J Wound Ostomy Continence Nurs. 2017;44(1):29-33.
Published by Lippincott Williams & Wilkins

CE
1.0
ANCC
Contact
Hours

Incidence of Skin Tears and Risk Factors

A Systematic Literature Review

Kelly Cristina Strazzieri-Pulido ◆ Giovana Ribau Picolo Peres ◆ Ticiane Carolina Gonçalves Faustino Campanili ◆ Vera Lúcia Conceição de Gouveia Santos

ABSTRACT

Skin tears are traumatic wounds resulting from friction and shearing forces. Clinical practice strongly indicates that skin tears are a prevalent problem but their incidence is not well established in the literature. This systematic literature review identified and evaluated the available literature on the incidence and risk factors for skin tears in adults and the elderly. Inclusion criteria were epidemiological studies published in English, Spanish, or Portuguese languages from January 1990 through June 2014 and available in full text. Study quality was assessed using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement and the Guidelines for Critically Appraising Studies of Prevalence or Incidence of a Health Problem. Five studies reporting incidence of skin tears met the selection criteria. Reported incidence rates of skin tears ranged from 2.23% to 92% in long-term care facilities and varied from 2.1% among men to 4.6% among women living in the community. The most prevalent risk factor for skin tears was old age, followed by impaired mobility, falls and accidental injuries, previous skin tears, cognitive deficit/dementia, dependence in transfers, and upper limbs. Further epidemiological studies on skin tears are necessary to elucidate the cause of these injuries and identify the profile of people at risk for skin tears, contributing to the development and implementation of appropriate preventive interventions.

KEY WORDS: Skin aging, Skin tears, Epidemiology, Incidence Risk factors.

INTRODUCTION

Skin tears are traumatic wounds occurring on the extremities; they are caused by friction and shearing forces that separate the dermis from the epidermis (resulting in a partial-thickness wound) or both the dermis and epidermis from underlying structures (resulting in a full-thickness wound).[1-4] Skin tears are particularly prevalent among frail, malnourished, and functionally dependent elderly persons.[1,2,5-17]

Skin tears have been reported to be more prevalent than pressure injuries and burns.[2,18-21] However, research concerning the prevalence, incidence, or economic impact of skin tears is sparse.[13,20,22] Despite the paucity of research in this area, clinical practice strongly suggests that skin tears are a clinically relevant and prevalent occurrence, especially among older patients and individuals with chronic or critically illness.[8,23]

The aim of this systematic review was to identify and evaluate research on the incidence and risk factors associated with skin tears in adults and elderly persons.

METHODS

We followed methods recommended by the Cochrane Collaboration for this systematic review.[24] Our search was guided by the following question, "What information is available in the literature on the incidence and factors associated with skin tears in adults and the elderly?" To answer this question, the Cochrane, CINAHL, EBM Reviews, EMBASE, LILACS, PubMed, Scopus, and Web of Science electronic databases were searched for articles published from January 1990 through June 2014.

Inclusion criteria were epidemiological studies investigating the incidence of skin tears, published in English, Spanish, or Portuguese languages. Only studies available in full text were included. Book chapters, summary of events, integrative or comprehensive review articles, case reports, consensus, editorials, guides, correspondences, clinical trials, case-control, and cohort studies were excluded.

Because the terminology used to describe skin tears is not standardized, the search strategy was based not only on the standardized medical vocabulary, the Medical Subject Headings (MeSH)[25] and the Descriptors in Health Sciences (DeCS),[26] which are indicated in bold in Table 1, but also on key words used in narrative reviews and update articles. Articles were located using the Boolean functions AND and OR, according to the database searched. The search strategy is summarized in Table 1. Search results (ie, article title, authors' name, journal title, year of publication, volume, issue and page numbers, section, abstract,

Kelly Cristina Strazzieri-Pulido, PhD, ETN, *Graduate Program in Adult Health Nursing, University of São Paulo School of Nursing (PROESA-EEUSP), Sao Paulo, SP, Brazil.*

Giovana Ribau Picolo Peres, MSN, ETN, *São Camilo Hospital, Sao Paulo, SP, Brazil.*

Ticiane Carolina Gonçalves Faustino Campanili, MSN, ETN, *University of São Paulo School of Medicine (FMUSP), Sao Paulo, SP, Brazil.*

Vera Lúcia Conceição de Gouveia Santos, PhD, CETN (TiSOBEST), *Medical-Surgical Nursing Department, University of São Paulo School of Nursing (EE-USP), Sao Paulo, SP, Brazil.*

The authors declare no conflicts of interest.

Correspondence: *Giovana Ribau Picolo Peres, MSN, ETN, São Camilo Hospital, Av. Dom Pedro I, 219 apt. 1006, CEP 01552-001 Sao Paulo, SP, Brazil (gipicoloenf@yahoo.com.br).*

DOI: 10.1097/WON.0000000000000288

TABLE 1.
Search Strategy[a]

#	MeSH, DeCS, or Key Word
1	**Older people**
2	**Adult**
3	**Child**
4	**Skin aging** OR Elderly skin
5	**Incidence** OR **Epidemiology**
6	**Lacerations** OR Mangled wounds OR Tear wounds OR Rag wounds OR Skin lacerations OR Traumatic laceration OR Pretibial laceration OR Skin tears OR Skin trauma OR Skin stripping
7	**(#1 OR #2 OR #3 OR #4) AND (#5) AND (#6)**

Abbreviations: DeCS, Descriptors in Health Sciences; MeSH, Medical Subject Headings.
[a]MeSH and DeCS terms are shown in bold letters.

and key words) were exported to the EndNote Web software for Word 2011 (Thomson Reuters, New York).[27]

Initially, articles were screened for relevance by title and abstract. The documents were randomly distributed among the authors of this systematic review; every abstract was independently checked by 2 authors. If there was doubt about the relevance of an article, the abstract was evaluated by a third author. When an abstract was found to meet inclusion criteria, we retrieved the full article. Retrieved articles were then randomly distributed among the authors, and each article was independently evaluated by 2 authors. A third reviewer served as a referee in the validation of the selection process by reevaluating a random sample of 30% of the articles.

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)[28] and the Guidelines for Critically Appraising Studies of Prevalence or Incidence of a Health Problem (Loney Guidelines)[29] were used to assess study quality. The Brazilian-Portuguese version of STROBE[28] contains 22 items, with recommendations on what should be included in an accurate and complete description of observational studies. Every item was rated 0 or 1. The total score was converted into percent values to better assess the quality of the articles. Articles were considered of good quality if the total score was 80% or more.

The Loney Guidelines developed by Loney and collaborators[29] assess adequacy and accuracy of a study related to validity of methods and interpretation and applicability of results. The instrument comprises 8 items, as follows: random sample or whole population; criteria for sample selection; adequate of sample size; standardized measures/instruments; impartiality (inter and intra-rater reliability); adequate response rate and description of refusers; confidence intervals and subgroup analysis; and description of study subjects. Items present in a study are assigned a score of 1 for a maximum score of 8. There are no quality categories or cutoff score for the Loney Guidelines. We deemed articles with a total score of 7 or more of good quality.

TABLE 2.
Number of Articles per Database

	Identified Articles	
Database	**n**	**%**
CINAHL	17	0.21
Cochrane	68	0.84
EBM Reviews	07	0.09
EMBASE	4644	57.42
LILACS 1	1	0.01
PubMed	2788	34.48
Scopus	283	3.50
Web of Science	279	3.45
Total	8087	100

RESULTS

The initial search identified 8087 documents from the 8 electronic databases identified previously; 2426 duplicate documents were removed, yielding 5661 documents with unique titles. After reading the titles, 5425 documents were excluded and 236 abstracts were reviewed to eliminate book chapters, conference abstracts, review articles, case reports, consensus statements, editorials, guidelines, letters, clinical trials, cross-sectional studies, and case-control studies. Five articles on the incidence of skin tears met selection criteria and were read in full.[1,8-10,30]

Most documents were identified via EMBASE (n = 4644; 57.4%) and PubMed (n = 2788; 34.5%). Articles were also identified through the Cochrane Database (n = 68; 0.84%), CINAHL (n = 17; 0.21%), EBM Reviews (n = 7; 0.09%), and LILACS (n = 1; 0.01%) (Table 2). Table 3 summarizes data from the 5 studies incorporated into this systematic review. This summary includes the authors' name, year of publication, country where the study was conducted, methods, results, and quality scores based on STROBE and the Loney Guidelines.

Three studies were conducted in the United States,[1,9,10] 1 was conducted in Australia,[8] and 1 in New Zealand.[30] Three studies were conducted in long-term care facilities (LTCFs),[1,9,10] 1 was conducted in an acute care facility,[8] and 1 in a community setting.[30] Physical examination was the main strategy for data collection and performed in all 5 studies.[1,8-10,30] The Payne-Martin Classification System for Skin Tears was administered in 3 studies,[1,10,30] 1 study[9] used its own classification system, and 1 study report[8] did not identify the instrument used to classify skin tears.

The incidence of skin tears ranged from 2.23% among 896 residents from 10 LTCFs[1] to 92% among 349 residents of an LTCF.[9] A 2-year epidemiological study with older adults living in the community found an overall incidence of skin tears of 2.1% and 4.6% among men and women, respectively, and incidence rates of 1.1% and 6.1%, respectively, for those aged

TABLE 3.
Summary of the 5 Selected Articles on Skin Tear Epidemiology

Publication Author (Year)	Country	Methods	Incidence	Skin Tear–Associated Factors	STROBE	Loney Guidelines
Payne and Martin (1990)[1]	USA	Cohort study in 10 LTCFs N = 896 beds Study period = 5 mo Physical examination Instrument: Payne-Martin Classification System for Skin Tears Descriptive data analysis	2.23%	Advanced age, history of skin tears, presence of senile purpura, cognitive deficit, being bedridden, impaired mobility, dependence in transfers and changing positions, to feed themselves/use of a feeding tube Linear-type skin tears: reduced dermal thickness	44%	5
Malone and collaborators (1991)[10]	USA	Retrospective cohort study in an LTCF N = 349 residents Study period = 1 y Physical examination Own instrument Chi-square test and a *t* test	92%	Advanced age, female gender, upper limbs, dependence in transfers, falls, accidental injuries, and wheelchair	81%	8
Everett and Powell (1994)[8]	Australia	Cohort study in a backup hospital N = 347 beds Study period = 6 mo Physical examination Instrument: Not reported or described Descriptive data analysis	Not reported	Chairs and beds, falls and accidental injuries, fragile skin, lack of balance, upper and lower limbs	53%	4.5
McGough-Csarny and Kopac (1998)[10]	USA	Cohort study in 10 LTCFs Number of beds/residents not reported Study period = 6 mo Physical examination Instrument: Payne-Martin Classification System for Skin Tears Descriptive data analysis and correlation analysis	Not reported	Advanced age, frail elderly, female gender, dependence in activities of daily living, malnutrition, dementia, spasticity and stiffness, sensory loss, impaired mobility, poor appetite, polypharmacy, use of assistive devices, ecchymosis, history of skin tears	62.5%	6.5
Kennedy and Kerse (2011)[30]	New Zealand	Cohort study in the community N = 2401 outpatients from a rural primary health care facility Study period = 2 y Pretibial skin tears Physical examination Instrument: Payne-Martin Classification System for Skin Tears Descriptive data analysis and univariate and multiple logistic regression analyses Incidence per 5-y age group	Overall incidence: men, 2.1% women, 4.6% Age group: 70-74 y: men, 1.1%; women, 6.1% ≥85 y: men, 4%; women, 30%	Advanced age, summer season, accidental injuries, fall of objects	72%	7.5

Abbreviations: Loney Guidelines, Guidelines for Critically Appraising Studies of Prevalence or Incidence of a Health Problem; LTCF, long-term care facility; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology.

70 to 74 years, increasing to 4% and 30%, respectively, for those aged 85 years or older.[30] Two articles[8,10] did not report on the incidence of skin tears, although it was initially stated as an objective of those studies.

The most frequently reported risk factors for skin tears were advanced age (n = 4),[1,9,10,30] impaired mobility (n = 3),[1,8,10] falls and accidental injuries (n = 3),[8,9,30] history of skin tears (n = 2),[1,10] cognitive impairment/dementia (n = 2),[1,10] dependence in transfers (n = 2),[1,9] and upper limbs (n = 2).[8,9] Other risk factors mentioned in the 5 studies were presence of senile purpura, being bedridden, unable to change positions, unable to feed themselves/use of a feeding tube, reduced dermal thickness,[1] wheelchairs,[9] chairs and beds, fragile skin, lack of balance, lower limbs,[8] frail elderly, dependence in activities of daily living, malnutrition, spasticity and stiffness, sensory loss, poor appetite, polypharmacy, use of an assistive device (orthosis), presence of ecchymosis,[10] and summer season.[30]

The articles by Malone and collaborators[9] and Kennedy and Kerse[30] were considered of good quality, whereas the articles by Payne and Martin[1] and Everett and Powell[8] showed the lowest study quality, failing to report confidence intervals for incidence estimates and to describe the study sample.

DISCUSSION

The incidence of skin tears reported in these studies ranged from 1.1% to 92% in different facilities, varying according to gender and age group. The highest incidence was found in a retrospective study conducted in the United States, in which 321 skin tears were detected in 349 patients over 1 year, resulting in an incidence rate of 92% (ie, 0.92 skin tears per patient per year).[9] However, the authors suggested that this incidence rate could be up to 3 times higher than that found because the records for this type of wound usually are not accurate.[9]

The lowest incidence of skin tears (2.1% for men and 4.6% for women) was reported by Kennedy and Kerse,[30] who estimated the incidence of pretibial skin tears in patients aged 65 years or older from a rural primary health care facility in New Zealand over 2 years.

Payne and Martin[1] conducted a 5-month study in 10 LTCFs in the United States, totaling 896 beds. Skin tears were detected in 20 patients, corresponding to a 2.23% incidence rate for the study period. The 20 patients had a total of 50 skin tears, averaging 2.5 skin tears per patient.

Kennedy and Kerse[30] found that the mean age of patients with skin tears was 80 years. The incidence of skin tears was lower in the winter (11%) compared to summer (44%); this finding may be associated with wearing clothing that increase exposure of the extremities during the warmer summer season.[30] Most of the skin tears were caused by objects that fell on the legs or were out of sight; falls were the least frequent cause.[30] McGough-Csarny and Kopac[10] conducted a 6-month study in a nursing home for war veterans and found 154 skin tears among the 154 residents during the study period, corresponding to an incidence of 1 skin tear per resident. Most of residents (79.2%) had a history of skin tears.[10]

Advanced age was the risk factor most frequently associated with skin tears in the reviewed studies and specialized literature.[1,2,9,31-33] Nevertheless, clinical experience strongly suggests that skin tears are not restricted to the extremes of age.[2,32,34-36] Although the elderly and infants are the highest-risk groups for skin tears, there are other groups subject to the weakening of the skin who should not be ignored. These groups included critically ill patients (persons receiving care in an intensive care unit or those who have suffered major trauma or surgery), patients near the end of life, and persons with intrinsic and extrinsic risk factors for skin tears, regardless of age.[32,34-36]

This systematic review found considerable variability in the incidence of skin tears among the few evidence-based studies found in the literature and lack of more recent incidence studies on this topic. Further epidemiological studies on skin tears are needed to increase our knowledge of the incidence of skin tears and modifiable and constitutional risk factors associated with these wounds. Understanding how and why skin tears occur is essential for the identification of at-risk patients and development of prevention strategies.[37]

CONCLUSION

The incidence of skin tears ranged from 1.1% in community-dwelling men to 92% in different settings in an LTCF. Skin tears were associated with advanced age, impaired/limited mobility, falls and accidental injuries, female gender, history of skin tears, cognitive impairment/dementia, dependence in transfers, and upper limbs.

KEY POINTS

- The incidence of skin tears ranged from 2% to 92% in different settings, varying according to gender and age group.
- Incidence rates of 1.1% for men and 4.6% for women were found in the community.
- Advanced age was the risk factor more frequently identified in the reviewed studies.

REFERENCES

1. Payne RL, Martin ML. The epidemiology and management of skin tears in older adults. *Ostomy Wound Manage*. 1990;26:26-37.
2. Carville K, Lewin G, Newall N, et al. STAR: a consensus for skin tear classification. *Prim Intent*. 2007;15:18-28.
3. Strazzieri-Pulido KC. *Adaptação cultural e validação do instrumento STAR Skin Tear Classification System, para a língua portuguesa no Brasil* [*Cultural adaptation and validation of the STAR Skin Tear Classification System into Brazilian Portuguese*] [master's thesis]. Sao Paulo, SP, Brazil: School of Nursing, Universidade de São Paulo; 2010.
4. Strazzieri-Pulido KC, Santos VLCG. Cultural adaptation and validation of STAR Skin Tear Classification System for Brazilians. *J Wound Ostomy Continence Nurs*. 2011;38:S92.
5. Bank D, Nix D. Preventing skin tears in a nursing and rehabilitation center: an interdisciplinary effort. *Ostomy Wound Manage*. 2006;52:38-46.
6. Baranoski S. Skin tears: the enemy of frail skin. *Adv Skin Wound Care*. 2000;13:123-126.
7. Patient Safety Advisory. Skin tears: the clinical challenge. *Pa Patient Advis Authority*. 2006;3:5-10.
8. Everett S, Powell T. Skin tears: the underestimated wound. *Prim Intent*. 1994;2:28-30.
9. Malone ML, Rozario N, Gavinski M, Goodwin J. The epidemiology of skin tears in the institutionalized elderly. *J Am Geriatr Soc*. 1991;39:591-595.
10. McGough-Csarny J, Kopac CA. Skin tears in institutionalized elderly: an epidemiological study. *Ostomy Wound Manage*. 1998;44:14S-25S.
11. Meuleneire F. Using a soft silicone-coated net dressing to manage skin tears. *J Wound Care*. 2002;11:365-369.
12. Meuleneire F. The management of skin tears. *Nurs Times*. 2003;99:69-71.
13. O'Regan A. Skin tears: a review of the literature. *World Council Enterostomal Ther J*. 2002;22:26-31.
14. Payne RL, Martin ML. Defining and classifying skin tears: need for a common language. *Ostomy Wound Manage*. 1993;39:16-26.
15. Ratliff CR, Fletcher KR. Skin tears: a review of the evidence to support prevention and treatment. *Ostomy Wound Manage*. 2007;53:32-40.
16. Selden ST, Cowell B, Fenno J. Skin tears: recognizing and treating this growing problem. *Skin Aging*. 2002;10:55-60.
17. Thomas DR, Goode PS, LaMaster K, Tennyson T, Parnell LK. A comparison of an opaque foam dressing versus a transparent film dressing in the management of skin tears in institutionalized subjects. *Ostomy Wound Manage*. 1999;45:22-28.
18. Carville K, Smith J. Report on the effectiveness of comprehensive wound assessment and documentation in the community. *Prim Intent*. 2004;12:41-48.
19. Edwards H, Gaskill D, Nash R. Treating skin tears in nursing home residents: a pilot study comparing four types of dressings. *Int J Nurs Pract*. 1998;4:25-32.
20. Morey P. Skin tears: a literature review. *Prim Intent*. 2007;15:122-129.
21. Morey P, Young J, Nikoletti S. The prevalence of skin tears within a Western Australian acute care setting. Paper presented at: AWMA 2004. 5th National Conference: Celebrating 10 Years, Reflection and Evolution; 2004; Hobart, Tasmania, Australia.
22. LeBlanc K, Baranoski S. Skin tears: state of the science: consensus statements for the prevention, prediction, assessment, and treatment of skin tears. *Adv Skin Wound Care*. 2011;24:2-15.
23. White W. Skin tears: a descriptive study of the opinions, clinical practice and knowledge base of RNs caring for the aged in high care residential facilities. *Prim Intent*. 2001;9:138-149.

24. Higgins JPT, Green S. *Cochrane Handbook for Systematic Reviews of Interventions*. Version 5.1.0. London, England: The Cochrane Collaboration; 2011. http://www.cochrane-handbook.org. Accessed July 22, 2012.
25. MeSH (Medical Subject Headings). NLM controlled vocabulary thesaurus used for indexing articles for PubMed. http://www.ncbi.nlm.nih.gov/mesh. Accessed: July 22, 2012.
26. DeCS (Descritores em Ciências da Saúde). Controlled vocabulary thesaurus in three languages created by BIREME. http://decs.bvs.br/P/decsweb2012.htm. Accessed July 22, 2012.
27. *EndNote Web* [Reference manager software]. New York, NY: Thomson Reuters; 2012.
28. Malta M, Cardoso LO, Bastos FI, Magnanini MMF, Silva CMFP. Iniciativa STROBE: subsídios para a comunicação de estudos observacionais [STROBE initiative: guidelines on reporting observational studies]. *Rev Saude Publica*. 2010;44:559-565.
29. Loney PL, Chambers LW, Bennett KJ, Roberts JG, Stratford PW. Critical appraisal of the health research literature: prevalence or incidence of a health problem. *Chronic Dis Can*. 1998;19:170-176.
30. Kennedy P, Kerse N. Pretibial skin tears in older adults: a 2-year epidemiological study. *J Am Geriatr Soc*. 2011;59:1547-1548.
31. Baranoski S. Skin tears: staying on guard against the enemy of frail skin. *Nursing*. 2000;30:41-46.
32. Irving V, Bethell E, Burtin F. Neonatal wound care: minimizing trauma and pain. *Wounds UK*. 2006:2:33-41.
33. LeBlanc K, Christensen D, Orstead H, Keast D. Best practice recommendations for the prevention and treatment of skin tears. *Wound Care Can*. 2008;6:14-32.
34. McLane KM, Bookout K, McCord S, McCain J, Jefferson LS. The 2003 National Pediatric Pressure Ulcer and Skin Breakdown Prevalence Survey: a multisite study. *J Wound Ostomy Continence Nurs*. 2004;31:168-178.
35. Santos VLCG. SCALE: modificações da pele no final da vida [SCALE: Skin changes at life's end]. *Rev Estima*. 2009;7:42-44.
36. Sibbald RG, Krasner DL, Lutz J. SCALE: Skin Changes at Life's End: final consensus statement: October 1, 2009. *Adv Skin Wound Care*. 2010;23:225-236.
37. Nazarko L. Preventing and treating skin tears. *Nurs Residential Care*. 2005;7:549-550.

For an additional continuing education article related to skin tears, go to NursingCenter.com\CE.

Instructions:
- Read the article on page 29.
- The test for this CE activity can be **taken online** at www.NursingCenter.com/CE/JWOCN. Find the test under the article title. Tests can no longer be mailed or faxed.
- You will need to create a username and password and login to your personal CE Planner account before taking online tests. (It's free!) Your planner will keep track of all your Lippincott Williams & Wilkins online CE activities for you.
- There is only one correct answer for each question. A passing score for this test is 13 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Williams & Wilkins: 1-800-787-8985.

Registration Deadline: February 28, 2019

Disclosure Statement: The authors and planners have disclosed that they have no financial relationships related to this article.

Provider Accreditation:

LWW, publisher of the *Journal of Wound, Ostomy and Continence Nursing,* will award 1.0 contact hours for this continuing nursing education activity.

LWW is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 1.0 contact hours. Lippincott Williams & Wilkins is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida, CE Broker #50-1223.

Your certificate is valid in all states.

Payment:
- The registration fee for this test is FREE for members and $12.95 for nonmembers.

DOI: 10.1097/WON.0000000000000304