Health-related quality of life in cutaneous T-cell lymphoma: A cross-sectional survey study

M.M. Shinohara¹ | H.M. Mahurin² | E. Tarabadkar³ | D.S. Hippe⁴ | K. Lachance¹ | E.J. Kim⁵ | E.T. Loggers⁶⁷

¹Division of Dermatology, University of Washington, Seattle, Washington, USA
²School of Medicine, University of Washington, Seattle, Washington, USA
³Department of Dermatology, Emory University, Atlanta, Georgia, USA
⁴Department of Radiology, University of Washington, Seattle, Washington, USA
⁵Department of Dermatology, University of Pennsylvania, Philadelphia, Pennsylvania, USA
⁶Clinical Research Division, Fred Hutchinson Cancer Research Center, Seattle, Washington, USA
⁷Division of Hematology/Oncology, Department of Medicine, University of Washington, Seattle, Washington, USA

Correspondence
Michi M. Shinohara, Dermatology and Dermatopathology, University of Washington, Box 356524, BB1332E, Seattle, WA 98195, USA.
Email: mshinoha@uw.edu

Funding information
Michael Piepkorn Endowed Chair in Dermatology Research; Merkel Cell Carcinoma Gift Fund

Summary

Background: Patients with cutaneous T-cell lymphoma (CTCL) often have indolent but symptomatic disease.

Objective: Assessment of the health-related quality of life (HRQoL) of patients with CTCL.

Methods: Cross-sectional survey study. HRQoL was measured by Skindex-16 and FACT-G.

Results: A total of 372 responses were received; 80 incomplete/ineligible responses were excluded. A majority of respondents identified as white (87%; 250/288) and female (67%; 193/286) with a mean age of 57 ± 14 years. Most patients had early-stage (IA–IIA) (74%; 162/203) mycosis fungoides (87%; 241/279). There were 33 (12%; 33/279) patients with Sézary syndrome. Mean itch score (visual analogue scale; VAS) was 3.2 ± 2.8, overall; 2.7 ± 2.6 for early, and 4.2 ± 2.9 for advanced disease (p = 0.008). Thirty-eight percent (108/284) and 24% (69/284) reported head/neck and groin/genital involvement, respectively. Overall HRQoL was 46 ± 27 (Skindex-16) and 71 ± 19 (FACT-G), with worse HRQoL for patients with advanced versus early disease (Skindex-16: 67 vs. 40; p<0.001, FACT-G: 62 vs. 76; p = 0.001). Predictors of worse HRQoL included head/neck, hand/foot or groin/genital involvement, younger age and spending >15 min daily treating CTCL.

Limitations: Include anonymous survey methodology, underrepresentation of certain CTCL subtypes and non-white respondents.

Conclusions: Patients with CTCL, particularly those with advanced disease or involvement of the head/neck, acral or groin/genital sites, experience significant impact on HRQoL.

1 | INTRODUCTION

Most patients with cutaneous T-cell lymphoma (CTCL) live with their disease for years or even decades. Symptom burden in CTCL can be significant, with as many as 88% reporting pruritus in the previous month.¹ A growing body of literature supports the impact of skin disease on health-related quality of life (HRQoL). Chronic skin diseases can cause significant psychological and social distress such as depression and fear of stigma,² while the disability experienced by patients with psoriasis is comparable to that of chronic illnesses such as heart disease and diabetes.³ Cancer also negatively impacts HRQoL in patients, even for
survivors. For example, survivors of non-Hodgkin lymphoma have worse HRQoL compared to age and
sex-matched normative controls.5,6

The Cutaneous Lymphoma Foundation (CLF) is an independent, non-profit patient advocacy organization
dedicated to supporting people affected by cutaneous lymphoma (https://www.clfoundation.org/about-us). A
large-scale study done in 2005 by Demierre et al. in partnership with the CLF found that CTCL has a pro-
found impact on HRQoL, with worse HRQoL reported for more advanced disease.7 We partnered with the
CLF to examine QoL in patients with CTCL, with a focus on physical, social and emotional well-being. We
hypothesized that despite advances in CTCL therapy since the work of Demierre et al. more than 15 years
ago, patients with CTCL still experience lower HRQoL. We also examined skin involvement, time since
diagnosis and itch severity on HRQoL for those with CTCL.

2 | MATERIALS AND METHODS

A cross-sectional, anonymous electronic survey was
administered between February and April 2019. The
survey was distributed via a link posted on the CLF
Facebook page and email lists. At the time of distribu-
tion, the CLF Facebook group had approximately 1900
members, while the email listerv had approximately
1200 members. The study team did not directly access
membership lists. Survey responses were collected and
managed using REDCap electronic data capture tools
hosted at the University of Washington.8,9 This study
was determined to be exempt from institutional review
board review by the University of Washington Human
Subjects Division (STUDY00005784).

Independent measures included demographics, CTCL
type and stage, time since diagnosis, and co-
morbid conditions (adapted from the self-reported
Charlson Comorbidity Index10). Four independent
measures, three of which were similar to those in
Demierre's original study and one novel question, assessed the emotional and financial burden of CTCL
(collectively termed the ‘Burden Score’). Itch was
measured using VAS. Two validated HRQoL in-
struments were included: Skindex-1611 and Functional
Assessment of Cancer Therapy: General (FACT-G).12
Skindex-16 scores were calculated per Chren et al.’s11
transforming responses to a linear scale from 0 to 100.
Total score and subscale scores were considered valid
if at least 70% of the items had responses. Missing
items in each subscale were imputed with the mean of
the non-missing items in that subscale. FACT-G scores
were calculated according to the FACT-G Scoring
Guidelines Version 4. Scores were calculated for each
subscale and summed together to derive the total
score, with a range of 0–108 (with lower scores
indicating worse HRQoL). Subscale scores were
considered valid if >50% of the items had responses (i.
e., ≥4 of 6 or 7 items per subscale). The total score was
considered valid if >80% (≥22 of 27 items) had re-
sponses and all subscales were valid. Missing items in
each subscale were imputed using the mean of non-
missing items in that subscale.

HRQoL scores and demographic variables were
compared between these groups using the Wilcoxon
rank-sum test or Fisher’s exact test. Linear regression
models were used to examine mean differences in
Skindex-16 or FACT-G. p-Values less than 0.05 were
considered statistically significant. B-values are mean
differences in Skindex-16 or FACT-G per change in the
corresponding variable; estimates were derived using
linear regression models. All statistical analyses were
performed using STATA (version 14.0; StataCorp) and
R software (version 4.0.0; R Foundation for Statistical
Computing).

3 | RESULTS

A total of 372 responses were received. Response rate
could not be calculated due to the survey distribution
methods, but is estimated between 12% and 30% based
on the maximum (3100) and minimum (1240) number
of patients who could have viewed the survey link.
Seventy-three respondents who stopped prior to the
end of the survey (19.6%) and seven (1.7%) additional
responses from patients with cutaneous B-cell lym-
phoma (CBCL) were excluded from the final analysis,
leaving 292 participants. Demographics of this cohort
are summarized in Table 1. A majority identified as
white (87%; 250/288) and female (66%; 190/286).
Respondent age ranged from 24 to 92 years, with a
mean of 57 ± 14 years. Among all respondents, 76%
(209/276) had completed at least an undergraduate
**TABLE 1** Demographics of study cohort (N = 292 unless otherwise indicated)

| Variable                                                                 | Number (%a) (or Mean ± SD) |
|--------------------------------------------------------------------------|-----------------------------|
| **Gender**                                                               |                             |
| Female                                                                   | 190 (66.2)                  |
| Male                                                                     | 95 (33.1)                   |
| Other                                                                    | 2 (0.7)                     |
| Age, mean (range 24–92 years)                                           | 57 ± 14                     |
| **Race/ethnicity**                                                      |                             |
| Asian                                                                    | 2 (0.7)                     |
| American Indian or Alaska Native                                        | 2 (0.7)                     |
| Black or African American                                               | 12 (4.2)                    |
| Hispanic or Latino                                                       | 12 (4.2)                    |
| Native Hawaiian or other Pacific Islander                                | 0 (0.0)                     |
| White                                                                    | 250 (86.8)                  |
| Other                                                                    | 7 (2.4)                     |
| Multiple races                                                           | 3 (1.0)                     |
| Married or in a domestic partnership                                     | 208 (72.0)                  |
| **Location**                                                            |                             |
| Inside United States                                                     | 213 (75.3)                  |
| Outside United States                                                    | 70 (24.7)                   |
| **Education**                                                           |                             |
| High school or less                                                      | 67 (24.3)                   |
| Associate's or Bachelor's degree                                         | 130 (47.1)                  |
| Graduate or professional degree                                          | 79 (28.6)                   |
| **Employment**                                                          |                             |
| Disabled                                                                 | 23 (7.7)                    |
| Employed                                                                 | 130 (45.5)                  |
| Student                                                                  | 6 (2.1)                     |
| Retired                                                                  | 118 (41.3)                  |
| Unemployed                                                               | 11 (3.8)                    |
| Work from home/homemaker                                                | 22 (7.7)                    |
| **Health insurance/coverage status**                                     |                             |
| Commercial insurance                                                     | 174 (59.2)                  |
| Medicare                                                                 | 99 (33.7)                   |
| Other                                                                    | 43 (14.6)                   |
| Medicaid                                                                 | 17 (5.8)                    |
| No insurance or coverage                                                | 17 (5.8)                    |
| Veterans Affairs or Tricare                                             | 9 (3.1)                     |
| Charity care                                                             | 2 (0.7)                     |
| **Self-reported comorbid medical condition**                            |                             |
| None                                                                     | 189 (64.7)                  |
| 1 or more                                                                | 103 (35.2)                  |

(Continues)
TABLE 1 (Continued)

| Variable                                      | Number (%) (or Mean ± SD) |
|-----------------------------------------------|---------------------------|
| Time since diagnosis                          |                           |
| <1 year                                       | 63 (21.6)                 |
| 1-5 years                                     | 126 (43.2)                |
| >5 years                                      | 103 (35.3)                |
| Type of CTCL (multiple options)               |                           |
| Mycosis fungoides (MF)                        | 241 (86.7)                |
| Sézary syndrome (SS)                          | 33 (11.9)                 |
| pcALCL or LyP                                 | 26 (9.4)                  |
| Othera                                        | 2 (0.7)                   |
| Stage, MF/SS                                  |                           |
| Early (IA–IIA)                                | 162 (79.8)                |
| Advanced (IIB–IVB)                            | 41 (20.2)                 |
| Itch score (VAS)                              | 3.2 ± 2.8                 |
| Early (IA–IIA)                                | 2.7 ± 2.6                 |
| Advanced (IIB–IVB)                            | 4.2 ± 2.9                 |
| Areas of body involved (multiple options)     |                           |
| Legs                                          | 186 (65.5)                |
| Arms                                          | 168 (59.2)                |
| Chest or sides                                | 163 (57.4)                |
| Back                                          | 150 (52.8)                |
| Buttocks                                      | 157 (55.3)                |
| Head/neck                                     | 108 (38.0)                |
| Feet                                          | 98 (34.5)                 |
| Hands                                         | 78 (27.5)                 |
| Groin/genitals                                | 69 (24.3)                 |

Notes: Total number may not equal 292 due to incomplete responses. p = 0.008.
Abbreviations: CTCL, cutaneous T-cell lymphoma; LyP, lymphomatoid papulosis; pcALCL, primary cutaneous anaplastic large cell lymphoma; SD, standard deviation.
aRespondents who did not provide a value were excluded from the corresponding summary: gender (n = 5), age (n = 9), race/ethnicity (n = 4), marital status (n = 3), location (n = 9), education (n = 16), employment (n = 6), insurance status (n = 1), type of CTCL (n = 14), stage (n = 73), itch score (n = 8) and area of body involved (n = 8).
bIncludes items from the Charleston Comorbidity Index: myocardial infarction; heart failure; peripheral vascular disease; chronic obstructive lung disease; emphysema; stomach ulcers; liver disease; hepatitis; stroke/mini-stroke; hemiplegia; dementia; rheumatoid arthritis; lupus, scleroderma, Sjögren’s, or connective tissue disease; other joint/bone problems; series kidney problems; and diabetes.
cOther types of CTCL = subcutaneous panniculitis-like T-cell lymphoma, primary cutaneous peripheral T-cell lymphoma.

degree, and most had commercial insurance (59%; 174/290) followed by Medicare (34%; 99/290). The most common reported medical comorbidity of the cohort was bone or joint problems (16%; 48/292). Diabetes mellitus was the second most common (10%; 30/292), while chronic obstructive pulmonary disease and heart disease each affected approximately 5% of the cohort.

The majority (65%; 189/292) of patients had been diagnosed with their CTCL within the previous 5 years. Mycosis fungoides (MF) was the most common type of CTCL (87%; 241/278), followed by Sézary syndrome (SS) (12%; 33/278) and CD30 lymphoproliferative disorders (LPDs) (9%; 26/278). Among patients with MF/SS who reported their stage (n = 203, 70%), the majority (80%; 162/203) had early-stage disease (IA–IIA). The extremities (legs/arms), trunk and buttocks were the most commonly reported sites of involvement (Table 1); 38% (108/284) reported involvement of the head/neck, and 24% (69/284) reported involvement of the groin/genitals. The mean itch score (VAS) of the
entire cohort was 3.2 ± 2.8, 2.7 ± 2.6 for those with early-stage MF/SS, and 4.2 ± 2.9 for those with late-stage MF/SS (p = 0.008). Results from the Burden Score items are reported in Table 2.

The majority (74%; 215/289) of patients reported spending <60 min daily treating their CTCL (including application of topical treatments, appointments, infusions), with most (38%; 109/289) spending <15 min daily and 26% (74/289) spending >60 min daily. 15% (42/289) spend over 2 h daily. Over half (52%; 152/292) of the respondents indicated that they received help from a caregiver or family member for their CTCL.

Mean overall Skindex-16 and FACT-G scores and scores for MF/SS by stage are shown in Table 3. Association of HRQoL as measured by Skindex-16 and FACT-G is shown in Tables 4 and 5, respectively. Age, advanced stage, higher itch scores by VAS, head/neck, groin/genital or acral involvement were all significantly associated with worse HRQoL in both instruments, as were requiring help from a caregiver, spending >15 min daily treating CTCL (vs < 15 min daily), each of the independent measures of the Burden Score and the overall Burden Score. Time since diagnosis of CTCL (within 1 year vs. longer) was not significantly associated with HRQoL by either instrument. Patients who reported groin/genital involvement had lower satisfaction with their sex life as assessed by FACT-G, with 46% (25/54) of patients with groin/genital involvement reporting they are ‘not at all’ satisfied with their sex life compared to 25% (41/161) of patients with other body areas involved (p = 0.006) (data not included in tables).

4 | DISCUSSION

Overall HRQoL among our cohort of patients with CTCL as assessed by Skindex-16 is similar compared to patients with other chronic dermatologic diseases, including eczematous dermatitis and psoriasis.¹³ Our cohort reported worse HRQoL as measured by FACT-G compared to CTCL patients from previous studies by Demierre et al.¹⁴ The inclusion of the FACT-G instrument in our survey also allows us to contrast our results with other cancer patients. Our cohort had worse HRQoL scores than long-term survivors of indolent and aggressive non-Hodgkin lymphoma.¹⁵ The mean total FACT-G score in our patients was equivalent to cancer patients with an Eastern Cooperative Oncology Group Performance Status Rating (ECOG PSR) category of 2 (‘require bed rest for <50% of waking day’).¹⁶

As a disorder that spans chronic skin disease and cancer, the optimal instrument for assessing overall HRQoL for CTCL is not clear. There is variability in the existing CTCL HRQoL literature around instruments used, with most groups using the Skindex-29,¹¹¹⁴¹⁷¹⁹ but FACT-G¹⁴ and EORTC QLQ-C30¹⁸ have also been used. We chose to use the shorter Skindex-16 given the high validity in other skin diseases,¹¹ which impacts the direct comparability of our numerical results but not trends or associations. We found similar associations and trends between the Skindex-16 and FACT-G. One important distinction is as a cancer-specific instrument, the FACT-G does not specifically assess skin symptoms such as itching. This was evident when comparing the overall HRQoL scores between patients with early and advanced disease across subscales, in particular, the symptoms subscale of the Skindex-16, for which there was a nearly twofold difference in scores (29 and 50 for early and advanced disease, respectively) compared to a smaller difference in the physical well-being subscale of the FACT-G (23 and 20 for early and advanced disease, respectively). We recommend that when HRQoL of patients with CTCL is assessed using FACT-G, additional questions around skin symptoms, particularly itch, are added. Alternatively, validation of a CTCL-specific FACT instrument could address these concerns, while maintaining the benefits of comparability with the existing data.

TABLE 2 Percent of participants responding positively (sometimes, often or very often) to Burden Score items (N = 292)

| Item                                                                 | Number (%) |
|---------------------------------------------------------------------|------------|
| I have been treated unfairly by service establishments (such as hair salons/barbers, public pools, health clubs, etc.) because of my cutaneous lymphoma. | 32/287 (11.1) |
| My cutaneous lymphoma has been mistaken for a contagious condition. | 84/286 (29.4) |
| I feel financially burdened by the cost of managing my cutaneous lymphoma. | 165/291 (57.1) |
| I feel I have to keep my cutaneous lymphoma private from others (including work or friends). | 162/289 (55.7) |
| One or more of the above                                           | 245/286 (85.7) |

*Multiple selections possible.
Patients with more advanced CTCL had worse HRQoL compared to those with early disease in this study. The association with stage was significant for both the Skindex-16 ($p < 0.001$) and FACT-G ($p = 0.001$) instruments, even when adjusted for age, gender and number of medical comorbidities (data not shown). These results are consistent with clinical experience and prior studies, suggesting patients with later-stage disease generally experience more symptoms and greater morbidity than those with early-stage disease.\cite{1,7,17,19} Demierre et al. reported that patients with more advanced CTCL reported more effects on general health, particularly in the physical, emotional and functional domains of the FACT-G.\cite{14} In our cohort, patients with advanced disease had statistically significantly worse HRQoL on all of the Skindex-16 subscales (symptoms, emotions and functioning), but only on two of the four FACT-G subscales (physical and functional well-being), suggesting that later disease stage most severely impairs patients’ overall physical health and ability to perform daily tasks, while the emotional impact is high regardless of stage.

We hypothesized that patients who were newly diagnosed with their CTCL might experience worse HRQoL, positing that patients who had more time to acclimate to their diagnosis might fare better. This did not prove to be the case, with no significant difference in HRQoL between those diagnosed $<1$ year, 1--5 years or $>5$ years. We found that the time spent treating CTCL, in particular, spending $>15$ min daily, was associated with worse HRQoL. Spending $>60$ min daily treating CTCL had a large impact on HRQoL (Tables 4 and 5). Asking patients about the amount of time spent daily treating their CTCL may provide important insight into their disease-related HRQoL.

The mean VAS itch score in our cohort was 3.2 on a 10-point scale, representing moderate pruritus.\cite{20} Similar to others,\cite{1,17} we found that higher itch scores were significantly associated with worse HRQoL on the Skindex-16 ($r_s = 0.56$; $p < 0.001$) and FACT-G ($r_s = -0.36$; $p < 0.001$) instruments. Existing literature supports that patients with chronic pruritus have lower HRQoL, and that pruritus may contribute to other symptoms (e.g., sleep disturbance, depression) which further compound the problem.\cite{21} It is important to note that our cohort had slightly lower VAS scores compared to a larger cohort of CTCL patients (mean of 4.2).\cite{22} This suggests our data might underestimate HRQoL in the general CTCL population.

Patients who reported involvement of their CTCL in the head/neck, hands/feet or groin/genitals had significantly worse HRQoL compared to those with other body parts affected (Tables 4 and 5). This association was seen globally and across all three Skindex-16 subscales ($p < 0.001$ for each), as well as the global and physical and functional well-being subscales on the FACT-G ($p < 0.001$ for each) (Tables 4 and 5). Our findings add to those of the Prospective Cutaneous Lymphoma International Prognostic Index (PROCLIPI) study, which demonstrated a worse QoL in patients with alopecia.\cite{19}

We found that nearly one-quarter (24%) of patients had involvement of their CTCL in the groin/genitals. Previous studies have reported on the impairment on sexual life reported by patients with CTCL\cite{18} and we confirm that worse HRQoL is reported by patients with
| Variable                                                                 | Total score | Symptoms subscale | Emotions subscale | Function subscale |
|--------------------------------------------------------------------------|-------------|-------------------|-------------------|------------------|
|                                                                          | β* (95% CI) | p-Value           | β* (95% CI)       | p-Value          |
| Age, per 10-year increase                                                | −2.6 (−4.8, −0.3) | 0.028            | −0.0 (−2.5, 2.5)  | 0.98             | −3.5 (−5.9, −1.0) | 0.006 |
| Advanced stage (vs. early stage)                                         | 17.5 (8.8, 26.3) | <0.001           | 16.0 (6.4, 25.5)  | 0.001            | 15.5 (5.5, 25.4)  | 0.002 |
| Body area involved (vs. other area)                                      |             |                   |                   |                  |
| Head and neck                                                           | 19.6 (13.6, 25.7) | <0.001           | 20.6 (14.0, 27.3) | <0.001           | 15.9 (9.1, 22.7)  | <0.001 |
| Hands or feet                                                           | 14.9 (8.7, 21.0) | <0.001           | 17.9 (11.2, 24.7) | <0.001           | 11.6 (4.8, 18.5)  | 0.001 |
| Groin                                                                   | 16.7 (9.7, 23.8) | <0.001           | 21.7 (14.0, 29.3) | <0.001           | 12.4 (4.5, 20.2)  | 0.002 |
| Itching severity, per 1-point increase                                   | 5.5 (4.6, 6.4)  | <0.001           | 7.9 (7.1, 8.7)    | <0.001           | 4.4 (3.3, 5.5)    | <0.001 |
| Time since diagnosis <1 year diagnosis                                   | 0.21 | 0.19             | 0.31             | 0.22             |
| 1–5 years                                                               | −2.2 (−10.5, 6.1) | <0.001           | 0.9 (−8.1, 9.9)   | <0.001           | −4.8 (−13.8, 4.3) | −2.1 (−11.9, 7.6) |
| >5 years                                                                | −4.4 (−12.9, 4.2) | <0.001           | −2.8 (−12.2, 6.5) | <0.001           | −5.8 (−15.2, 3.5) | −4.5 (−14.7, 5.6) |
| Help from caregiver <1 year diagnosis                                   | 7.6 (1.4, 13.8) | 0.016            | 4.9 (−1.9, 11.7)  | 0.16             | 6.5 (−0.3, 13.3)  | 0.06 |
| Time spent treating CTCL by respondent <15 min per day                  | <0.001       | <0.001           | <0.001           | <0.001           |
| 16–60 min per day                                                       | 23.3 (16.7, 29.8) | <0.001           | 22.0 (14.6, 29.3) | <0.001           | 24.9 (17.6, 32.2) | 22.3 (14.4, 30.2) |
| >60 min per day                                                         | 25.9 (18.8, 33.1) | <0.001           | 24.7 (16.6, 32.8) | <0.001           | 23.5 (15.6, 31.5) | 30.6 (21.9, 39.3) |
| Burden of CTCLb                                                          |             |                   |                   |                  |
| Treated unfairly because of CTCL                                         | 26.7 (17.3, 36.2) | <0.001           | 15.2 (4.5, 25.9)  | 0.006            | 28.5 (18.2, 38.9) | <0.001 |
| CTCL has been mistaken for a contagious condition                        | 21.8 (15.3, 28.2) | <0.001           | 18.5 (11.2, 25.8) | <0.001           | 18.9 (11.7, 26.2) | <0.001 |
| CTCL has to be kept private from others                                  | 15.4 (9.3, 21.5) | <0.001           | 5.9 (−1.0, 12.8)  | 0.091            | 17.6 (11.0, 24.3) | <0.001 |
| Financially burdened by cost of managing CTCL                           | 19.4 (13.5, 25.3) | <0.001           | 16.5 (9.8, 23.1)  | <0.001           | 19.3 (12.8, 25.9) | <0.001 |
| Any of the above                                                         | 20.5 (13.1, 28.0) | <0.001           | 14.6 (6.2, 22.9)  | 0.001            | 20.9 (12.7, 29.2) | <0.001 |

Abbreviation: CTCL, cutaneous T-cell lymphoma.

*Regression coefficient, corresponding to the mean change in quality of life score per change in the associated variable.

bDichotomized as sometimes, often or very often versus rarely or never (reference); see Table 2 for the text of the original question.
| Variable | Total score | PWB subscale | SWB subscale | EWB subscale | FWB subscale |
|----------|-------------|--------------|--------------|--------------|--------------|
|          | $\beta$ (95% CI) | $p$-Value  | $\beta$ (95% CI) | $p$-Value  | $\beta$ (95% CI) | $p$-Value  | $\beta$ (95% CI) | $p$-Value  |
| Age, per 10-year increase | 1.9 (0.3, 3.6) | 0.022 | 0.5 (−0.0, 1.1) | 0.057 | 0.4 (−0.2, 1.0) | 0.17 | 0.7 (0.3, 1.2) | 0.002 | 0.2 (−0.3, 0.7) | 0.41 |
| Advanced stage (vs. early stage) | −11.1 (−17.6, −4.5) | <0.001 | −4.0 (−6.1, −1.9) | <0.001 | −0.3 (−2.7, 2.2) | 0.84 | −1.6 (−3.5, 0.3) | 0.11 | −5.3 (−7.3, −3.3) | <0.001 |
| Body area involved (vs. other area) | | | | | | | | | |
| Head and neck | −9.8 (−14.4, −5.2) | <0.001 | −4.5 (−5.9, −3.0) | <0.001 | −0.1 (−1.8, 1.5) | 0.87 | −2.3 (−3.6, −1.0) | 0.001 | −3.0 (−4.4, −1.5) | <0.001 |
| Hands or feet | −9.2 (−13.7, −4.6) | <0.001 | −3.9 (−5.3, −2.4) | <0.001 | −0.6 (−2.3, 1.0) | 0.46 | −1.3 (−2.6, 0.0) | 0.056 | −3.7 (−5.1, −2.3) | <0.001 |
| Groin | −9.6 (−14.9, −4.4) | <0.001 | −3.6 (−5.3, −1.9) | <0.001 | −1.0 (−2.9, 0.9) | 0.3 | −1.5 (−3.0, 0.0) | 0.052 | −3.1 (−4.8, −1.5) | <0.001 |
| Itching severity, per 1-point increase | −2.5 (−3.2, −1.7) | <0.001 | −1.1 (−1.4, −0.9) | <0.001 | −0.1 (−0.4, 0.2) | 0.4 | −0.4 (−0.7, −0.2) | <0.001 | −0.8 (−1.0, −0.5) | <0.001 |
| Time since diagnosis | | | | | | | | | |
| <1 year | (ref) | | (ref) | | (ref) | | (ref) | | (ref) | | | |
| 1–5 years | 0.1 (−5.9, 6.1) | | 0.6 (−1.3, 2.6) | | −0.8 (−2.9, 1.4) | | 1.1 (−0.6, 2.8) | | −0.6 (−2.5, 1.3) | | |
| >5 years | 1.7 (−4.5, 7.9) | | 1.3 (−0.7, 3.4) | | −1.4 (−3.6, 0.8) | | 1.3 (−0.4, 3.1) | | 0.7 (−1.2, 2.7) | | |
| Help from caregiver (vs. no help) | −3.8 (−8.3, 0.7) | 0.099 | −2.3 (−3.8, −0.9) | 0.002 | 3.0 (1.4, 4.5) | 0.001 | −2.0 (−3.3, −0.8) | 0.002 | −2.4 (−3.8, −1.0) | 0.001 |
| Time spent treating CTCL by respondent | | | | | | | | | |
| <15 min per day | (ref) | | (ref) | | (ref) | | (ref) | | (ref) | | | |
| 16–60 min per day | −10.5 (−15.5, −5.5) | <0.001 | −4.2 (−5.8, −2.7) | <0.001 | −0.6 (−2.5, 1.2) | 0.64 | −2.7 (−4.1, −1.2) | 0.001 | −3.2 (−4.8, −1.6) | <0.001 |
| >60 min per day | −15.0 (−20.5, −9.4) | <0.001 | −6.5 (−8.2, −4.7) | <0.001 | −0.8 (−2.9, 1.2) | 0.001 | −2.8 (−4.4, −1.2) | 0.001 | −5.0 (−6.8, −3.3) | <0.001 |
| Burden of CTCL<sup>a</sup> | | | | | | | | | |
| Treated unfairly because of CTCL | −16.0 (−22.8, −9.2) | <0.001 | −5.1 (−7.4, −2.8) | <0.001 | −3.0 (−5.5, −0.4) | 0.022 | −4.6 (−6.5, −2.6) | <0.001 | −3.5 (−5.7, −1.2) | 0.002 |
| CTCL has been mistaken for a contagious condition | −12.5 (−17.2, −7.7) | <0.001 | −4.8 (−6.4, −3.3) | <0.001 | −2.4 (−4.2, −0.7) | 0.007 | −2.5 (−3.9, −1.1) | <0.001 | −3.0 (−4.5, −1.5) | <0.001 |
| CTCL has to be kept private from others | −11.5 (−15.9, −7.1) | <0.001 | −2.0 (−3.4, −0.6) | <0.001 | −4.3 (−5.9, −2.7) | <0.001 | −2.5 (−3.8, −1.2) | <0.001 | −2.6 (−4.0, −1.2) | <0.001 |
Table 5 (Continued)

| Variable                                                                 | Score (95% CI)       | P-  | Value |
|--------------------------------------------------------------------------|----------------------|-----|-------|
| Financial burdened by cost of managing CTCL                            | -13.7 (-18.0, -9.4)  | 0.001 <0.001 | 
| Emotionally well-being: EWB                                           | -3.1 (-5.9, -2.4)    | 0.001 <0.001 | 
| Physical well-being: PWB                                               | -15.8 (-21.3, -10.4) | 0.001 <0.001 |
| Any of the above                                                        | -1.3 (-2.7, 0.5)     | <0.001 | <0.001 |

---

**Abbreviations:** CTCL, cutaneous T-cell lymphoma; EWB, emotional well-being; PWB, physical well-being; SWB, social/family well-being.

**Regression coefficient:** corresponding to the mean change in quality of life score per change in the associated variable.

**Dichotomized as sometimes, often or very often versus rarely or never (reference):** see Table 2 for the text of the original question.

---

This finding of worse HRQoL with groin/genital involvement is not surprising when put in the context of the impact on HRQoL of other skin conditions that impact the groin/genitals. Groin/genital involvement in patients with hidradenitis suppurativa (HS) is associated with decreased HRQoL generally, and patients with HS report lower sexual health and sexual function. Our findings reinforce the importance of asking patients about and evaluating for the involvement of CTCL in the groin/genitals, as focusing on the treatment of these areas could significantly impact patient’s sexual health and overall HRQoL.

Based on the findings of Demierre’s group, we were inspired to further evaluate the themes from the independent measures in that study along with one additional measure (Table 2). The Burden Score questions address possible stigma or shame that patients with CTCL might experience (such as needing to keep the condition private and being treated unfairly because of CTCL). Collectively, the Burden Score was significantly associated with overall HRQoL by both instruments used, with an impact on par with the stage of disease (Tables 4 and 5). This suggests that patients with CTCL may experience significant emotional distress from shame and stigma associated with their disease which, when added to the impact of physical symptoms such as itching and poor sexual function, contribute to worse overall quality of life, and studies to further validate the Burden Score are warranted.

This study is one of the largest describing HRQoL in CTCL, though there are factors which might limit the generalizability of our findings. Given the rarity of CTCL, this survey was distributed electronically via disease-specific social media groups and email listservs with overlapping membership, making calculation of a response rate not feasible. Our sample was of a similar age (mean 57 years) to the average age of CTCL patients; however, our patient group had more who identified as white and female than the overall population of patients with CTCL (though in similar proportions to that of Demierre et al.). There are known racial disparities in the age of presentation and outcomes of non-white patients with CTCL, given the low overall number of non-white respondents in our group we could not assess racial disparities in HRQoL. Our sample also contains fewer patients with CD30 LPDs compared to the known frequency of these disorders, possibly because this group of patients may not be as active in support groups. Importantly, the data in this study are patient-reported, and subject to bias both at the level of self-selection and self-reporting. Lastly, we did not ask about specific treatments for CTCL and cannot comment on the relationship of particular treatments to HRQoL.
5 | CONCLUSIONS

Individuals with CTCL continue to be profoundly impacted by their disease. As a condition that has components of cancer and chronic skin disorder, patients with CTCL experience intense physical and psychosocial suffering across multiple domains which encompass negative social interactions, contributions by stigma and shame, and impacts on physical functioning including patients’ sexual lives. Future research must focus on developing evidence-based interventions that address these critical domains of everyday life to improve the quality of life for CTCL patients across their disease trajectory.

ACKNOWLEDGEMENTS

The authors thank the Cutaneous Lymphoma Foundation, Susan Thornton, Judy Jones, and the patients and patient caregivers who helped review the questionnaire and participated in this study.

Michi M. Shinohara is supported by the Michael Piekorn Endowed Chair in Dermatology Research. Daniel S. Hippe and Kristina Lachance are supported by the Merkel Cell Carcinoma Gift Fund.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

M.M. Shinohara https://orcid.org/0000-0003-1388-5330

D.S. Hippe https://orcid.org/0000-0003-2427-4404

REFERENCES

1. Wright A, Wijeratne A, Hung T, Gao W, Whittaker S, Morris S, et al. Prevalence and severity of pruritus and quality of life in patients with cutaneous T-cell lymphoma. J Pain Symptom Manag. 2013;45 (1):114–9.
2. Hong J, Koo B, Koo J. The psychosocial and occupational impact of chronic skin disease. Dermatol Ther. 2008;21 (1):54–9.
3. Choi J, Koo JY. Quality of life issues in psoriasis. J Am Acad Dermatol. 2003;49 (2 Suppl):S57–61.
4. Annunziata MA, Muzzati B, Flaiban C, Gipponi K, Carnagli C, Tralongo P, et al. Long-term quality of life profile in oncology: a comparison between cancer survivors and the general population. Support Care Canc. 2018;26 (2):651–6.
5. Jensen RE, Arora NK, Bellizzi KM, Rowland JH, Hamilton AS, Aziz NM, et al. Health-related quality of life among survivors of aggressive non-Hodgkin lymphoma. Cancer. 2013;119 (3):672–80.
6. Mols F, Aaronson NK, Vingerhoets AJJM, Coebergh JWV, Vreugdenhil G, Lybeert MLM, et al. Quality of life among long-term non-Hodgkin lymphoma survivors. Cancer. 2007;109 (8):1659–67.
7. Demierre M-F, Gan S, Jones J, Miller DR. Significant impact of cutaneous T-cell lymphoma on patients’ quality of life. Cancer. 2006;107 (10):2504–11.
8. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inf. 2009;42 (2):377–81.
9. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O’Neal L, et al. The REDCap Consortium: building an international community of software platform partners. J Biomed Inf. 2019;95:103208.
10. Chauhry S, Jin L, Meltzer D. Use of a self-report-generated Charlson Comorbidity Index for predicting mortality. Med Care. 2005;43 (6):607–17.
11. Chren M-M, Lasek RJ, Sahay AP, Sands LP. Measurement properties of Skindex-16: a brief quality-of-life measure for patients with skin diseases. J Cutan Med Surg. 2001;5 (2):105–10.
12. Cella DF, Tulsky DS, Gray G, Sarabian B, Linn E, Bonomi A, et al. The functional assessment of cancer therapy scale: development and validation of the general measure. J Clin Oncol. 1993;11 (3):570–9.
13. Chren M-M. The Skindex instruments to measure the effects of skin disease on quality of life. Dermatol Clin. 2012;30 (2):231–6.xiii.
14. Demierre M-F, Tien A, Miller D. Health-related quality-of-life assessment in patients with cutaneous T-cell lymphoma. Arch Dermatol. 2005;141 (3):325–30.
15. Beaven AW, Samsa G, Zimmerman S, Smith SK. Quality of life is similar between long-term survivors of indolent and aggressive non-Hodgkin lymphoma. Cancer Invest. 2016;34 (6):279–85.
16. Pearman T, Yanez B, Peipert J, Wortman K, Beaumont J, Cella D. Ambulatory cancer and US general population reference values and cutoff scores for the functional assessment of cancer therapy. Cancer. 2014;120 (18):2902–9.
17. Herbosa CM, Semenov YR, Rosenberg AR, Mehta-Shah N, Musiek AC. Clinical severity measures and quality-of-life burden in patients with mycosis fungoides and Sézary syndrome: comparison of generic and dermatology-specific instruments. J Eur Acad Dermatol Venereol. 2020;34 (5):995–1003.
18. Sampogna F, Frontani M, Baliva G, Lombardo GA, Alvetreti G, Di Pietro C, et al. Quality of life and psychological distress in patients with cutaneous lymphoma. Br J Dermatol. 2009;160 (4):815–22.
19. Molloy K, Jonak C, Woei-A-Jin FJS, Guenova E, Busschots AM, Bervoets A, et al. Characteristics associated with significantly worse quality of life in mycosis fungoides/Sézary syndrome from the Prospective Cutaneous Lymphoma International Prognostic Index (PROCLIP) study. Br J Dermatol. 2020;182 (3):770–79.
20. Reich A, Chatzigikourides C, Zeidler C, Osaka N, Furue M, Takamori K, et al. Tailoring the cut-off values of the Visual Analogue Scale and Numeric Rating Scale in itch assessment. Acta Derm Venerol. 2017;97 (6):759–60.
21. Erturk IE, Arican O, Omurlu IK, Sut N. Effect of the pruritus on the quality of life: a preliminary study. Ann Dermatol. 2012;24 (4):406–12.
22. Vij A, Ducic M. Prevalence and severity of pruritus in cutaneous T cell lymphoma. Int J Dermatol. 2012;51 (8):930–4.
23. Jørgensen AR, Holm JG, Ghazanfar MN, Yao Y, Ring HC, Thomsen SF, et al. Factors affecting quality of life in patients with hidradenitis suppurativa. Arch Dermatol Res. 2019.
24. Vanse IC, Deckers IE, van der Maten AD, Evers AWM, Boer J, van der Zee HH, et al. Sexual health and quality of life are impaired in hidradenitis suppurativa: a multicentre cross-sectional study. Br J Dermatol. 2017;176 (4):1042–7.
25. Willemze R, Jaffe ES, Burg G, Cerroni L, Berti E, Swerdlow SH, et al. WHO-EORTC classification for cutaneous lymphomas. Blood. 2005;105 (10):3768–85.

26. Korgavkar K, Xiong M, Weinstock M. Changing incidence trends of cutaneous T-cell lymphoma. JAMA Dermatol. 2013;149 (11):1295–9.

27. Nath SK, Yu JB, Wilson LD. Poorer prognosis of African-American patients with mycosis fungoides: an analysis of the SEER dataset, 1988 to 2008. Clin Lymphoma, Myeloma & Leukemia. 2014;14 (5):419–23.

28. Sun G, Berthelot C, Li Y, Glass DA, George D, Pandya A, et al. Poor prognosis in non-Caucasian patients with early-onset mycosis fungoides. J Am Acad Dermatol. 2009;60 (2):231–5.

29. Wilson LD, Hinds GA, Yu JB. Age, race, sex, stage, and incidence of cutaneous lymphoma. Clin Lymphoma Myeloma Leuk. 2012;12 (5):291–6.

How to cite this article: Shinohara MM, Mahurin HM, Tarabadkar E, et al. Health-related quality of life in cutaneous T-cell lymphoma: A cross-sectional survey study. Skin Health Dis. 2021;e45. https://doi.org/10.1002/ski2.45