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INFIRMIÈRES SPÉCIALISÉES EN PLAIES, STOMIES ET CONTINENCE CANADA

Canadian Journal of Wound, Ostomy and Continence

Journal canadien en plaies, stomies et continence

SEPTEMBER 2025 | SEPTEMBRE 2025 VOLUME 1 ISSUE | N° 2

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1. Hollister Clinical Study, CLR-00847, 2021 **2.** Hollister Clinical Study, CLR-00847, 2021 **3.** Hollister Data on File, TR-00643, 2023 **4.** European Association of Urology Nurses (EAUN), Evidence-based Guidelines for Best Practice in Urological Health Care – Catheterisation, Urethral Intermittent in Adults Dilatation, urethral intermittent in adults (2013), pages 25, 33, 47
5. Hollister Data on File, CL-001027 **6.** Hollister Data on File, CL-001015 **7.** European Association of Urology Nurses (EAUN), Evidence-based Guidelines for Best Practice in Urological Health Care –Catheterisation, Urethral Intermittent in Adults Dilatation, urethral intermittent in adults (2013), pages 25, 33, 47 **8.** Hollister Data on file, CL-001017

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Overview / Aperçu

Canadian Journal of Wound, Ostomy and Continence, the official publication of Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC®), is published three times annually. The journal is diamond open access with no publication fees. We accept professional news, research projects, clinical papers, case studies, reports, review articles, clinical questions, and letters to the editor. Feature Articles and Case Studies are peer-reviewed and should be submitted via www.cjwoc.ca.

Le Journal canadien en plaies, stomies et continence (JCPSC) est la publication officielle des Infirmières spécialisées en plaies, stomies et continence Canada (ISPSCC). Il est publié trois fois par année. Nous acceptons des contributions sous forme de nouvelles professionnelles, de revues de la littérature, projets de recherche, d'articles cliniques, d'études de cas, de rapports, de revues d'articles, de questions pour la section clinique et de lettres à l'éditeur. Les articles de fond et les études de cas sont évalués par des pairs et doivent être soumis sur www.cjwoc.ca.

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SCAN TO EXPLORE!

Message from the Editor-in-Chief • Message de la rédactrice en chef

Lina Martins, MScN, BScN, RN, NSWOC, WOCC(C), FNSWOC
Editor-in-Chief, Canadian Journal of Wound, Ostomy and Continence

***"Autumn shows us how beautiful change can be"* – Unknown**

In this second issue of our newly branded, peer-reviewed *Canadian Journal of Wound, Ostomy and Continence (CJWOC)*, we continue to change and grow our publication in response to your feedback requesting more evidence to support the work within our tri-specialty. Immerse yourself in evidence synthesis as you read the scoping review and systematic review within the pages of this issue.

The scoping review authored by Mosa, Jilek, Su, Ketchmark, Ammar, and Kennedy aims to map out and explore the existing literature on pressure injury wound healing with vitamin C supplementation, identifying gaps and key concepts.

Ostomy care is known by many as the foundation of our specialty. It is exciting for us to see researchers and authors delve further into this aspect of our tri-specialty in order to better understand the available evidence and gaps that need addressing. The must-read article authored by Hutton, Prins, Yuan, Solitano, Radford, Vuyyuru, Abushamma, Rieder, and Jairath on behalf of the EndO-trial Consortium is a systematic review that comprehensively identifies, evaluates and synthesizes relevant studies and critically appraises the quality of nursing guidelines for ostomy care.

Our first Guest Editorial by John Gregory, gives us a snapshot of Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC) 44th Annual Conference. This editorial emphasizes the importance of extending our focus beyond the traditional study of etiologies, products, and technologies within our tri-specialty. Aligning with the conference planners' objectives, it encourages us to critically examine our own biases and to strive for the delivery of truly individualized and holistic patient care.

We challenge each and every one of our NSWOC and SWAN colleagues and health care partners to contribute to the change and growth to our association's official publication, CJWOC. Please contact us with your publication proposals; your insights and contributions are valued. •

Louise Forest-Lalande, inf., M.Ed., NSWOC, FNSWOC
Rédactrice du contenu francophone, Journal canadien en plaies, stomies et continence

« L'automne nous montre à quel point le changement peut être magnifique. » – Auteur inconnu

Dans ce deuxième numéro de notre revue nouvellement renommée et évaluée par des pairs, le *Journal canadien en plaies, stomies et continence (JCPSC)*, nous poursuivons l'évolution de notre publication en réponse à vos commentaires, qui demandaient davantage de données probantes pour soutenir le travail dans notre tri-spécialité.

Plongez-vous dans la synthèse des données probantes en lisant la revue de la portée et la revue systématique que vous trouverez dans les pages de ce numéro.

La revue de la portée rédigée par Mosa, Jilek, Su, Ketchmark, Ammar et Kennedy vise à cartographier et explorer la littérature existante sur la guérison des plaies de pression à l'aide de la supplémentation en vitamine C, en identifiant les lacunes et les concepts clés.

Les soins de stomie sont reconnus par plusieurs comme le fondement de notre spécialité. Nous sommes ravies de voir les chercheurs et les auteurs approfondir cet aspect de notre tri-spécialité afin de mieux comprendre les données disponibles et les lacunes à combler.

L'article incontournable rédigé par Hutton, Prins, Yuan, Solitano, Radford, Vuyyuru, Abushamma, Rieder et Jairath, au nom du consortium EndO-trial, est une revue systématique qui identifie, évalue et synthétise de manière exhaustive les études pertinentes, tout en évaluant de façon critique la qualité des lignes directrices infirmières en matière de soins de stomie.

Notre premier éditorialiste invité, John Gregory, nous offre un aperçu du 44e congrès annuel des *Infirmières spécialisés en plaies, stomies et continence Canada (ISPSCC)*. Cet éditorial met en lumière l'importance d'élargir notre champ d'intérêt au-delà de l'étude traditionnelle des étiologies, des produits et des technologies dans notre tri-spécialité.

S'inscrivant dans les objectifs des planificateurs du congrès, il nous encourage à remettre en question nos propres biais et à viser une prestation de soins réellement individualisée et holistique pour nos patients.

Nous lançons le défi à chacun de nos collègues ISPSC, SWAN et partenaires en soins de santé, de contribuer au changement et à l'évolution de la publication officielle de notre association, le JCPSC. N'hésitez pas à nous contacter pour soumettre vos propositions d'articles, vos idées et contributions sont précieuses. •

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Message from the NSWOCC President • Message du président de l'ISPSCC

Corey Heerschap, PhD, MScCH, RN, NSWOC, WOCC(C), FNSWOC
President, Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC)

Président de l'association des Infirmières spécialisées en plaies, stomies et continence Canada (ISPSCC)

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A Time of Transition, Gratitude, and Opportunity

Dear Friends and Colleagues,

It has been quite the eventful past year already, and I wanted to provide an update as we move through into the latter half of 2025 and prepare for some exciting events into 2026. This year, we have had multiple wins, starting with the launch of the *Canadian Journal of Wound, Ostomy and Continence* this past April. We then moved into our highly successful conference held in May, and we now anticipate the *World Council of Enterostomal Therapy Congress*, which will be conducted jointly with Nurses Specialized in Wound, Ostomy and Continence Canada in April 2026. I look forward to the opportunity to see many of you in person at this event.

We have focused this past year on recognizing our members. Launching the Fellowship in Nursing Specialized in Wound, Ostomy and Continence (FNSWOC) is but one example of this. I would also be remiss if I didn't recognize and mention the retirement announcement of our very own Chief Executive Officer, Catherine Harley. Cathy has been with us for over 20 years and has moved our association from a small grassroots organization to an association impacting the lives of those living with wound, ostomy and continence needs across Canada and on a global scale. As we move forward into the latter half of 2025, I want to recognize and thank Cathy for all the hard work these past years and all the lives she has managed to touch. Thank you, Cathy.

The NSWOCC board has now obtained an executive search firm who we will work with to seek out our next CEO. The upcoming months will be quite exciting as we move to secure the future of our association through team expansion and seeking out continued opportunities and ways in which our association can continue to grow and impact the health care of those with wound, ostomy and continence issues. As part of this future, we recognize the rapidly evolving health care landscape, particularly the opportunities presented by advancements such as artificial intelligence. Innovation will remain central to our mission, ensuring that we continue to adapt, grow, and provide leadership in our tri-specialty.•

Une période de transition, de gratitude et d'opportunité

Chers amis et collègues,

L'année écoulée a déjà été des plus mouvementées, et je souhaitais vous en donner un aperçu alors que nous avançons dans la deuxième moitié de 2025 et que nous préparons des événements stimulants en vue de 2026. Cette année, nous avons connu plusieurs réussites, à commencer par le lancement du *Journal canadien en plaies, stomies et continence* en avril dernier. Nous avons ensuite tenu notre congrès annuel en mai, qui fut un grand succès, et nous anticipons maintenant le Congrès du *World Council of Enterostomal Therapists (WCET)*, qui se tiendra conjointement avec Infirmières spécialisées en soins des plaies, des stomies et de la continence Canada en avril 2026. J'ai hâte d'y retrouver plusieurs d'entre vous en personne.

Cette dernière année, nous avons mis l'accent sur la reconnaissance de nos membres. Le lancement de la bourse en soins infirmiers spécialisés en plaies, stomies et continence (FNSWOC) en est un exemple marquant. Je ne saurais non plus passer sous silence l'annonce du départ à la retraite de notre directrice générale, Catherine Harley. Cathy est à nos côtés depuis plus de 20 ans et a transformé notre association, d'un petit organisme communautaire en une association qui impacte la vie des personnes vivant avec des besoins en plaies, stomies et continence partout au Canada et même à l'échelle mondiale. Alors que nous entrons dans la deuxième moitié de 2025, je tiens à reconnaître et à remercier Cathy pour tout son travail acharné au fil des ans et pour toutes les vies qu'elle a touchées. Merci, Cathy.

Le conseil d'administration de l'ISPSCC a maintenant retenu une firme spécialisée en recrutement de cadres avec laquelle nous collaborerons pour trouver notre prochaine PDG. Les prochains mois s'annoncent particulièrement passionnants, alors que nous assurerons l'avenir de notre association par l'expansion de l'équipe et la recherche continue d'occasions et de moyens permettant à notre association de croître et d'avoir un impact sur les soins de santé des personnes ayant des enjeux liés aux plaies, aux stomies et à la continence. Dans cette perspective, nous reconnaissons l'évolution rapide du paysage des soins de santé, en particulier les occasions qu'apportent les avancées telles que l'intelligence artificielle. L'innovation demeurera au cœur de notre mission afin de continuer à nous adapter, à croître et à assurer un leadership dans nos trois spécialités.•

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Message from the Chief Executive Officer • Message de la directrice générale

Catherine Harley, eMBA, RN, IIWCC
Chief Executive Officer,
Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC)

Directrice générale de l'Association des infirmières spécialisées en plaies, stomies et continence Canada (ISPSCC)

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In Appreciation of Volunteers

As we approach the completion of the Canadian Best Practice Recommendations in Wound Care for People Who Use Drugs: A Harm Reduction Approach, I am reminded of the significant contributions that volunteers make to our organization and the communities we support. Focusing on harm reduction teaches us to meet people where they are without judgement and to deliver the best possible wound, ostomy and continence care. Thank you to Lili Berescu and Priyanka Jani for bringing this project forward and seeing it to completion. Your leadership is evident in all you do. I would also like to thank the Harm Reduction Nurses Association and The Ontario Network of People Who Use Drugs for partnering with us to bring both clinical and lived experience to these best practice recommendations.

Volunteers drive positive change and promote inclusion in wound, ostomy and continence care. Your dedication and compassion contribute significantly to the strength of our organization and enhance the experiences of individuals across our diverse health care system. At a time when there is so much uncertainty, you help to stabilize Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC) through your participation, guidance, and inspiration.

On behalf of the NSWOCC team, I want to express my deepest gratitude to each of you for your contributions to our association, regardless of the extent of your involvement. All contributions, whether as a volunteer member of the NSWOCC board, a Core Program Leader, a participant in best practice recommendation development, or as support for various NSWOCC programs and services, are recognized and highly valued. Together, we continue to create and foster an inclusive environment for people with wound, ostomy and continence needs. •

Reconnaissance des bénévoles

À l'approche de la finalisation des recommandations canadiennes de meilleures pratiques en soins des plaies pour les consommateurs de drogues : une approche de réduction des effets secondaires néfastes, je réalise l'importante contribution des bénévoles à notre organisation et aux collectivités que nous soutenons. L'approche de réduction des effets secondaires néfastes nous enseigne qu'il faut rencontrer les personnes là où elles en sont, sans jugement, et à leur offrir les meilleurs soins possibles en matière de plaies, de stomies et de continence. Merci à Lili Berescu et à Priyanka Jani d'avoir porté ce projet et de l'avoir mené à terme. Votre leadership transparaît dans tout ce que vous entreprenez. J'aimerais également remercier l'Association des infirmières en réduction des effets néfastes et le réseau ontarien des consommateurs de drogues pour leur partenariat avec nous, qui a permis d'intégrer à ces recommandations tant l'expertise clinique que l'expérience vécue.

Les bénévoles favorisent des changements positifs et encouragent l'inclusion des soins des plaies, des stomies et de la continence. Votre dévouement et votre compassion contribuent grandement à la force de notre organisation et améliorent l'expérience des personnes au sein de notre système de santé diversifié. En cette période d'incertitude, votre participation, vos conseils et votre inspiration aident à stabiliser les infirmières spécialisées en soins des plaies, des stomies et de la continence Canada (ISPSCC).

Au nom de l'équipe de l'ISPSCC, je tiens à exprimer ma plus profonde gratitude à chacune et chacun d'entre vous pour vos contributions à notre association, quelle qu'en soit l'ampleur. Toutes les contributions, qu'il s'agisse d'un rôle bénévole au sein du conseil d'administration de l'ISPSCC, d'un rôle de responsable de programme central, de la participation à l'élaboration de recommandations de meilleures pratiques, ou d'un appui à divers programmes et services de l'ISPSCC, sont reconnues et hautement appréciées. Ensemble, nous continuons de créer et de promouvoir un environnement inclusif pour les personnes ayant des besoins en matière de plaies, de stomies et de continence. •

geko™ wound therapy

Canadian Consensus Statement: The management of venous leg ulcers

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Harding et al, 2023

Professor Keith Harding

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Dr Robyn Evans

Dr Gary Sibbald

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- *Dr John Hwang*
- *Rosemary Hill*
- *Josee Senechal*
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- *Michele Labbie*
- *Sheri McPhee*
- *Allison Luther*
- *Maryse Beaumier*
- *Helen Arputhanathan*
- *Shannon Handfield*

Read the VLU consensus here:
https://sites.google.com/view/VLUconsensus
or scan the QR code below

1. Bull R et al. Int Wound J. 2023; 1–9
2. Jones N et al. Br J Nurs 2018; 27(20): S16-S21.

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IDEAs – NSWOCC 44th Annual Conference

John Gregory IIWCC, ISWA

President at Opencity Inc

It is an understatement to say that I have attended a few wound, ostomy and continence conferences. How much is there left to say about different etiologies, products, or new technologies? Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC®) demonstrated that the conversations and learnings must continue. This 44th annual conference in Montréal, QC, Canada was enlightening. The conference theme, IDEAs [Inclusivity, Diversity, Equity, Accessibility, shared — *Inclusivite*, *Diversite*, *Equite*, *Accessibilite*, *solidaire*] flowed seamlessly through a myriad of sessions. They are core beliefs of NSWOCC.

There are signs of a seismic shift in Canada as NSWOCs with light skin tones are now advocating for health inequity in skin assessment to rectify years of white supremacy. Rebecca Dyck highlighted how many assessment tools reference skin colour. "They always note it may appear differently in darker skin … let's change the *may*. It **does** appear differently in dark skin, and then we need to go beyond. How does it look different? We need to be specific," says Dyck. Presenters are describing tools as biased, including pulse oximetry and the Apgar score. The familiar body mass index was designed on studies in a now obsolete racial classification. Such surrogate health markers fail to represent the diversity of global population. We need to recognize bias and stigma.

We agree that the skin is the largest organ in the body. Dr. Ray Samuriwo took us on a fascinating exploration of why the structure of the skin and its microbiome vary by different skin tones. Skin tone varies within cultures and even within families. "In terms of being honest about where we are and acknowledging the limitations of the system, we know that people with dark skin tones like mine often receive sub-optimal care, and this is often because they are underrepresented in skin … and wound healing research for variety of different reasons," said Dr. Samuriwo. We wonder what future implications this could have for products or technologies in the fields of wound, ostomy and continence.

Moderator Josh Moralejo thanked Lili Berescu and Priyanka Jani for their session — *Canadian Best Practice Recommendations: Wound Care for People Who Use Drugs — A Harm Reduction Approach*, concluding that we must "listen, acknowledge and respect the lived experiences of persons who use drugs, because as health care professionals here today, how can we provide individualized, holistic and sensitive care if we're not going to be listening to our clients?"

Of course, there were awards recognizing the deserving leaders whose tireless work inspires the next generation. We applaud these role models. Listening to the spouse of the late Dr. Laura Teague accept the *Canadian Journal of Wound, Ostomy and Continence* (CJWOC™) manuscript award was a poignant moment. The manuscript was completed posthumously by Dr. Karen Campbell and acknowledged eight co-authors. Why do I pick out this individual award? Laura's achievements and her husband's vote of thanks epitomize the close-knit community and solidarity among the Canadian clinical community and, indeed, how united the industry is within it.

Again, as one who has attended many NSWOCC conferences, seeing the number of Nurses Specialized in Wound, Ostomy and Continence (NSWOC®) and Skin Wellness Associate Nurse (SWAN™) graduates and the stage packed with members contributing to NSWOCC Board roles and initiatives is a testament to the exceptional growth. It signifies how that deep sense of community inspires emerging leaders in wound, ostomy and continence. A rightful acknowledgment is extended to the National Conference Planning Core Program committee for exemplary leadership and for creating a culture of open discussion at the conference and beyond. This all bodes well for a first-class WCET®/NSWOCC® 2026 Joint Congress in Vancouver, Canada in April 2026.

Well done, NSWOCC, on bringing an informative conference with the IDEAs theme that took us away from our comfort zone talking about etiologies, products and technologies and instead challenged our white supremacy, unconscious biases, pushed us to consider race, gender-affirming surgery, stigma, and harm reduction. It was refreshing and anything but the same old. •

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Each year the NSWOCC President has the privilege of recognizing an NSWOC who has exemplified leadership in the wound, ostomy and continence specialty. The President's Award goes beyond job titles. The award goes to someone who has worked tirelessly, often behind the scenes, to advance our mission, support our community and elevate our specialty in meaningful and lasting ways.

This year the recipient is truly a champion of evidence informed practice. With over twenty years of research and dozens of publications from peer reviewed articles to textbook chapters, to textbooks, this individual is leading change and knowledge development throughout our specialty and profession.

This year's Awardee has been an ambassador for the association at an international level. He has led our association's Research Practice Core Program and assisted with the literature searches for all best practice recommendation documents over the past five years. He has served on the International Skin Tear Advisory Panel and helped found the Canadian Pressure Injury Advisory Panel.

This individual has consistently demonstrated the NSWOCC values of excellence, leadership and collaboration. I am proud to say that I have personally experienced the mentorship that this individual provides first as a PhD supervisor and now as a colleague. I now have the honour of awarding Dr. Kevin Woo with the 2025 NSWOCC President's Award. •

Corey Heerschap, PhD, MScCH, RN, NSWOC, WOCC(C), FNSWOC
President, NSWOCC

doi 10.63354/cjwoc.v1i2.15285

Dr. Corey Heerschap, President, NSWOCC; Dr. Kevin Woo, Recipient of the 2025 NSWOCC President's Award

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Fellows in Nursing Specialized in Wound, Ostomy and Continence – Honouring the Inaugural Fellowship Program Inductees

At Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC), we support a culture that values and celebrates excellence. Recognizing excellence involves acknowledging and celebrating exceptional performance, achievements, or contributions in the tri-specialty of wound, ostomy and continence specialized nursing care. The goal is to motivate individuals and teams to maintain high standards and foster this culture of excellence. By launching a Fellowship Program, NSWOCC has a way to provide prestigious recognition focusing on the careers of certified NSWOCs who have made exemplary contributions to the tri-specialty. This program commenced on May 24, 2025.

On behalf of Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC), I am excited to welcome our first inaugural Fellows. Fellowship represents the highest honour for NSWOCC's most accomplished Nurses Specialized in Wound, Ostomy and Continence (NSWOC) who are leaders in clinical practice, education, administration, research and policy. This Fellowship Program honors exceptional contributions to NSWOCC and the nursing specialty of wound, ostomy and continence. Fellows selected for this program are recognized for their major impact in the field of specialized wound, ostomy and continence care from provincial to national to international settings, where they demonstrate leadership, innovation, and dedication to advancing practice. With demonstrated passion and expertise, Fellows contribute to critical quality initiatives that support effective, evidence-based patient-centered care.

Through this prestigious designation, Fellows exemplify leadership, expertise, and dedication, shaping the future of specialized wound, ostomy and continence nursing practice to positively impact the Canadian health care system. Fellowship powerfully illustrates the many contexts in which NSWOCs across all designations and career paths make an extraordinary and lasting contribution to society. As this Fellowship Program grows, we can work together to increase the impact of this remarkable resource of wisdom and expertise to advance specialized nursing, education, research and policy leadership.

The NSWOCs being inducted as inaugural Fellows reflect a wide diversity of nursing leadership and impact. Every one of these individuals has clearly demonstrated a sustained and powerful commitment to the value of nursing excellence in wound, ostomy and continence specialized care. They are not only inspiring, but they serve as a legacy of the extraordinary leadership contributions they have made.

Front row (left to right) - Nicole Denis, Louise Forest-Lalande, Christine Murphy
Back row (left to right) - Corey Heerschap, Mary Hill, Rosemary Hill, Kimberly LeBlanc, Kevin Woo, Lina Martins

I would like to thank them personally for their dedication and efforts during some very challenging years where they all continued to demonstrate their commitment to their patients, their colleagues and to our association. They did not just show up. They went above and beyond to mentor, support, make change and positively impact patient care, no matter the circumstance. In their role as a Fellow, they will continue to act as mentors to provide ongoing support to NSWOCs and aligned health care professionals working in the tri-specialty of wound, ostomy and continence.

For making a difference for nurses, aligned health care professionals and patients, we salute you. They deserve to hold the credential of FNSWOC – Fellow of Nursing in Wound, Ostomy and Continence, and are worthy holders of this credential. We celebrate you, we recognize you and we look forward to many more NSWOCs following in your footsteps as we move into the future. If you are interested in nominating a colleague for this NSWOCC Fellowship Program, please e mail office@nswoc.ca and the nominations package will be e-mailed to you. •

Catherine Harley, eMBA, RN, IIWCC
Chief Executive Officer , NSWOCC

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Winner of the *Canadian Journal of Wound, Ostomy and Continence* Manuscript Award

The Editorial Board of the *Canadian Journal of Wound, Ostomy and Continence* (CJWOC), which was previously known as *NSWOC Advance*, in collaboration with the Board of Directors and Core Program Leaders of Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC), is pleased to announce that Dr. Laura Teague and her co-authors have been awarded the 2024-2025 CJWOC Manuscript Award.

The manuscript, which earned this distinction, was published in the December 2024 issue of *NSWOC Advance* (Volume 35, Issue 3). The title of the manuscript is Exploring estimation of hospital costs and associated factors among persons with cord injury undergoing surgical closure of stage 4 pelvic pressure injuries. The authors included:

- Laura Teague, PhD, BA, BNSc, MN, NP-Adult, NSWOC
- Gina Browne, PhD, Reg.N., Hon.LL.D
- Lehana Thabane, PhD
- Stephen Birch, PhD
- Colleen McGillvray, BSc, MD, FRCP
- Gary Foster, PhD
- Maya Deeb, BSc, MD, FRCPC
- James Mahoney, MD, FRCSC
- Karen E. Campbell, PhD, MScN, RN, NSWOC, WOCC(C)

This manuscript is grounded in a chapter from Dr. Laura Teague's doctoral research, which was originally completed in July 2020. Dr. Teague began the process of preparing her research for submission to *NSWOC Advance* (now the *Canadian Journal of Wound, Ostomy and Continence*) prior to her passing in November 2023. After her passing, Dr. Karen Campbell—a long-time colleague and friend—took on the role of corresponding author and continued the submission process to ensure Dr. Teague's work would be published as she intended.

In honour of Dr. Laura Teague's significant contributions, the Editorial Team of the CJWOC and the NSWOCC Board are privileged to present this award posthumously to her husband, David Breukelman. •

Lina Martins MScN, BScN, RN, NSWOC, WOCC(C), FNSWOC
Editor-in-Chief, CJWOC

doi 10.63354/cjwoc.v1i2.15861

Laura Teague, PhD, BA, BNSc, MN, NP-Adult, NSWOC

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9. *Primary Health Care Nurse Practitioner Program, Arthur Labatt Family School of Nursing, Western University, London, ON, Canada*

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The Power of Vitamin C: A Scoping Review of Pressure Injury Wound Healing With Vitamin C Supplementation

Abstract

Background

Pressure injuries are a significant health concern in Canada, with the occurrence as high as 26% across all health care settings. Researchers have studied the effectiveness of vitamin C in the healing of pressure injuries. The purpose of this scoping review is to synthesize the existing literature on the role of vitamin C in pressure injury wound healing and identify gaps within the current literature landscape.

Methods

A scoping review of the literature was conducted using the framework developed by Arksey and O'Malley, along with the PRISMA-ScR guidelines. PubMed, Medline, CINAHL, and EMBASE databases were searched for human studies published in English that investigated the effectiveness of vitamin C in reducing wound size and/or accelerating the rate of pressure injury healing. The authors extracted data using a predefined form to summarize information on study type, patient descriptions, study design, interventions, and outcomes.

Results

Nine articles met the review criteria. Six were randomized control trials, and the remaining 3 were observational studies. Seven studies acknowledged the benefit of vitamin C in pressure injury wound healing. One study reported no observed difference in healing within the control and treatment groups, and 1 study did not support the idea of increased vitamin C for wound healing.

Conclusion

The current evidence suggests a possible correlation between vitamin C supplementation and pressure injury wound healing. Research with randomized control trial study designs that have large sample sizes is necessary to investigate the exclusive role of vitamin C and its impact on pressure injury wound healing.

Key Words: Pressure ulcer, pressure injury, bedsore, decubitus ulcer, decubitus injury, ascorbic acid, vitamin C, ascorbate, wound healing

La puissance de la vitamine C : une revue de portée sur la cicatrisation des plaies de lésions de pression avec supplémentation en vitamine C

Résumé

Contexte

Les lésions de pression représentent un problème de santé majeur au Canada, avec une incidence pouvant atteindre 26 % dans l'ensemble des milieux de soins de santé. Des chercheurs ont étudié l'efficacité de la vitamine C dans la cicatrisation des lésions de pression. L'objectif de cette revue de portée est de synthétiser la littérature existante sur le rôle de la vitamine C dans la cicatrisation des plaies de

lésions de pression et d'identifier les lacunes présentes dans la documentation actuelle.

Méthodes

Une revue de portée de la littérature a été réalisée en utilisant le cadre élaboré par Arksey et O'Malley, ainsi que les lignes directrices PRISMA-ScR. Les bases de données PubMed, Medline, CINAHL et EMBASE ont été consultées pour identifier des études sur des sujets humains publiées en anglais qui examinaient l'efficacité de la vitamine C dans la réduction de la taille des plaies et/ou l'accélération du taux de cicatrisation des lésions de pression. Les auteurs ont extrait les données à l'aide d'un formulaire prédéfini afin de résumer l'information sur le type d'étude, la description des patients, la méthodologie, les interventions et les résultats.

Résultats

Neuf articles répondaient aux critères de la revue. Six étaient des essais randomisés contrôlés et les trois autres étaient des études observationnelles. Sept études ont reconnu l'effet bénéfique de la vitamine C sur la cicatrisation des plaies de lésions de pression. Une étude n'a observé aucune différence de cicatrisation entre les groupes témoin et expérimental, et une autre n'a pas appuyé l'hypothèse d'un apport accru en vitamine C pour favoriser la cicatrisation.

Conclusion

Les données actuelles suggèrent une corrélation possible entre la supplémentation en vitamine C et la cicatrisation des plaies de lésions de pression. Des recherches menées sous forme d'essais randomisés contrôlés avec de grands échantillons sont nécessaires afin d'examiner le rôle exclusif de la vitamine C et son impact sur la cicatrisation des lésions de pression.

Mots-clés : ulcère de pression, lésion de pression, plaie de lit, escarre, lésion de décubitus, acide ascorbique, vitamine C, ascorbate, cicatrisation des plaies

Conflicts of Interest:
The authors declare that there are no conflicts of interest regarding the publication of this paper.

Availability of Data and Materials:
The data supporting the findings are available upon request from the author for correspondence.

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INTRODUCTION

Pressure injuries (PIs) are a significant health concern in Canada. The National Pressure Injury Advisory Panel (NPIAP) defines PIs as "localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device."[1] These injuries may appear as intact skin or open areas that can extend down to underlying structures, such as muscle or bone. Pressure injuries can stem from prolonged pressure and/or pressure combined with shear forces, causing increased discomfort.[1] The microclimate, nutrition, perfusion, patient comorbidities, and skin tissue condition may influence soft tissue tolerance to pressure and shear.[1] The NPIAP staging system is used to characterize PIs, detailing the extent of tissue loss and the physical appearance of the injury caused by pressure, friction, and/or shear (Figure 1).[1]

Graves et al.[2] examined data in 2014 from 38 studies conducted in 11 countries that investigated the frequency and occurrence rates of chronic wounds. Pressure injuries were found to be the most common type of chronic wound, with their prevalence ranging from 1.1% to 26.7% in hospitals, 6% to 29% in community care settings, and 7.6% to 53.2% in long-term care (LTC) facilities.[2] Within the Canadian health care system, the occurrence of PIs is notable at 26% across all settings.[3] In addition to the impact of PIs on patients' quality of life, there is also the financial burden to health care systems. In Ontario, it was estimated in 2013 that hospital-acquired PIs can cost in the area of $44,000 for Stage 2, while Stage 4 PIs could cost up to $90,000.[4] Despite attempts to enhance prevention through regulations, the rates of PIs in Canada have not substantially decreased compared to other countries, with ongoing concern regarding their management and prevention.[5]

Adequate nutrition is a fundamental part of skin health. Several essential nutrients in the human body may play a crucial role in the wound healing process. Among these, vitamin C is known to be a principal participant.[6] The daily Recommended Dietary Allowance (RDA) for vitamin C is 75 mg for women and 90 mg for men aged 19 and above.[7] Generally, a well-balanced diet will meet the body's daily requirements for vitamin C.[8] However, diets that do not provide at least 10 mg of vitamin C per day will lead to a deficiency and manifest symptoms, such as fatigue, capillary fragility, and impaired wound healing.[7] Vitamin C deficiency, also known as scurvy, remains a concern in Canada. Dadgar et al.[9] conducted a study examining hospital records in Hamilton, Ontario, over 9 years. They discovered that 52 patients exhibited plasma ascorbic acid (AA) levels below the recommended levels, indicating a scurvy diagnosis.[9] The Health Measures Survey collected biomarkers for vitamin C status in 2012 and 2013, which identified that slightly less than 3% of Canadians had a vitamin C deficiency.[6]

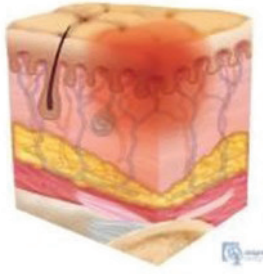
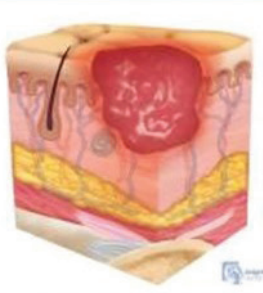
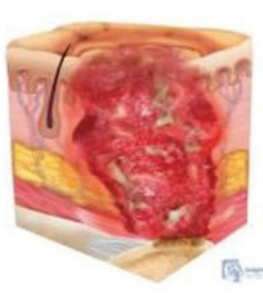
Vitamin C plays a role in all phases of the wound healing process.[6] A study of vitamin C deficient animals with wounds found inadequate collagen and scar formation as well as deviations in fibroblast formation.[10,11] Other more recent studies have added to our understanding of the role this micronutrient plays in the human body.[12,13] However, the scientific community has yet to reach a consensus on the exact amount of vitamin C required for PI wound healing beyond levels that prevent deficiency.[12,13] Implementing evidence-based PI man-

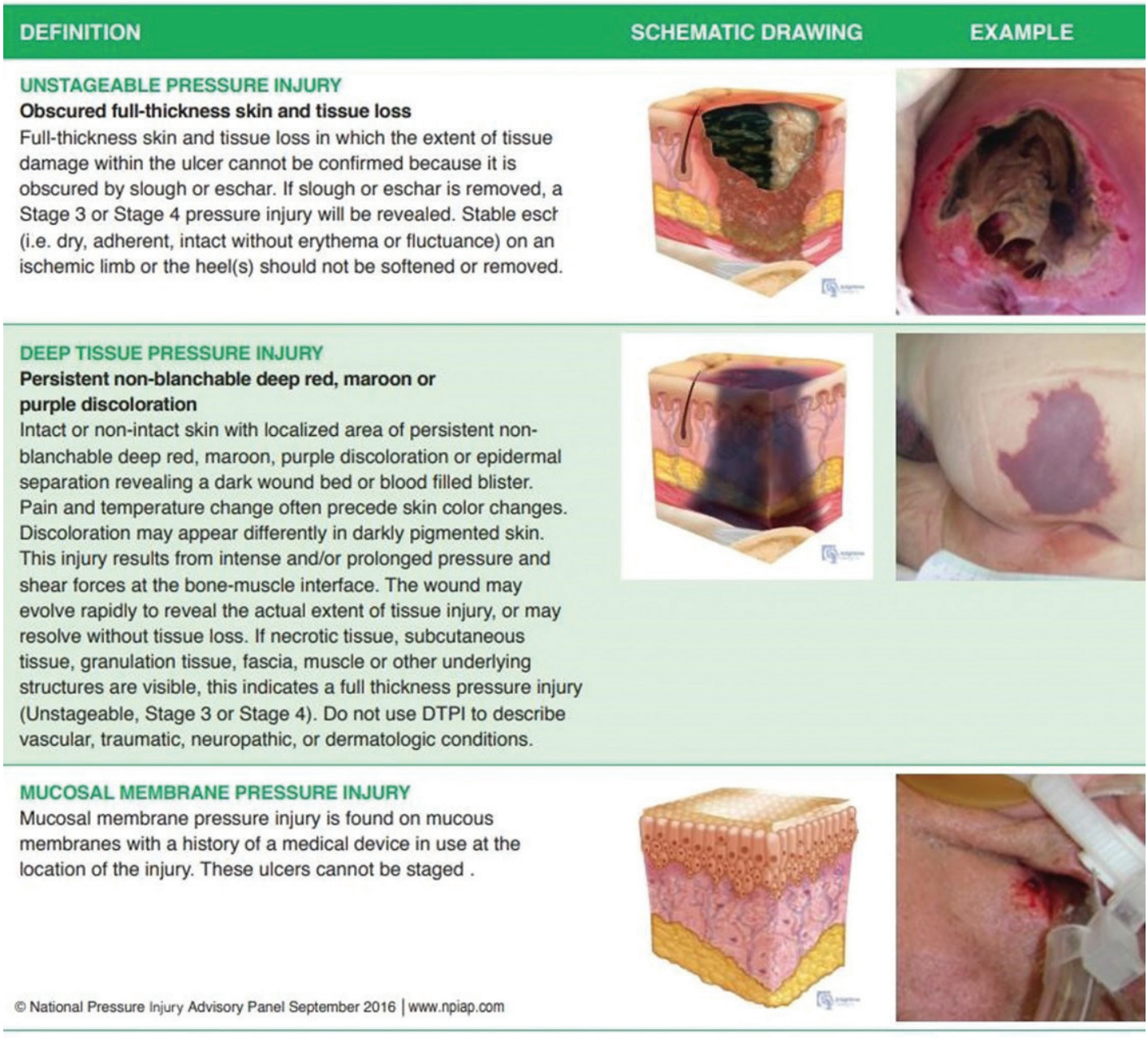
Figure 1: National Pressure Injury Advisory Panel (NPIAP) Pressure Injury and Stages[1]

PRESSURE INJURY AND STAGES

A pressure injury is localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense pressure, prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

NPIAP
NATIONAL PRESSURE INJURY ADVISORY PANEL

DEFINITION	SCHEMATIC DRAWING	EXAMPLE
STAGE 1 PRESSURE INJURY **Non-blanchable erythema of intact skin** Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.		
STAGE 2 PRESSURE INJURY **Partial-thickness skin loss with exposed dermis** Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) is not visible and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARSI), or traumatic wounds (skin tears, burns, abrasions).		
STAGE 3 PRESSURE INJURY **Full-thickness skin loss** Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled wound edges) are often present. Slough and/or eschar may be visible. The depth of tissue damage varies by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.		
STAGE 4 PRESSURE INJURY **Full-thickness loss of skin and tissue** Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.		



From: National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014. Used with permission of the National Pressure Ulcer Advisory Panel June 2024.

agement is crucial. The purpose of this scoping review is to summarize the available literature on the effectiveness of vitamin C for supporting PI healing as well as identify any gaps within the current literature.

METHODS

Protocol and Registration

This scoping review employs the approach outlined by Arksey and O'Malley to comprehensively map, review, and synthesize existing evidence across domains.[14] Evidence will be reported in accordance with the Preferred Reporting Items for Systematic Review and MetaAnalysis extension for Scoping Reviews (PRISMA-ScR) checklist.[15] Unlike systematic reviews, which meticulously assess individual studies, scoping reviews map, review, and synthesize existing evidence across various domains without delving into the fine-grained critique of each study. This makes scoping reviews particularly useful for identifying knowledge gaps and providing an overview of the available literature.

Pressure injury is the term that aligns with the most up-to-date NPIAP terminology. Before this term and staging systems were updated, terms such as bedsores or pressure ulcers (PUs) and staging with Roman numerals were used. This scoping review retains the terminology authors used in their

Table 1: *The Electronic Databases, Search Strategies, and Corresponding Number of Articles*

ELECTRONIC DATABASES	SEARCH STRATEGIES	EXTENT OF SEARCH	NUMBER OF ARTICLES
PubMed https://pubmed.ncbi.nlm.nih.gov (Accessed on 1 March 2024)	(pressure ulcer) OR (pressure injury) OR (pressure sore) OR (bedsore) OR (decubitus ulcer) OR (decubitus injury) AND (ascorbic acid) OR (vitamin c) OR (ascorbate) AND (wound healing)	In all fields	45
Medline https://www.ncbi.nlm.nih.gov (Accessed on 1 March 2024)	(wound healing or wound).tw. or Wound Healing/ AND Ascorbic Acid/ or Ascorbic Acid.tw. or vitamin C.tw. or Ascorbate.tw. AND Pressure Ulcer/ or pressure injury.tw. or pressure ulcer.tw. or bedsore*.tw. or bed sore*.tw. or decubitus ulcer.tw. or decubitus injury.tw.	In all fields	37
CINAHL https://search.ebscohost.com (Accessed on 1 March 2024)	(MH "Pressure Ulcer") OR "Pressure Ulcer or pressure injury or pressure ulcer or bedsore* or bed sore* or decubitus ulcer or decubitus injury" AND (MH "Ascorbic Acid") OR "Ascorbic Acid or Ascorbic Acid or vitamin C or Ascorbate" AND (MH "Wound Healing") OR "wound healing"	In all fields	34
EMBASE https://ovidsp-dc2-ovid-com.proxy1.lib.uwo.ca/ovid-new-b/ovidweb.cgi (Accessed on 1 March 2024)	(wound healing or wound).tw. or Wound Healing/ AND Ascorbic Acid/ or Ascorbic Acid.tw. or vitamin C.tw. or Ascorbate.tw. AND Pressure Ulcer/ or pressure injury.tw. or pressure ulcer.tw. or bedsore*.tw. or bed sore*.tw. or decubitus ulcer.tw. or decubitus injury.tw.	In all fields	68

studies.[16] This scoping review also retains author references to ascorbate or AA, which are other terms for vitamin C.[12]

Inclusion and Exclusion Criteria

This comprehensive review explored published original studies, randomized controlled trials (RCTs), case series, case-control studies, and individual case studies. Only studies published in English that assessed the effects of vitamin C on wound healing were considered. Study inclusion was not limited by publication dates, with consideration given to any study published before March 1, 2024. Inclusion criteria included individuals aged 18 or older with any stage of PI or PU, deep tissue injury, unstageable PI or PU, and/or medical device-related PI that had either oral or enteral AA supplementation.

Exclusion criteria included topical or intravenous vitamin C, non-human studies, non-PI-related wounds, and age less than 18. We excluded non-published or grey literature, commentaries, editorials, and opinion papers as these were not relevant because they were not grounded in scientific principles. Systematic reviews and meta-analyses were also excluded to avoid potential duplication of evidence.

Information Sources and Search

One author used the PubMed, Medline, CINAHL, and EMBASE databases to conduct the search on March 1, 2024, with the assistance of a science librarian, utilizing all identified key words (Table 1). The search terms utilized were pressure ulcer, pressure injury, bedsore, decubitus ulcer, decubitus injury, ascorbic acid, vitamin C, ascorbate, and wound healing.

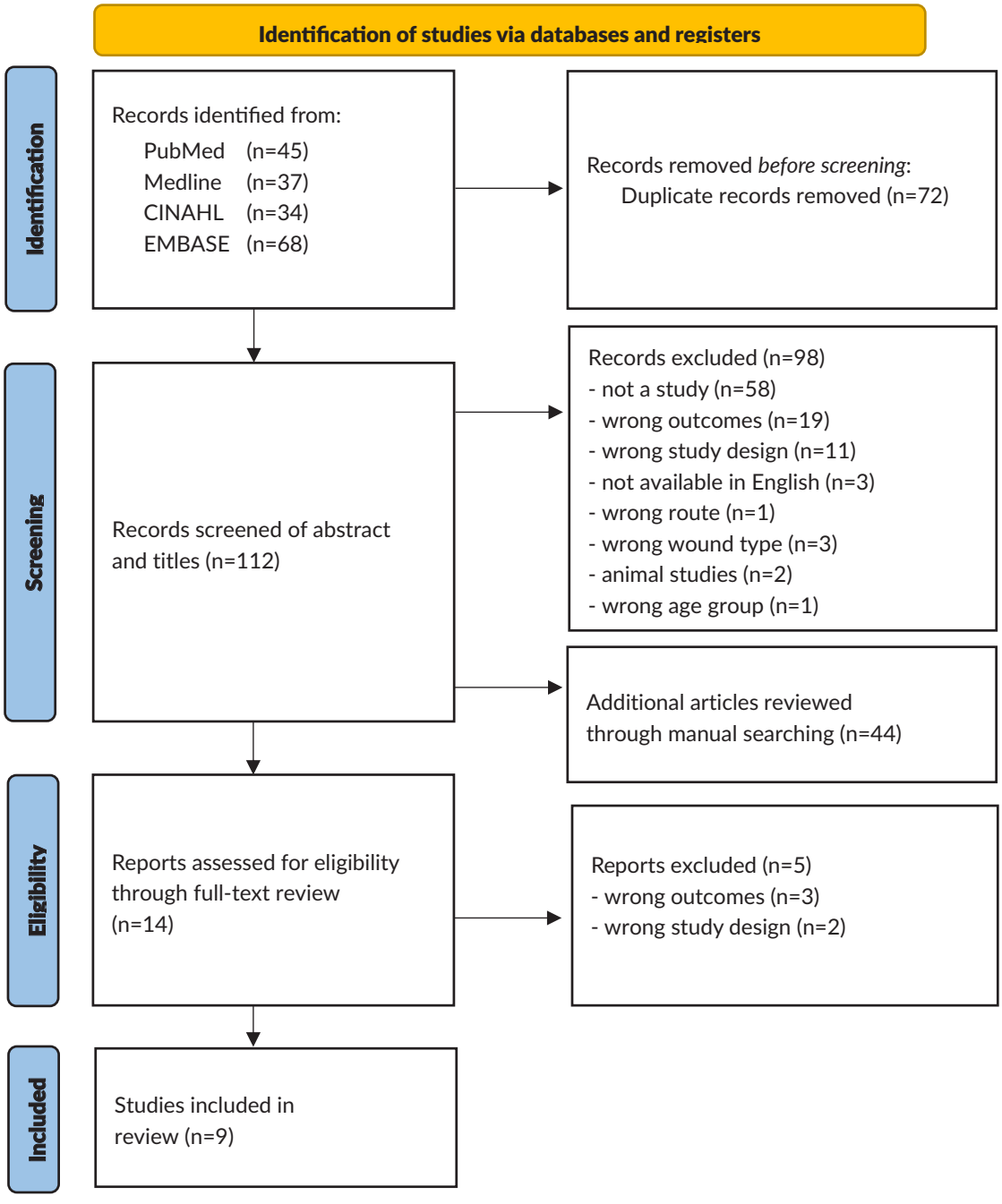
Selection of Sources of Evidence and Data Charting Process

Two independent reviewers evaluated the titles and abstracts of these results to determine whether each article warranted a more in-depth review. The reviewers followed instructions to include articles even when there was insufficient information to establish their relevance definitively. A third author was available if any conflicts arose. Eighteen articles were identified through manual reference list searches and examined to determine if any additional studies met the search criteria. The authors reviewed 14 full articles. All authors discussed results and reached a consensus, with 9 studies meeting the full inclusion criteria (Figure 2).

Data Items and Synthesis of the Results

This scoping review focuses on articles related to vitamin C in the context of the healing of PIs. The authors first collated the relevant information from the selected articles in an Excel spreadsheet for data collection and then synthesized the data into a more comprehensive table in the results. This original spreadsheet documented author names, study title, date, location, intervention(s), comparators, duration, population, aim, methodology, outcome measures, essential results, and any exclusions.

Figure 2: *PRISMA-ScR Study Selection*[5]



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

RESULTS

Selection, Characteristics of Sources of Evidence, and Summary Results

The database search initially yielded 184 publications, but after eliminating duplicate articles and examining titles and abstracts, 14 full-text studies were reviewed, with 9 articles deemed suitable for inclusion.[17-25] All studies investigated the healing of PIs, with 5 studies being RCTs and 4 being observational studies. The studies and their characteristics, including study design, year of publication, type(s) of interventions, study population, and key findings, are summarized in Tables 2 and 3.

Publication dates for the 9 selected studies ranged from 1972 to 2010. These studies looked at vitamin C supplementation on its own, in an oral nutrition supplement (ONS), or as a specific enteral formula and provided patients in the treatment group up to 1000 mg of vitamin C daily.[17-25] Seven of these studies reported an accelerated PI healing rate or significant reduction in PI size.[18-24]

One of the first human studies examining PI wound healing with vitamin C was conducted in 1972 by Burr et al.,[17] who administered 1000 mg of AA daily for 3 days to 7 paraplegic patients who had PIs. The authors analyzed biopsies of these patients' wounds and found that AA stimulated the production of collagen, which is an essential element in accelerating wound healing.[17] This study[17] was one of the first to establish the possible relationship between vitamin C and PI wound healing in humans.

A study by Heyman et al.[18] investigated the impact of a high-protein ONS enriched with arginine, vitamin C, vitamin E, and zinc on healing PUs in 245 nursing home residents over 9 weeks, alongside standard care. Results showed a significant reduction in ulcer size (53%), improved wound healing, and decreased exudation, highlighting the effectiveness of the enriched ONS in supporting recovery($P<0.0001$).[18]

An RCT conducted by Cereda et al.[19] examined whether a disease-specific nutritional approach is more effective than a standard dietary approach for healing PUs. The study included 28 elderly patients with Stage II, III, and IV PUs who were examined in the treatment group over 12 weeks.[19] Patients received either a standard oral diet or a standard enteral formula, with the treatment group receiving added protein, arginine, zinc, and vitamin C.[19] The treatment group had accelerated PU healing ($P<0.05$),[19] with the authors noting that disease-specific nutritional support is both viable and safe to utilize and should be prioritized over the standard approach to enhance the rate of wound healing.[19]

Additionally, a prospective double-blind controlled trial conducted by Taylor et al.[20] studied 20 surgical patients, with those in the treatment group receiving 500 mg of AA twice a day and the control group receiving a placebo. The PIs were assessed using serial photography and wound tracings after 1 month, with the results being statistically significant, indicating that patients in the treatment group had an 84% reduction in PIs compared to 42.7% in the control group ($P<0.05$).[20]

In an RCT Desneves et al.[21] conducted, 16 inpatients with Stage 2, 3, or 4 PUs received a daily standard hospital diet, a standard diet plus 2 high-protein/energy supplements, or a standard diet plus 2 high-protein/energy supplements containing an additional 9 g of arginine, 500 mg of vitamin C, and 30 mg of zinc. Only the group receiving supplementary arginine, vitamin C, and zinc showed a clinically significant improvement in healing, despite no significant changes in biochemical markers, dietary intake, or weight in any of the other groups ($P<0.01$).[21]

In contrast, an RCT by Ter Riet et al[22] published in 1995 reached a different conclusion. Eighty-eight patients with Stage II to Stage IV PUs were randomly selected from 11 nursing homes and 1 hospital in the Netherlands. In the treatment group, 43 patients received a 500 mg AA supplement twice daily, while 45 received 10 mg of vitamin C twice daily in the control group.[22] Surprisingly, the data did not demonstrate a strong correlation between vitamin C and improved healing of PUs (90% CI 0.44 to-1.39).[22] The authors did, however, highlight that vitamin C deficiency can lead to delayed wound healing.[22]

A protein-rich oral nutritional supplement enriched with arginine, vitamin C, and zinc on Stage III and IV PUs was administered to 39 patients over 3 weeks in an open intervention study by Frias Soriano et al.[23] Their results showed a significant (29%) reduction in median wound area ($P<0.001$) and improvements in wound condition, including decreased exudate and necrotic tissue ($P<0.07$).[23]

Another RCT by van Anholt et al[24] administered at multiple facilities demonstrated that over 8 weeks 22 non-malnourished patients receiving ONS appeared to have a significant reduction in the size and severity of Stage III to IV pressure ulcers compared to the control group.[24] These researchers found that patients who showed improved wound healing outcomes had a significantly higher blood vitamin C level than the control group.[24] They concluded that vitamin C is crucial in accelerating wound healing ($p \leq 0.016$), potentially decreasing the frequency of dressing changes and related medical expenses.[24]

A randomized, prospective, controlled, non-blinded study by Theilla et al.[25] analyzed the impact of an enteral feeding formula enriched with eicosapentaenoic acid (EPA), gamma-linolenic acid (GLA), and vitamins A, C, and E on PU healing in critically ill, mechanically ventilated patients with acute lung injury compared to a non-enriched formula given to those in the control group.[25] The authors observed no significant differences in the healing of existing PUs between the treatment and control groups.[25] However, the treatment group demonstrated a significantly lower incidence of new PU development compared to the control group ($p=0.05$).[25]

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* Compared to 3M traditional NPWT foam dressing.

3 Source: Allen D, Robinson T, Schmidt M, Kieswetter K. Preclinical assessment of novel longer-duration wear negative pressure wound therapy dressing in a porcine model. Wound Rep Reg. 2023;31:349-359. Information contained within conducted animal studies has not been evaluated by the U.S. Food & Drug Administration.

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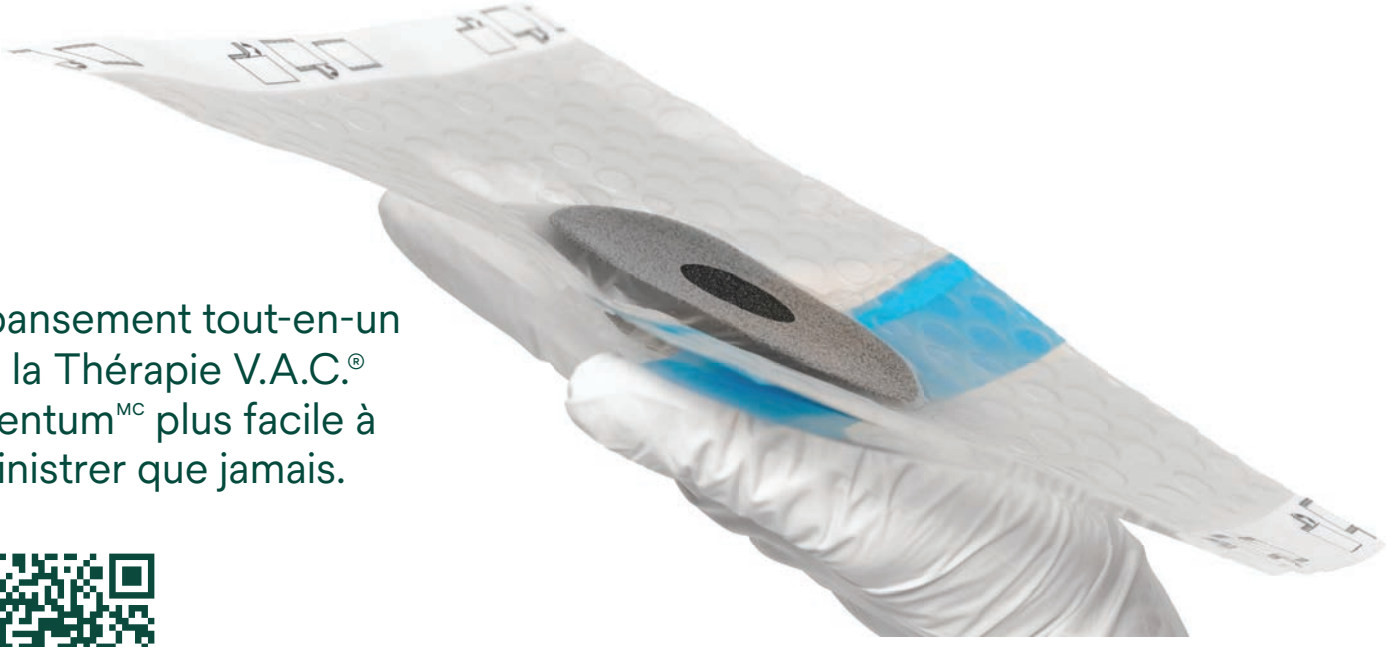

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1 SAT-BSER-05-869347, rapport de l'évaluation sur la sécurité biologique portant sur le V.A.C. Kit de pansement Peel and Place.

2 Lors d'un essai d'utilisation simulé comportant 12 utilisateurs infirmiers et chirurgiens. Temps moyen de 1 min 48 s. SAT-MTF-05-995965, évaluation de marketing portant sur le Solventum V.A.C. Pansement Peel and Place.

* Par rapport à un Pansement en mousse pour thérapie par pression négative 3M[MC] traditionnel.

3 Source : ALLEN, D., T. ROBINSON, M. SCHMIDT et K. KIESWETTER. « Preclinical assessment of novel longer-duration wear negative pressure wound therapy dressing in a porcine model », *Wound Rep. Reg.*, vol. 31 (2023), p. 349-359. L'information contenue dans les études menées chez les animaux n'a pas été évaluée par la Food and Drug Administration des États-Unis.

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Table 2.: *Characteristics and Result Summaries of the Studies Included in the Scoping Review*

AUTHOR (YEAR)	COUNTRY	STUDY TYPE; DESIGN	AIM/PURPOSE	STUDY POPULATION	RESULTS
Burr et al.[17] (1972)	England	Prospective; Case Control Study	Determining the relationship between vitamin C and wound healing by analyzing leucocyte ascorbic acid (LAA) concentration in different populations	Group One: 91 paraplegic patients (52 male, 39 female) Group Two: 41 hospital staff (20 male, 21 female) Subgroup 1: 33 patients with pressure sores (20 male, 13 female) Subgroup 2: Smoking versus non-smoking Subgroup 3: 72 males, 60 females Subgroup 4: 10 experimental group (5 = 500 mg AA BID x 3; 2 = 2 x 250 mg AA BID x 3; 3 = lactose capsules BID)	LAA concentrations were lower in the paraplegic patients than the control group. LAA concentrations were lower in patients with pressure sores than patients without. LAA concentrations for males were lower than for females. LAA lower for smokers than for non-smokers. LAA concentrations of male patients with pressure sores who smoked were significantly lower than the corresponding control subjects ($P<0.05$), and the same was true of the non-smoking female patients. Female non-smokers had significantly higher LAA concentrations than male non-smokers ($P < 0.05$). Biopsy samples from the second biopsy stained for collagen more intensely than those from the first.
Heyman et al.[18] (2008)	Belgium and Luxembourg	Prospective; Open Study	Effects of an oral nutrition supplement (ONS) plus standard care on the healing of European Pressure Ulcer Advisory Panel (EPUAP) grade II–IV pressure ulcers	Intervention Group: Patients with EPUAP grade II–IV PU (n= 245; 157 males, 59 females; mean age of 82.2) received 3 servings of ONS (Cubitan) daily for 9 weeks, along with standard pressure ulcer care Control Group: N/A	A high protein ONS enriched with arginine, vitamin C, vitamin E, zinc significantly decreased the mean PU area over 9-week period. At 3 weeks, the average PU area had significantly reduced from $1580 \pm 3743 mm^2$ to $1103 \pm 2999 mm^2$ ($p<0.0001$). At 9 weeks, the average PU area was $743 \pm 1809 mm^2$, which is a significant reduction of 53% when compared with baseline ($p<0.0001$). Complete wound closure occurred after 3 and 9 weeks in 16 (7%) and 49 (20%) of the PU. Amount of exudate decreased with ONS ($P < 0.0001$).
Cereda et al.[19] (2009)	Italy	RCT; Single- Blind	If disease-specific nutritional approach is more beneficial than a standard dietary approach to healing in elderly subjects with Stage II, III, and IV pressure ulcers	Intervention Group: (n=13; 4 male, 9 female; mean age 82.1) received disease-specific nutrition treatment consisting of the standard hospital diet (at least 30 kcal/ kg per day) plus 400-mL oral supplement or specific enteral formula enriched with protein (20% of the total calories), arginine, zinc, and vitamin C Control Group: (n=15; 6 male, 9 female; mean age of 81.4) received standard hospital diet (at least 30 kcal/ kg per day)	The PUSH score revealed a significant difference at Week 12 ($P<0.05$) and the reduction in ulcer surface area significantly higher in the treated patients within 8 weeks. Those in the intervention group who received a standard hospital diet plus supplement with at least 500 kcal, 34 g protein, 6 g arginine, 500 mg vitamin C, and 18 mg zinc (400 ml) had a higher rate of healing.
Taylor et al.[20] (1974)	Great Britain	Prospective; RCT; Double-Blind	Effectiveness of large doses of AA on the healing of pressure sores on surgical patients	Surgical patients (n=20; 8 male, 12 female; average age of 74.5) Intervention: (n=10) received 1 500 mg AA white tablet twice daily Control: (n=10) received 1 white tablet twice daily	Sixty percent of those in the intervention group completely healed compared to only 30% of those in the control group. Administration of vitamin C significantly improved the healing rate of pressure sores ($P<0.005$).

AUTHOR (YEAR)	COUNTRY	STUDY TYPE; DESIGN	AIM/PURPOSE	STUDY POPULATION	RESULTS
Desneves et al.[21] (2005)	Australia	RCT; Single-Blind	If a standard diet plus 2 high protein supplements containing additional 9 g arginine, 500 mg vitamin C, and 30 mg zinc will improve the rate of PU healing	Total cases: N=16 patients with Stage II–IV PUs according to the Australian Wound Management Association Clinical Practice Guidelines Intervention Group 1: (n=6; 4 male, 2 female) received a standard hospital diet Intervention Group 2: (n= 5; 3 males, 2 females; mean age 83.2) received a standard diet plus 2 high-protein/energy supplement Intervention Group 3: (n=5; 3 males; 2 females) a standard diet plus 2 high-protein/energy supplements containing additional arginine (9 g), vitamin C (500 mg), and zinc (30 mg)	Baseline PUSH scores were similar between groups (8.7 +/- 0.5). Patients receiving additional arginine, vitamin C, and zinc demonstrated a clinically significant improvement in pressure ulcer healing (9.4 +/- 1.2 vs. 2.6 +/- 0.6; baseline and week 3, respectively; p<0.01).
Ter Riet et al.[22] (1995)	Netherlands	RCT; Double-Blind	Effectiveness of 500 mg AA in the treatment of PUs	Total cases: (n= 88) patients with Stage II–IV PUs Intervention Group: (n=43) received 500 mg AA BID Control Group: (n=45) received 10 mg ascorbic acid twice daily	There was no difference noted in those receiving AA verses those in the control group (HR 0.78, 90% CI 0.44 to -1.39). Supplementation of vitamin C does not accelerate PU healing.
Frias Soriano et al.[23] (2004)	Spain	Prospective; Open Cohort Study	Effectiveness of an oral supplement that is rich in protein, arginine, vitamin C, and zinc in the healing of PUs	Total cases: (n=39) patients with Grade III or IV PUs	A significant increase in granulation tissue after 1 week was noted with a significant decrease in incidences of infection (p=0.008; p=0.008) and a decrease in incidence of necrotic tissue (p=0.07). After 3 weeks, the median PU area reduced from 23.6 cm^2 to 19.2 cm^2 ($P < 0.001$). Nutritional supplements that are rich in protein, arginine, vitamin C, and zinc resulted in a significant reduction in wound area and improved wound condition.
van Anholt et al.[24] (2010)	Czech Republic, Belgium, The Netherlands, and Curacao	RCT; Double-Blind	To determine if the addition of a high-protein, arginine- and micronutrient-enriched ONS will improve healing of PU in non-malnourished patients	Total cases: (n=43) with pressure ulcers grade 3 or 4 using EPUAP Intervention Group: (n=22) received a high-energy supplement enriched with arginine, antioxidants, and other micronutrient oral supplements Control Group: (n=21) received non-caloric, flavoured placebo (similar in taste and appearance)	There was accelerated PU healing in the intervention group compared with the control in 8 weeks ($p \leq 0.016$).
Theilla et al.[25] (2007)	Israel	RCT; Non-Blinded	To compare a high-fat and low-carbohydrate enteral formula which was enriched in lipids vitamins A, C, and E with a high-fat and low-carbohydrate enteral formula in PU development and healing affects in patients suffering from acute lung injury	Total cases: (n=95) patients suffering from acute lung injury. Intervention Group: (n=46; 7 PU) received a high-fat, low-carbohydrate enteral formula enriched. Control Group: (n=49; 14 PU) received a high-fat, low-carbohydrate enteral formula.	No difference was observed in the healing of existing pressure ulcers in the study as opposed to the control group. There was a significantly lower rate of occurrence of new PUs observed in the study group compared to the control group (p<0.05). There were 8 new PUs in the intervention group compared to 10 in the control group (RR 0.85, 95% CI 0.37 to 1.97; p=0.71).

Table 3: *Summary of Included Studies*

AUTHOR (YEAR)	TREATMENT GROUP	CONTROL GROUP	ROUTE OF ADMINISTRATION	MEASUREMENT OF HEALING
Burr et al.[17] (1972)	1. 500 mg of AA BID for 3 days (n=5) 2. 250 mg x 2 AA BID for 3 days (n=2)	Placebo capsule BID for 3 days (n=3)	Oral	1. Biopsy 2. Histological photograph
Heyman et al.[18] (2008)	Three servings a day of ONS taken in addition to their normal diet or enteral feed for 9 weeks Per 200 ml ONS serving provides 250 kcal/20 g protein, 3 g arginine, 250 mg vitamin C, 38 mg vitamin E, and 9 mg zinc, plus other micronutrients	No control	Oral	1. Measurement (L x W) with a ruler 2. Subjective assessment (exudate, necrotic tissue, and signs of infection)
Cereda et al.[19] (2009)	Disease-specific nutrition treatment consisting of the standard diet plus a 400-mL oral supplement or specific enteral formula enriched with protein, arginine, zinc, and vitamin C (n=13)	Standard nutrition (hospital diet or standard enteral formula) (n=15)	Oral or Enteral	1. PUSH Tool 2. Area measurement (mm^2 and %)
Taylor et al.[20] (1974)	500 mg AA BID for 4 weeks (n=10)	Placebo BID for 4 weeks (n=10)	Oral	1. Subjectively by staff 2. PI tracing independently 3. Weekly photographs
Desneves et al.[21] (2005)	1. Standard hospital diet plus 2 tetrapaks of a defined arginine-containing supplement, supplying additional 2100 kJ (500 kcal), 21 g protein, 0 g fat, 500 mg vitamin C, 30 mg zinc, and 9 g of arginine (n=6) for 3 weeks 2. Standard hospital diet plus 2 tetrapaks of a high-protein, high-energy supplement providing an additional 2100 kJ (500 kcal), 18 g protein, 0 g fat, 72 mg vitamin C, and 7.5 mg zinc (n=5) for 3 weeks	Standard hospital diet (n=5) for 3 weeks	Oral	1. PUSH Tool
Ter Riet et al.[22] (1995)	500 mg AA twice daily (n=43) for 12 weeks in addition to standardized treatment	10 mg AA twice daily (n=45) for 12 weeks in addition to standardized treatment	Oral	1. Weekly photographs
Frias Soriano et al.[23] (2004)	ONS (250 calories, 20 g protein, 250 mg vitamin C, 37.6 mg vitamin E, and 9 mg zinc) daily for 3 weeks (n=39)	No control	Oral	1. Subjective assessment by staff 2. Surface area measurement
van Anholt et al.[24] (2010)	High-energy supplement enriched with arginine, antioxidants, and other micronutrient oral supplements (n=22) for 8 weeks	Non-caloric, flavoured placebo (n=21) for 8 weeks	Oral	1. Measurement (L x W) with a ruler 2. Surface area measurement
Theilla et al.[25] (2007)	High-fat, low-carbohydrate, enteral formula enriched in lipids (eicosapentaenoic acid (EPA), gamma-linolenic acid (GLA)), and vitamins A, C, and E (n=46)	High-fat, low-carbohydrate, enteral formula (n=49)	Enteral	1. Subjective assessment using NPUAP Staging by researchers

DISCUSSION

This scoping review has some limitations. Despite the extensive literature search conducted with several large databases, the number of studies looking at vitamin C and PI healing specifically was limited, so the inclusion criteria were broader than desired. In addition, variability among the populations studied, such as differences in the culture, nationality, and gender of the patients, makes it difficult to determine whether these variances might account for the differences in results between studies.

Furthermore, the amount of vitamin C was not always consistent across the studies examined, and some studies offered treatment groups other nutrients, protein, or calories in addition to vitamin C. For example, 1 study included 250 mg of vitamin C in the ONS formula, which provided 250 calories, 20 g of protein (3.0 g of arginine), 37.6 mg of vitamin E, and 9.0 mg of zinc, all of which were administered for 3 weeks.[23] Another study that investigated the use of ONS had a formula containing 575 mg of vitamin C, 46 g of protein (6.9g of arginine), 87 mg of vitamin E, and 21 mg of zinc for 9 weeks.[18]

The measurement of PI healing also varied across studies, with some utilizing validated tools, such as the Pressure Ulcer Scale for Healing (PUSH Tool), and others relying on subjective assessment, either physically or with serial photography.

The majority of studies that examined the effect of vitamin C on its own, in an enteral formula, or an ONS observed positive results on PI healing.[17-21,23,24] However, many of the patients in the treatment groups also received macronutrients in varying quantities as well as other micronutrients, which makes it challenging to decipher if vitamin C alone impacted the healing ability of PIs.[17–21,23,24]

The methodological diversity of the included studies poses both strengths and challenges. Most studies had small sample sizes, heterogeneity in PI severity and patient populations, and variability in intervention durations, which limit the generalizability of findings.[17-25] Vitamin C levels were not consistently monitored, leaving gaps in understanding the mechanistic pathways underlying the observed effects.[17-25]

In the study by Heyman et al.,[18] the authors reported a significant reduction in the mean PU area with ONS; however, this study lacked a control group or exclusion criteria, which leaves room for variability and likely impacted the study's results.[18]

Desneves et al.[21] came to a similar conclusion in their investigation of supplementation with ONS and/or enhanced nutrients (arginine, vitamin C, and zinc) in addition to a standard hospital diet. While the sample size was much smaller, this RCT was more robust in its methods.[21] The authors used a validated wound assessment tool (PUSH tool), utilized appropriate blinding, and had a control group and almost perfect compliance with ONS consumption.[21]

Theilla et al.[25] observed no difference in healing rates in their treatment group that received an enriched enteral feed compared to those in a standard enteral feeding group. However, the treatment group experienced fewer new PU developments, suggesting a potential preventive benefit rather than a therapeutic effect.[25] This study was non-blinded, had a small sample size with short follow-up, and may have been impacted by inter-rater variability.

The only study that did not support the idea of vitamin C supplementation for improving the healing rate of PIs did recognize the human body's need for adequate vitamin C levels and noted that scurvy can lead to delayed wound healing.[22] In this study, patient comorbidities and immobility could have been confounding factors, impacting the validity of the results.

Of the 9 studies that met the inclusion criteria for this scoping review, only 3 examined the impact of vitamin C alone on PI healing.[17,20,22] Of these, only 2 were RCTs, and both used the same dosage of vitamin C in their treatment groups.[20,22] However, all 3 studies had small sample sizes with confounding factors, such as comorbidities and baseline nutritional status, which makes generalizability of the findings difficult.[17,20,22]

Studies investigating ONS enriched with arginine, zinc, and vitamin C reported substantial reductions in wound size, improved wound conditions, and higher healing rates.[18,19,21,24] This also decreases the reliability on the effectiveness of vitamin C alone, as other nutrients, along with increased calories and protein, were provided to treatment groups in these studies.[18,19,21,24] It is well known that insufficient intake or an imbalance of energy, protein, and other nutrients can cause malnutrition, which can make people more susceptible to skin breakdown and prevent healing.[26,27] This fact, along with the findings of the ONS studies, supports the notion that enhanced nutritional interventions may be more effective than standard diets in addressing the unique metabolic demands of patients with PIs.

It is evident from this scoping review that, in addition to regular preventive therapy for patients at risk of PIs, nutritional treatment with enhanced vitamin C and other nutrients appears to have a positive effect on PI healing. It cannot be proven that vitamin C alone is successful in enhancing PI healing without more research, which should aim to refine our understanding of the specific effects of vitamin C dosage to support the optimization of intervention strategies to maximize therapeutic potential.

CONCLUSION

Pressure injuries have a substantial impact on a patient's quality of life and pose a financial burden to the Canadian health care system. Vitamin C is a micronutrient that is crucial for wound healing, and scurvy remains a concern in Canada. Any advancements in wound management knowledge that

lead to more effective treatments would be beneficial for health care providers and individuals. This scoping review investigated current research on vitamin C and PI wound healing to summarize the existing literature and identify gaps. The current evidence suggests a possible association between vitamin C supplementation and PI wound healing. There is insufficient evidence to draw conclusions about the actual effect of vitamin C on PI healing, so the authors cannot make any recommendations based on the current literature. Some limitations of this review include variability in the populations studied, inconsistent vitamin C dosages, and varying measurement methods for PI healing, all of which may impact the interpretation of the results. Research with RCT study designs conducted in the Canadian population that have large sample sizes is necessary to investigate the exclusive role of vitamin C and its impact on PI wound healing. •

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A Systematic Review & Quality Assessment of Clinical Practice Nursing Guidelines for Ostomy Care

Abstract

Background

People living with an intestinal stoma require specialized interdisciplinary care throughout their surgical journey and beyond. As part of the Endpoint Development for Ostomy Clinical Trial (EndO-trial) Consortium for patients with Crohn's disease and permanent ileostomies, we evaluated nursing guidelines focused on the clinical management of people living with intestinal ostomies, identified knowledge and system gaps, and supported the development of evidence-based patient care pathways.

Methods

We conducted a systematic literature search across Medline, EMBASE, CINAHL, and major nursing organization websites up to March 25, 2024, to identify evidence-based guidelines nursing organizations developed for caring for patients with intestinal stomas post-ostomy formation. The authors summarized the evidence and critically appraised it using the AGREE II Instrument.

Results

Fourteen nursing guidelines from Australia, Canada, Italy, the United Kingdom (UK), the United States of America (USA), and 3 international working groups, ranging from 2013 to 2023, met the inclusion criteria. These guidelines offer extensive coverage of ostomy care topics and provide valuable first-line care experience and consensus statements, particularly for postoperative stoma and peristomal care. In the AGREE II assessment, most guidelines were rated as moderate quality (scores <6), with recommended modifications primarily in the rigor of development and applicability.

Conclusion

Critical appraisal of clinical practice nursing guidelines for ostomy care highlights both strengths and areas for improvement and expansion within existing guidelines. These insights are essential for non-nursing health care providers and contribute to the development of patient care pathways for individuals with Crohn's disease and permanent ileostomies.

Key Words: Nursing, guidelines, ostomy, ileostomy, stoma

Revue systématique et évaluation de la qualité des lignes directrices en soins infirmiers pour les soins de stomie

Résumé

Contexte

Les personnes vivant avec une stomie intestinale nécessitent des soins interdisciplinaires spécialisés tout au long de leur parcours chirurgical et au-delà. Dans le cadre du consortium de développement de critères d'évaluation pour les essais cliniques (EndO-trial) auprès de patients atteints de la maladie de Crohn et ayant une iléostomie permanente, nous avons évalué les lignes directrices infirmières portant sur la prise en charge clinique des personnes vivant avec une stomie intestinale,

identifié les lacunes de connaissances et organisationnelles, et appuyé le développement de parcours de soins fondés sur des données probantes.

Méthodes

Nous avons réalisé une recherche systématique de la littérature dans Medline, EMBASE, CINAHL et sur les principaux sites internet d'organisations infirmières jusqu'au 25 mars 2024 afin d'identifier les lignes directrices fondées sur des données probantes élaborées par des organisations infirmières pour le suivi des patients avec une stomie intestinale après la chirurgie. Les auteurs ont résumé les données probantes et procédé à une évaluation critique à l'aide de l'outil AGREE II.

Résultats

Quatorze lignes directrices infirmières provenant d'Australie, du Canada, d'Italie, du Royaume-Uni, des États-Unis et de trois groupes de travail internationaux, publiées entre 2013 et 2023, répondaient aux critères d'inclusion. Ces lignes directrices couvrent de façon étendue les sujets liés aux soins de stomie et fournissent des indications précieuses de soins de première ligne ainsi que des énoncés consensuels, en particulier pour les soins postopératoires de la stomie et de la peau péristomiale. Dans l'évaluation avec AGREE II, la majorité des lignes directrices ont été classées comme étant de qualité modérée (résultats < 6) les modifications recommandées portant principalement sur la rigueur de l'élaboration et l'applicabilité.

Conclusion

L'évaluation critique des lignes directrices en soins infirmiers pour les soins de stomie met en évidence à la fois les forces et les aspects à améliorer et à développer dans les lignes directrices existantes. Ces constats sont essentiels pour les fournisseurs de soins de santé non infirmiers et contribuent à l'élaboration de parcours de soins pour les personnes atteintes de la maladie de Crohn et ayant une iléostomie permanente.

Mots-clés : soins infirmiers, lignes directrices, stomie, iléostomie

Conflicts of Interest:

- MH, HP, SR, SA have none to disclose.
- YY: consulting fees from Alimentiv.
- VS: speaker's fees from Pfizer.
- SV: consulting fees from Alimentiv.
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Availability of Data and Materials:

This systematic review did not involve the collection of primary data. The data supporting the findings are available in the supplemental files or can be accessed through the published references cited in the manuscript.

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INTRODUCTION

An ostomy is a surgical procedure that creates an intestinal opening on the abdomen's surface, allowing luminal content to exit the body by bypassing the usual pathways. The most common ostomies are a colostomy and ileostomy (temporary or permanent) for diversion of the fecal stream.[1] They are performed in people with conditions such as colorectal cancer, inflammatory bowel disease (IBD), including Crohn's disease (CD) and ulcerative colitis (UC), and following trauma. Approximately 50% of individuals diagnosed with CD require surgical intervention within 10 years of diagnosis, and more than 10% may ultimately need a permanent ileostomy (PI).[2] Nevertheless, an ileostomy is seldom curative, and small bowel clinical recurrence of CD occurs in roughly 27% of patients following total colectomy with permanent ileostomy.[3]

Complications after an ostomy vary and can include skin irritation, granulomas, parastomal psoriasis and parastomal hernia, pyoderma gangrenosum, and others such as stomal or peristomal bleeding, stoma prolapse, and retraction. Many factors are associated with peristomal skin complications.[4] The presence of a stoma also significantly impacts persons' health-related quality of life (HRQoL). The global prevalence of anxiety (48%) and depression (39%) in people living with an ostomy is high.[5] Each type of ostomy and the associated

complications require careful and holistic management to ensure that the person living with an ostomy has a good quality of life and to prevent further health issues.

People living with an intestinal stoma require specialized care throughout their surgical journey and beyond. The standard care for prevention and treatment of stoma complications can be inconsistent.[6] Stoma nurse specialists play a crucial role in caring for and supporting patients with intestinal stomas by utilizing evidence-based practices and specialized expertise.[7] Nursing interventions can improve self-efficacy, enhance self-care and self-management, lead to a reduction in adverse outcomes and ostomy complications, and increase patient satisfaction.[8]

To aid in the delivery of effective ostomy care, many organizations, including nursing organizations, have developed clinical practice guidelines. The standards of wound, ostomy, and continence (WOC) nursing practice include several components of the nursing process, including assessment, diagnosis, outcomes identification, planning, implementation, coordination of care, health teaching and health promotion, and evaluation.[9] These guidelines provide valuable insights not only for nurses but also for other clinicians. To date, only 2 systematic reviews have evaluated clinical practice guidelines for ostomy care. One included 5 guidelines,[10] the other included 10 guidelines.[11] Both targeted health care professionals without focusing on nursing guidelines.

The Endpoint Development for Ostomy Clinical Trial (EndO-trial) Consortium, funded by the Helmsley Charitable Trust (USA), is dedicated to addressing the gaps in care provision for people living with an ostomy, including developing structured clinical care pathways for patients with CD and PI through several interconnected workstreams. As part of the consortium, we aim to systematically review and evaluate the nursing guidelines that focus on the management of patients with intestinal ostomies, identify the knowledge gaps from the perspective of nursing care, and provide evidence to support the development of evidence-based patient care pathways and guidelines for patients with CD and PI.

METHODS

We conducted a systematic review focusing on the nursing guidelines intended for nurses caring for people with intestinal stomas before and after surgery, specifically focusing on ileostomies. We followed the PRISMA-2020 Checklist for reporting systematic reviews (Table 1 is available online: https://cjwoc.ca/index.php/cjwoc/article/view/14197).[12]

Literature Search

We searched the following databases for nursing guidelines from inception to March 25, 2024: Medline (Ovid, from 1946-); EMBASE (Ovid, from 1974-), using a validated guideline filter. We searched MeSH or Emtree terms as well as free text words related to ostomy, ileostomy, and stoma in combination with terms related to nurse or nursing, with validated design filters for guidelines and recommendations applied. We limited the search to English language studies and excluded conference abstracts (Figure 1). We also searched the Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCOhost from 2010, the Guidelines International Network (GIN), and the 10 large nursing organizations' and ostomy associations' websites in Australia, Canada, New Zealand, the UK and the USA (Figure 1).

We imported references into Covidence (https://www.covidence.org/), and at least 2 authors (MH, HP, YY) who Covidence randomly assigned screened each record independently. Consensus was discussed with conflict resolved. We conducted a recursive manual search of the bibliography of eligible guidelines to retrieve eligible nursing guidelines. To reflect current practice guidance, we only included guidelines published since 2010.

Selection Criteria

We used a definitive list of inclusion and exclusion criteria.

Inclusion Criteria

- Guidelines developed by nursing organizations and aimed at nurses as major users.
- Guidelines aimed at nurses caring for patients with abdominal stomas following ostomy, including ileostomy.
- Guidelines included recommendations for preoperative, perioperative, postoperative, and post-discharge nursing interventions, which could include but are not limited to preoperative stoma site marking, preoperative counselling, postoperative skin care, postoperative education, post-discharge support, and complications prevention and management.
- Guidelines developed based on evidence-based approaches, including literature search, systematic reviews, and level of certainty of evidence assessment; or guidelines declared they were evidence-based. If the evidence was limited or there was no evidence, consensus was reached via rigorous methodology (e.g., Delphi approaches).
- Guidelines published after 2010.

Exclusion Criteria

- Guidelines developed by other professional organizations that are not aimed at nurses as major users (e.g., those aimed at surgeons or intended for all health care professionals as general management guidelines), even if they invited nurses to participate in their development or mentioned the role or value of ostomy nurses.
- Guidelines focused solely on urostomy.
- Guidelines focused on patients with cancer.
- Guidelines specific to nursing practice discipline or scope and standards of Nurses Specialized in Wound, Ostomy and Continence (NSWOC) practice.

Figure 1: *Search Strategy*

DATABASE: EMBASE <1974 TO 2024 MARCH 22>, OVID MEDLINE(R) ALL <1946 TO MARCH 22, 2024>

1 (guideline or practice guideline or consensus development conference or consensus development conference, NIH).pt. (48151)
2 (guideline* or standards or consensus* or recommendat*).ti. (454407)
3 (practice parameter* or position statement* or policy statement* or CPG or CPGs or best practice*).ti. (42728)
4 (care adj2 (path or paths or pathway or pathways or map or maps or plan or plans or standard)).ti. (22968)
5 ((critical or clinical or practice) adj2 (path or paths or pathway or pathways or protocol*)).ti. (11649)
6 (algorithm* and (pharmacotherap* or chemotherap* or chemotreatment* or therap* or treatment* or intervention*)).ti. (9861)
7 (algorithm* and (screening or examination or test or tested or testing or assessment* or diagnosis or diagnoses or diagnosed or diagnosing)).ti. (11217)
8 (guideline* or standards or consensus* or recommendat*).au. (36)
9 (guideline* or standards or consensus* or recommendat*).co. (2295)
10 (guideline* or standards or consensus* or recommendat*).ca. (1969)
11 systematic review.ti,pt,kf,sh. and (practice guideline* or treatment guideline* or clinical guideline* or guideline recommendation*).ti,ab,kf. (14083)
12 or/1-11 (574309) [guideline filter]
13 exp nursing/ or exp nursing care/ (686774)
14 (nurse or nurses or nursing or telenursing).ti,ab,kw,kf. (1154629)
15 (nurse or nurses or nursing).so. (126256)
16 (nurse or nurses or nursing).in. (806066)
17 (nurse or nurses or nursing).jn. (22540)
18 (nurse or nurses or nursing).jw. (1089239)
19 (nurse or nurses or nursing).go. (9315)
20 nu.fs. (137473)
21 (nurse or nurses or nursing).af. (2388212)
22 or/13-21 (2507794) [nursing terms]
23 12 and 22 (46849)
24 Ileostomy/ (25419)
25 (Ileostomy or ileostomies or colostom*).ti,ab,kw,kf. (41063)
26 ((stoma or stomas or parastoma*) adj5 (entero* or instetinal* or ileo* or ileum or bowel or gut or abdom* or colo*)).ti,ab,kw,kf. (5981)
27 ((ostomy or ostomies) adj5 (entero* or instetinal* or ileo* or ileum or bowel or gut or abdom* or colo*)).ti,ab,kw,kf. (1330)
28 (stoma or stomas or parastom* or ostomy or ostomies or ileostomy or ileostomies).ti. (16783)
29 or/24-28 (60979) [ostomy terms]
30 23 and 29 (185)
31 remove duplicates from 30 (107)
32 limit 31 to english language (104)
33 conference abstract.pt. (5088203)
34 32 not 33 (97)

Note: lines 1-12. Guidelines filter - Standard - MEDLINE, Embase, PsycInfo. In: CADTH Search Filters Database. Ottawa: CADTH; 2024: https://searchfilters.cadth.ca/link/25. Accessed 2024-03-22.

DATABASE: CINAHL (VIA EBSCOHOST)

S1 TX (ostom* or colostom* or ileostom* or stoma*)
S2 TX (nurse or nurses or nursing)
S3 S1 AND S2
S4 S3. Limiters - Publication Date: 20100101-20251231; English Language; Exclude MEDLINE records; Any Author is Nurse; Publication Type: Practice Guidelines; Language: English
We also searched the Guidelines International Network (https://guidelines.ebmportal.com/) and 10 large nursing organizations' and Ostomy associations' websites in Australia, Canada, New Zealand, the UK, and the USA, including:
The Australian Association of Stoma Therapy Nurses (AASTN) (https://stomaltherapy.au/);
The Association of Coloproctology of Great Britian & Ireland (ACPGBI) (https://www.acpgbi.org.uk/default.aspx);
The Association of Stoma Care Nurses UK (ASCNUK) (https://ascnuk.com/);
The Global Paediatric Stoma Nurses Advisory Board (GPSNAB) (https://www.coloplastprofessional.co.uk/stoma/clinical-evidence);
Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC) (https://www.nswoc.ca/bpr);
The New Zealand Nurses Organisation College of Stomal Therapy (NZNOCSTN) (https://www.nzno.org.nz/);
The Ostomy Canada Society (OCS) (https://www.ostomycanada.ca/);
The Registered Nurses' Association of Ontario (RNAO) (https://rnao.ca/bpg/guidelines/ostomy);
The United Ostomy Association of America (UOAA) (https://www.ostomy.org/); Wound, Ostomy and Continence Nurses Society (WOCN) (https://www.wocn.org/);
The World Council of Enterostomal Therapists (WCET) (https://wcetn.org/).

- Nursing guidelines not related to stoma management and care (e.g., focusing on debridement).
- Nursing guidelines or position statements with no indication of an evidence-based approach (e.g., no literature search, systematic review, or assessment of the level of evidence).
- Primary studies or educational materials that involve the implementation of guidelines, surveys, or development of algorithms, etc.
- Consensus studies or results of a consensus meeting on definitions, terminology of complications, outcome criteria, and roles of nurse specialists in ostomy care.
- Experts' recommendations without evidence-based or consensus-based approaches.
- Commentary or review of published guideline(s), systematic review, or scoping review performed by nurses for evidence-based recommendations.
- Protocol or background information for an upcoming guideline.
- Not published in the full paper or not posted as a full guideline on the nursing organization website.
- Guidelines that have been updated and replaced by a newer version.
- Guidelines published in a language other than English.
- Duplicates.
- Guidelines published before 2010.

Data Extraction

Two reviewers acting independently extracted the following data from each guideline: Author, publication year, nursing guideline organization, country, number of recommendations or statements, and key topics covered by the recommendations. We also checked whether a literature search and a systematic review were conducted within the included sources, and if so, we noted the search databases and search dates. Additionally, we assessed whether the certainty or level of evidence was evaluated, and if so, we noted the methods used.

Evidence Synthesis

We reviewed each included guideline's recommendations or statements, summarizing the key topics into different categories, including preoperative, perioperative, postoperative, and post-discharge nursing interventions. We summarized the information descriptively and used a mapping table to present it. No statistical analysis was required.

To provide evidence to support the development of evidence-based patient care pathways, we focused on the recommendations related to the prevention, assessment, diagnosis, and management of parastomal (peristomal) hernias.

Quality Assessment

We assessed the quality of the evidence-based guidelines using the AGREE II tool,[13] with 3 reviewers (MH, YY, SR) independently evaluating each guideline. The tool includes 23 different items across 6 domains, each item rated on a 7-point scale (1: strongly disagree to 7: strongly agree), with each domain representing a distinct aspect of guideline quality. The AGREE II protocol does not include an overall score to recommend for or against using a specific guideline. Each domain score is calculated as the average score among the assessors, scaled to the total score of that domain (https://www.agreetrust.org). In general, guidelines are considered high quality if 5-6 domains score above 60%, average quality if 3-4 domains score above 60%, and poor quality if 1-2 domains score above 60%. Two supplementary items evaluate the global impression of each assessor: the overall quality assessment and whether the guideline would be recommended for use in clinical practice.

RESULTS

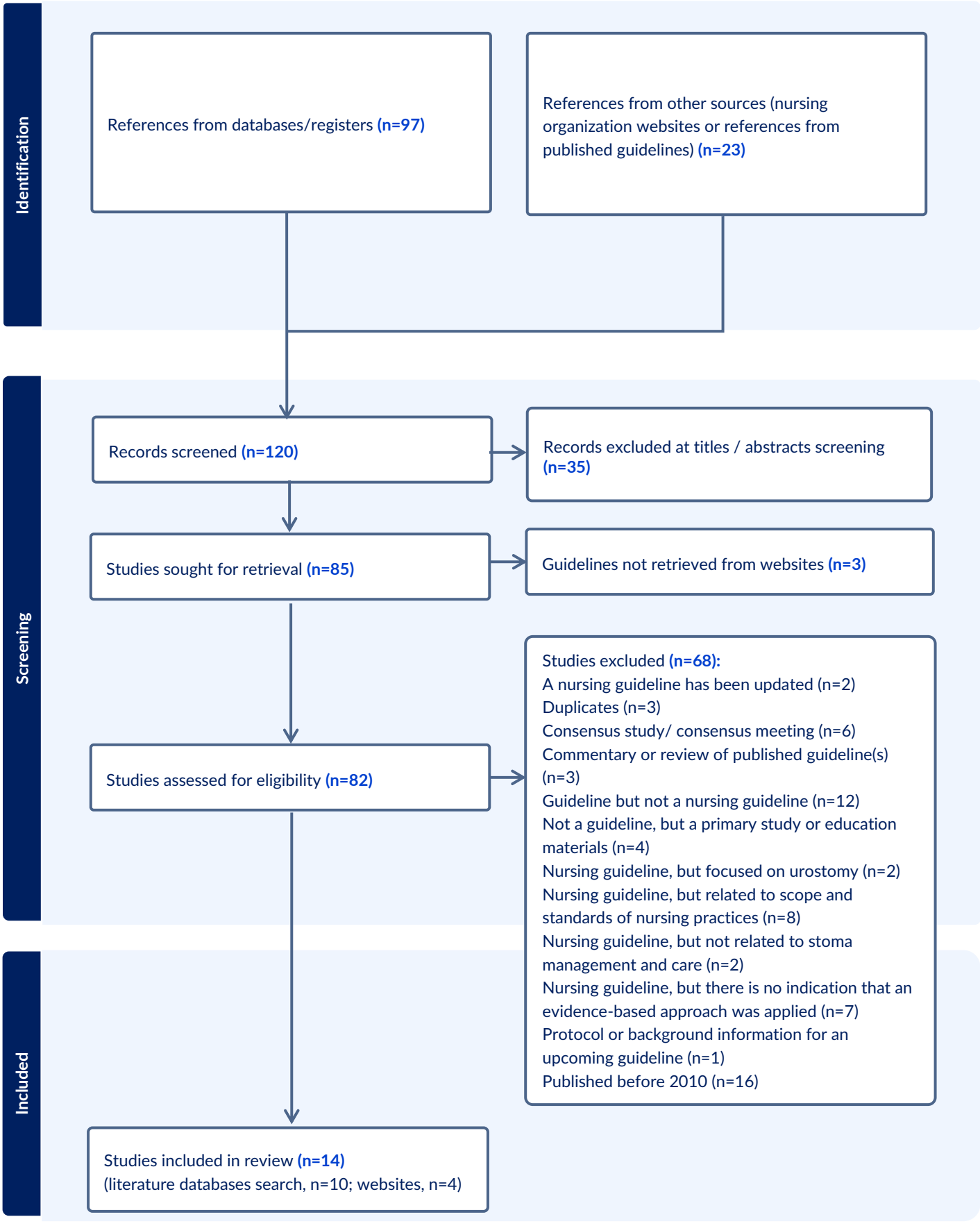
The database search yielded 97 references, while we identified an additional 23 documents on major nursing organization websites. We excluded 35 references at the titles and abstracts screening stage. Among 85 recorded, full texts of 3 documents were not retrieved from 2 nursing organization websites (World Council of Enterostomal Therapists 2020, 2014; Association of Coloproctology of Great Britain and Ireland 2017) and were excluded. We reviewed a total of 82 full-text documents and excluded 68 of them because they did not meet the inclusion criteria (Figure 2).

In total, 14 nursing guidelines met the inclusion criteria. Among these, we identified 10 guidelines from the literature search, [14-23] and 4 full guidelines [24-27] from the search of nursing organization websites (NSWOCC, RNAO, ASCN UK, AASTN). The 14 guidelines originated from Australia, Canada, Italy, the UK, the USA, and 3 international working groups, with publication dates ranging from 2013 to 2023 (Table 2).

The guidelines vary in scope; some focus on specific topics such as ostomy care in neonates, children, and adolescents; preoperative stoma site marking; use of convexity; peristomal skin health; parastomal hernia care; and enhanced recovery after surgery. Others provide comprehensive coverage of general ostomy care for patients anticipating or living with an ostomy. These guidelines offer recommendations for all stages of care, including preoperative, peri-operative, postoperative, and post-discharge phases (Table 2).

Key topics include referrals and access to ostomy care and other professionals; preoperative assessment and preparation; preoperative education and counselling; stoma site marking; postoperative assessment and evaluation; selection, teaching, use, and care of pouching products and accessories; ongoing education; documentation; discharge planning; post-discharge follow-up, assessment, and support; prevention, assessment, diagnosis, and management of parastomal (peristomal) hernias and other stomal and peristomal complications; ostomy care programs; daily living activities, exercises, and physiotherapy considerations; dietary and lifestyle guidance; sexual health; and quality

Figure 2: *Study Flow Diagram*



of life and psychological support (Table 2). There are no guidelines specific to patients with Crohn's disease and permanent ileostomies.

These guidelines vary in their terminology for recommendations, including "guidelines;" "statements;" "recommendations;" evidence-based "statements;" consensus-based "statements;" "consensus-based practice guidelines;" "steps" for marking; "assessment" tables, with the number ranging from 3 "assessment tables"[19] to 36 "statements" covering 17 questions in 9 categories.[22]

Quality Assessment

Three guidelines do not specify whether a literature search and review were conducted,[19,24,25] and the other 3 guidelines do not specify the search strategy or details of the searches.[15,26] Other guidelines report they searched varied databases with varied search dates. Three guidelines do not assess the level of certainty or quality of the evidence.[16,19,25] Six guidelines apply organization-specific evidence scales or numerical grading systems (e.g., Level 1-4, A-C), while only 3 use the GRADE approach.[18,21,27] Most recommendations are based on a low level of evidence, often relying on retrospective or observational studies and expert opinion. Two guidelines claim they are consensus-based due to a lack of supporting evidence.[15,17] (Table 3)

In the AGREE II assessment, only 2 guidelines were considered high quality[23,27] (mean overall scores >5). Most guidelines (n=8) were rated as average quality (mean overall scores ranging from 3.0 to 5.7). Four guidelines were assessed as poor quality (mean overall score ranged from 2.7 to 4.0), all published before 2020.[15,17,18,24] Finally, the assessors gave recommendation "yes" to the 2 high quality guidelines, "yes with modifications" to 7 average quality guidelines and 1 poor quality guideline, while a "no recommendations" was given to 1 overall average and 3 overall poor quality guidelines. All 14 guidelines obtained > 60% scores in Domain 1 (Scope and Purpose). Low percentage scores (< 60%) suggest that modifications are recommended. In particular, Domain 2 (Stakeholder Involvement) had 9 guidelines scoring below 60%, Domain 3 (Rigour of Development) had 8 guidelines scoring below 60%, and Domain 5 (Applicability) had 11 guidelines scoring below 60% (Table 4).

DISCUSSION

Nursing guidelines offer extensive coverage of ostomy care topics and provide valuable first-line care experience and consensus statements. Even though nursing ostomy guidelines are intended for nurses and stoma care nurses, they can aid other health care professionals as well, as all play a role in patient education. Although we reviewed guidelines generated by different organizations globally, we acknowledge that international standardization of ostomy care is not realistic due to significant differences in culture, access to care and products, reimbursement models, and other factors. Instead, increasing access to high quality guidelines can enhance the availability of evidence-based information in a format that is accessible to health care professionals. Our systematic review of nursing ostomy guidelines further confirms that stoma care nurses play a crucial role in the quality of ostomy care and patient outcomes. These nursing guidelines cover various topics. These first-hand recommendations are valuable for clinical practice and establish clinical care pathways for patients undergoing ostomy surgery. Although no guideline was specifically tailored to patients with CD and a PI, recommendations on preoperative, perioperative, postoperative, and post-discharge interventions remain relevant and can inform patient care pathways. We also assessed the quality of the nursing guidelines using the rigour of the AGREE II tool, with 2 guidelines[23,27] considered to be high quality, while the majority of the guidelines were considered to be average quality with valuable information.

After reviewing the published nursing guidelines, some gaps were identified that could be considered in future guidelines. When developing clinical pathways for those with PI because of CD, consideration along the continuum of life stages should be examined. Although not common, including those with a PI as the result of CD in the paediatric population[28] could be addressed. The paediatric person with an ostomy will eventually transition to the adult health care setting and understanding their past experiences and psychosocial development and adjustment to an ileostomy could assist in guiding needs and care.

Having a stoma has a major impact on daily life. As patients progress through various life stages, events, such as pregnancy, changes in relationships, or just changes in body contours and body image, can impact the physical, emotional, and psychological well-being of a person with an ostomy. Another area where patients face challenges is sexual health. This topic is discussed in guidelines, such as the RNAO 2019 guideline during preoperative and postoperative care.[27] Health care professionals are encouraged to address sexual health openly throughout follow-up care.

Incidence of a parastomal hernia with an end ileostomy is 1.8-28.3%.[26] This can have significant physical, psychological, and financial implications that affect overall quality of life.[26] A person with a PI may have initial care with a stoma care nurse and physiotherapist, but as the patient ages, they need on going support, both for prevention and care, if a parastomal hernia is present. As noted in the ASCN UK EXPASS recommendations, health care professionals do not feel confident or even educated enough to provide information on physical activity.[29] This is a gap in care, particularly for those with a permanent stoma. Those with CD are less likely to be active, especially with an ileostomy, which may increase the risk of a flare. Therefore, we hope to see this important topic included in more nursing guidelines.

Table 2: *Characteristics of the 14 Included Nursing Guidelines*

AUTHORS/ ORGANIZATION, YEAR	COUNTRY	NUMBER OF RECOMMENDATIONS/ STATEMENTS/ GUIDELINES	REFERRAL/ ACCESS TO OSTOMY NURSE OR OSTOMY EDUCATED HEALTH CARE PROFESSIONALS	PREOPERATIVE ASSESSMENT, EDUCATION/ COUNSELLING	PREOPERATIVE STOMA SITE MARKING	POSTOPERATIVE ASSESSMENT/ EDUCATION/ON GOING EDUCATION	POUCHING PRODUCTS & ACCESSORIES SELECTION/ TEACHING/ USE, & CARE
NSWOCC 2023[26]	Canada	15 recommendations	✓	✓	✓	✓	
Forest-Lalande 2023 /GPSNAB 2018[16]	International	13 guidelines for 24 topics		✓	✓	✓	✓
Zwiep 2022/CSCRS and NSWOCC 2020[23]	Canada	17 steps for stoma site marking	✓	✓	✓		
Perrin 2021/ASCN UK 2021[19]	UK	3 assessment tables		✓		✓	✓
Ratliff 2021/WOCN 2021[20]	USA	6 evidence-based statements and 19 consensus statements with content validation index					✓
Roveron 2021/ MISSTO 2021[21]	Italy	19 statements for preoperative preparation (n=2) and nursing care of stoma complications (n=17)		✓	✓		✓
Chabal 2021/WCET 2021[14]	International	15 recommendations covering the 4 key arenas of education, holistic aspects, and pre- and postoperative care	✓	✓	✓	✓	✓
RNAO 2019[27]	Canada	4 priority recommendation questions but covered multiple recommendations and PICOs	✓	✓	✓	✓	✓
Colwell 2019/ WOCN 2019[15]	International	7 consensus-based practice guidelines covered 3 major topics	✓	✓		✓	✓
WOCN 2018[22]	USA	36 statements covered 17 questions in 9 categories	✓	✓	✓	✓	✓
Miller 2017/The Ontario Provincial ERAS ETN 2017[18]	Canada	11 recommendations: preoperative care (n=2), post-operative care (n=5), post-discharge care (n=4)	✓	✓	✓	✓	
ASCN UK 2016[25]	UK	14 statements	✓		✓		✓
AASTN 2013[24]	Australia	8 guidelines	✓	✓			✓
Gray 2013/WOCN[17]	USA	9 consensus-based statements				✓	✓

Abbreviations: ASCN—Association of Stoma Care Nurses UK; AASTN—Australian Association of Stomal Therapy Nurses; CSCRS—Canadian Society of Colon and Rectal Surgeons; ERAS—Enhanced Recovery After Surgery; ETN—Enterostomal Therapy Network; GPSNAB—Global Paediatric Stoma Nurses Advisory Board; MISSTO—Multidisciplinary Italian Study Group for STOmas; NSWOCC—Nurses Specialized in Wound, Ostomy and Continence Canada; RNAO—Registered Nurses' Association of Ontario; WCET—World Council of Enterostomal Therapists; WOCN—Wound, Ostomy, and Continence Nurses Society

DOCUMENTATION/ VALIDATED ASSESSMENT TOOL USAGE	OSTOMY CARE PROGRAM (AN ORGANIZATION-LEVEL APPROACH)	DISCHARGE PLANNING	POST-DISCHARGE FOLLOW-UP / ONGOING ASSESSMENT/ SUPPORT	PARASTOMAL (PERISTOMAL) HERNIA (PH) PREVENTION, ASSESSMENT, DIAGNOSIS & MANAGEMENT	DIAGNOSIS, PREVENTION & MANAGEMENT OF OTHER (NOT PH) STOMAL & PERISTOMAL COMPLICATIONS	ACTIVITIES OF DAILY LIVING/ EXERCISES/ PHYSIOTHERAPIST CONSIDERATIONS	DIET/ REGISTERED DIETITIAN/ LIFESTYLE CONSIDERATIONS	QUALITY OF LIFE/ PSYCHOLOGIC CONSIDERATIONS/SOCIAL DETERMINANTS OF HEALTH/ SEXUAL HEALTH
✓			✓	✓		✓		✓
	✓		✓	✓	✓	✓		✓
✓	✓		✓					
			✓					
					✓	✓	✓	✓
				✓	✓			
				✓	✓			
✓	✓	✓	✓	✓	✓	✓	✓	✓
✓			✓		✓			✓
			✓	✓	✓			✓
	✓	✓	✓					
		✓		✓		✓		
				✓	✓			
✓			✓		✓	✓	✓	✓

Table 3: *Other Covered Content, Literature Searches, and Level of Certainty Assessment of the Included Nursing Guidelines*

AUTHORS/ ORGANIZATION, YEAR	COUNTRY	OTHER COVERED CONTENT
NSWOCC 2023[26]	Canada	Further research is required to gain a greater understanding of the risk factors associated with, prevention of, and management strategies for parastomal hernias.
Forest-Lalande 2023/ GPSNAB 2018[16]	International	1. Common pathologies and indications for a stoma in neonates and children. 2. How to develop a therapeutic relationship with the child and family according to age and developmental phase. 3. Types of ostomies observed in paediatrics 4.Premature neonates, neonates, and children's skin characteristics.
Zwiep 2022/ CSCRS and NSWOCC 2020[23]	Canada	Describes ERAS program that includes postoperative recommendations. Mentions but does not go into possible stoma complications and QoL considerations.
Perrin 2021/ASCN UK 2021[19]	UK	NA
Ratliff 2021/ WOCN 2021[20]	USA	Consensus statements included: nonmodifiable and modifiable associated factors, fluid/ diet/ lifestyle; discusses skin health which is part of assessment, however, does not specify when (would have to assume with any assessment postoperatively; either in hospital or on going). Showering/bathing considered a part of ADLs.
Roveron 2021/ MISSTO 2021[21]	Italy	Describes ERAS program that includes postoperative recommendations. Mentions but does not go into possible stoma complications and QoL considerations.
Chabal 2021/ WCET 2021[14]	International	Holistic approach to care (a holistic assessment of the person/family to guide co-participatory care). "Education and scope of practice" statements (specialised training, maintain knowledge, skill, and competency, practice parameters according to legal framework).
RNAO 2019[27]	Canada	Other RNAO guidelines and resources mentioned (Appendix B): "client centred learning, culturally sensitive care, implementation science, implementation frameworks, interprofessional collaboration, person- and family-centred care, self-management of chronic conditions, therapeutic relationships."
Colwell 2019/ WOCN 2019[15]	International	NA
WOCN 2018[22]	USA	NA
Miller 2017/The Ontario Provincial ERAS ETN 2017[18]	Canada	Supporting rods are usually unnecessary. If used, timing for removal of the supporting rod should be decided in collaboration with the surgeon. Families and caregivers should be encouraged to participate in the care and management of the patient's ostomy
ASCN UK 2016[25]	UK	NA
AASTN 2013[24]	Australia	Ileal Conduit/Urostomy: urine specimen from conduit; removal of ureteric stents from a urostomy; nephrostomy tube care; percutaneous endoscopic gastrostomy (PEG).
Gray 2013/ WOCN[17]	USA	NA

Abbreviations: ASCN—UK Association of Stoma Care Nurses United Kingdom; AASTN—Australian Association of Stomal Therapy Nursing; CSCRS—Canadian Society of Colon and Rectal Surgeons; ERAS—Enhanced Recovery After Surgery; ETN—Enterostomal Therapy Network; GPSNAB—Global Paediatric Stoma Nurses Advisory Board; MISSTO—Multidisciplinary Italian Study Group for STOmas; NSWOCC—Nurses Specialized in Wound, Ostomy and Continence Canada; RNAO—Registered Nurses' Association of Ontario; WCET—World Council of Enterostomal Therapists; WOCN—Wound, Ostomy, and Continence Nurses Society Note In column "Literature search and systematic reviews were performed/search databases and date":

LITERATURE SEARCH AND SYSTEMATIC REVIEWS WERE PERFORMED/SEARCH DATABASES AND DATE	LEVEL OF CERTAINTY/QUALITY OF CERTAINTY/LEVEL OF EVIDENCE
"Parastomal Hernia Reviews in the Cochrane Database of Systematic Reviews"	Used RNAO's Level of Interpretation of Evidence (2017 Ref). Ia-V
"Comprehensive of PubMed and CINAHL electronic databases and the Google Scholar" until August 2018	"based on clinical evidence when available and on consensus-based best practices when evidence supporting care was not available"
January 2009 to April 2019: MEDLINE, Embase, Cochrane, PubMed, CINAHL and Google Scholar	Limited: "the quality of evidence used to guide the steps involved in stoma site selection. Much of the literature on stoma site marking is retrospective, observational or based on expert opinion", "Given that little high quality evidence exists on the individual steps for stoma site marking or placement, most guidelines, including the present document, are based on expert opinion."
No mentioned literature search	Mentioned "evidence-based guideline", "As previously stated, there is a paucity of research on convexity, so it is not possible to provide robust research-based evidence for the assessment and decision-making processes necessary to help decide whether or not a convex appliance is appropriate for a patient." The guideline does not compensate for the lack of research-based evidence required to support its ongoing use. The ASCN UK acknowledges the need for further work and hopes to undertake more detailed work in future
Performed a scoping review. Searched CINAHL, PubMed, and Embase to find literature related to peristomal skin health, from Jan 1980 to "current year." (2020?)	6 evidence-based statements, with level of evidence as A, B, C, using a 3-point ordinal scale adapted from a taxonomy for statements for recommendations for treatment statements disseminated by the American Academy of Family Physicians and regularly used by the WOCN Society to generate similar scholarly documents. 19 consensus statements with content validation index.
Based on "a scoping review of the literature," updated search on March 31, 2018, performed in PubMed, national guideline clearing house, CINAHL, and the international and national databases: Cochrane CDSR, SIGN, NICE, JBI, RNAO, WOCN, BSG, AASTN, ACGBI, ASCRS, CAET, ERAS, EAUN, and WCET.	"All the studies were evaluated according to the GRADE system and AGREE II tool" (should assess evidence not studies).
A search of the literature published in English from May 2013 to December 2019 by the authors of this article, who comprise the guideline development panel. More than 340 articles were reviewed.	The strength of recommendations was rated using an alphabetical system (A+, A, A−, etc.), SOE (strength of evidence) provided for each statement.
Guideline search + gap analysis, + scoping review for pediatric population- Figure 4, 6 guidelines were reviewed by searching "through website" (no details), 3 excluded and 3 scored <3 using AGREE II.	Used GRADE for quantitative research, used GRADE-CERQual methods for qualitative research.
Literature review, list of keywords searched, 77 articles were included. No databases or search date.	Modified Delphi research methodology to reach international consensus on assessment of peristomal body profiles.
Literature search utilized EBSCO Discovery Service, published from 2009 to 2015, 126 papers were included.	Level of evidence, Level I to VI, level-of-evidence rating for strength of guideline recommendations: A, B, C, and task force consensus. Assessment of benefit/effectiveness versus harm of recommendations: Class I-IV, from WOCN 2017.
Literature search conducted using MEDLINE and CINAHL databases encompassing the years 2004-2014, performed SRs for statements 1.1 and 2.2.	GRADE assessment: Level of evidence, very low, low, moderate, and high.
Only mentioned "these evidence-based clinical guidelines" and "peer-reviewed"; mentioned "based on current evidence", but not many details.	"Each guideline has been written utilising the same format as the Stoma Care Standards, the National Institute of Clinical Evidence (NICE) structure, process and outcome framework, to describe a level of excellence in care delivery and a measure against which practice may be audited."
Did not mention literature search.	Level of evidence: 1a, 1b, 11a, 11b, 111, 1V. Mentioned "Research into stomal therapy nursing practice to-date is limited. Current practices are primarily guided by case series or expert opinion (Level 1V) resulting in little documented evidence of best practice from the higher research levels generally accepted as evidence," did not assign a level of evidence to any guideline statements.
MEDLINE and CINAHL electronic databases after 1990-2012; 239 articles included 35 original research reports and 204 integrative or systematic review articles, individual case studies, and multiple case series	"Consensus-based statements outlining best practices for the assessment, prevention, and management of peristomal moisture-associated dermatitis among patients with fecal ostomies."No studies were identified that specifically evaluated treatment or prevention of peristomal MASD.

Green indicates that these guidelines performed a proper literature search and systematic review. Blue indicates that these guidelines did not specify the search strategy or details of the searches.Grey indicates that these guidelines did not specify whether a literature search and review were conducted. In column "Level of certainty/quality of certainty/level of evidence": Green indicates that the GRADE approach was used to assess the level of certainty of evidence. Blue indicates that these guidelines applied organization-specific evidence, scales or numerical grading systems Grey indicates that no level of certainty was assessed. White indicates these guidelines were consensus-based due to a lack of supporting evidence.

Table 4: *AGREE II Assessment of Included Guidelines*

AGREE II DOMAINS	NSWOC 2023[26]	FOREST-LALANDE 2023/GPSNAB 2018[16]	ZWIEP 2022/ CSCRS AND NSWOCC 202023	PERRIN 2021/ASCN UK 2021[19]	RATLIFF 2021/ WOCN 2021[20]	ROVERON 2021/ MISSTO 2021[21]
Domain 1	91%	95%	83%	94%	83%	93%
Domain 2	54%	61%	80%	43%	46%	80%
Domain 3	65%	51%	80%	31%	63%	48%
Domain 4	85%	70%	85%	74%	72%	82%
Domain 5	29%	18%	72%	15%	29%	40%
Domain 6	64%	82%	78%	85%	78%	56%
Overall based on the number of domains>60%	Average	Average	High	Average	Average	Average
Overall, by assessors (range from 1 to7)	5.0	4.3	5.7	4.0	4.7	4.3
Recommendation by assessors	Yes, with modifications	Yes, with modifications	Yes	Yes, with modifications	Yes, with modifications	Yes, with modifications

Domain 1—Scope and Purpose; Domain 2—Stakeholder Involvement; Domain 3—Rigour of Development; Domain 4—Clarity of Presentation; Domain 5 – Applicability; Domain 6—Editorial Independence. Overall Guideline Assessment included 2 questions: 1. Rate the overall quality of this guideline. Scoring: 1(Least Quality) - 7(Highest Quality).2. I would recommend this guideline for use. Scoring: "Yes", "Yes, with modifications", "No". Abbreviations: ASCN—UK Association of Stoma Care Nurses United Kingdom; AAS-TN—Australian Association of Stomal Therapy Nursing; CSCRS—Canadian Society of Colon and Rectal Surgeons; ERAS—Enhanced Recovery After Surgery; ETN—Enterostomal

As stated in the RNAO 2019 guideline, "Persons living with an ostomy have the right to comprehensive, personalized, and accessible care"[27] as stated in the Charter of Ostomates Rights. When considering pathways and guidelines moving forward, accessing care can take different forms, including in-person clinic-based care and telehealth. Ostomy care is an intimate form of health care; therefore, the in-person therapeutic relationships built between health care professionals and patients are very important. Web-based technology can have advantages,[14] such as assisting those requiring faster consultations when complications with pouching systems or peristomal skin concerns occur or for those who do not have access to a stoma care nurse in their geographical area. Regular, yearly follow-up by a stoma care nurse is suggested.[27] This can be a challenge if organizations do not support ongoing follow-up; therefore, telehealth could potentially make this more feasible.[30]

This systematic review has several strengths. First, our knowledgeable review team included nurses, an experienced ostomy nurse, IBD specialists, and researchers. We not only summarized what was reported; we also proposed possible knowledge gaps. We searched not only published guidelines but also websites of nursing organizations and included and assessed 14 international nursing guidelines related to ostomy. The 2 previously published systematic reviews on this topic included only 5 ostomy clinical practice guidelines[10] and 10 ostomy clinical practice guidelines.[11] These did not focus on nursing, with only 3 (published from 2017-2019) and 5 (published from 2017 to 2021) nursing guidelines. These identified ostomy nursing guidelines were included in our review. They also included procedural or surgical ostomy interventions and enterocutaneous fistula recommendations. All 3 systematic reviews showed the RNAO 2019 guideline receiving the highest AGREE II score.

We acknowledge that this review also has some limitations. The search was limited to the English language. Three documents were not retrievable from the organizations' websites; therefore, we were not able to assess their eligibility, although we included newer guidelines from the same organization (WCET) or the same country (UK). Most published guidelines do not present all the information due to the space limits of the journals. Therefore, AGREE II scoring might not be accurate when based on the publication summaries for these guidelines. Some of the guidelines reviewed were not necessarily intended to be clinical practice guidelines but were based on consensus statements, practice standards, or best practice recommendations. We could only summarize what was reported, as terminology varied from "guidelines, practice guidelines, good practice guidelines, recommendations, statements, steps, topics, assessments, etc." All are intended to improve patient care, but standardizing terminology and the methodological approach can only enhance patient care, improve international collaboration, and enhance the rep-

CHABAL 2021/ WCET 2021[14]	RNAO 2019[27]	COLWELL 2019/ WOCN 2019[15]	WOCN 2018[22]	MILLER 2017/THE ONTARIO PROVINCIAL ERAS ETN 2017[18]	ASCN UK 2016[25]	AASTN 2013[24]	GRAY 2013/ WOCN[17]
67%	100%	82%	94%	70%	80%	80%	74%
50%	96%	57%	56%	56%	57%	35%	43%
49%	93%	42%	65%	35%	27%	13%	65%
74%	96%	70%	78%	43%	72%	65%	57%
65%	85%	26%	17%	10%	22%	29%	29%
83%	89%	29%	69%	50%	0%	14%	19%
Average	High	Poor	Average	Poor	Average	Poor	Poor
4.7	6.0	4.0	5.0	3.3	3.0	2.7	3.0
Yes, with modifications	Yes	Yes, with modifications	Yes, with modifications	No	No	No	No

Therapy Network; GPSNAB—Global Paediatric Stoma Nurses Advisory Board; MISSTO Multidisciplinary Italian Study Group for STOmas; NSWOCC—Nurses Specialized in Wound, Ostomy and Continence Canada; RNAO—Registered Nurses' Association of Ontario; WCET World Council of Enterostomal Therapists; WOCN Wound, Ostomy, and Continence Nurses Society Note Green indicates these domains obtained >60% scores. Blue indicates these guidelines were assessed as overall high quality and were recommended by assessors.

utation and credibility of the collaborating organizations.[31] As such, only 2 of the 14 guidelines reviewed achieved a high overall quality of assessment.[23,27] However, as the first systematic review focusing on ostomy nursing guidelines, we believe our review provides insights on this topic. Finally, we did not review data related to the urostomy. We suggest that a similar review focused on the urostomy would be valuable for future research.

CONCLUSION

This first systematic review and quality assessment of clinical practice nursing guidelines for ostomy care highlights both strengths and areas to improve and expand within current guidelines.

Nursing guidelines offer extensive coverage of ostomy care topics and provide valuable first-line care experience and consensus statements, particularly for postoperative stoma and peristomal care. These insights are essential for non-nursing health care providers and contribute to the development of patient care pathways for individuals with Crohn's disease and permanent ileostomies. However, the limited availability of high quality evidence underscores the need for further research in ostomy care. Involving ostomy nurses in clinical research design and execution is crucial for both advancing the quality of evidence and enhancing future guideline updates in ostomy care. •

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