F, Chatterjee G, Ghosh A, De A. Clinico etiological evaluation of chronic leg ulcer in a tertiary care center of eastern India. *Indian J Dermatol.* 2020;65(6):495–9.
18. Mcdaniel HB, Marston WA, Farber MA, Mendes RR, Owens LV, Young ML, et al. Recurrence of chronic venous ulcers on the basis of clinical, etiologic, anatomic, and pathophysiologic criteria and air plethysmography. *J Vasc Surg.* 2002;35(4):723–8.
19. Pien FD, Kistner RL, Partsch B, Kusumawati L, Osako T, Galagan RC, et al. Retrospective study of hospitalized patients with chronic leg ulcers in Hawaii. *J Foot Ankle Surg.* 1994;3(6):546–50.

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