A RESOURCE FOR THE PREVENTION AND MANAGEMENT OF INCONTINENCE-ASSOCIATED DERMATITIS

by © Stephanie Buffett BNRN

A report submitted to the School of Graduate Studies in partial fulfillment of

the requirements for the degree of

Master of Nursing

Faculty of Nursing

Memorial University of Newfoundland

June 2023

St. John’s Newfoundland and Labrador

Abstract

Background: Incontinence-associated dermatitis (IAD) is skin damage that occurs from repeated exposure to urine and/or feces. Research has shown that this condition can have significant implications for clients and the healthcare system (Beeckman, 2016). Informal discussions with a wound care consultant identified that the Central Health Authority in Newfoundland and Labrador does not have a dedicated educational resource for nursing staff related to the prevention and management of IAD. **Purpose:** To develop a resource for all nursing staff to help with the prevention and management of IAD across all settings of Central Health. **Methods:** A literature review was conducted to: determine if evidence existed to support the need for an IAD resource to inform nursing staff; determine the level of knowledge nurses have related to IAD; identify content for the resource, such as risk factors, IAD implications and best practice guidelines around IAD; and examine effective methods for knowledge mobilization to nursing staff. An environmental scan was conducted to identify existing educational resources related to IAD across the country. Finally, consultations included surveying nursing staff who provide direct client care in the long-term care and acute care settings and interviewing wound care consultants within Central Health. **Results:** The evidence supported the need for an educational resource related to IAD knowledge for nursing staff. Findings from the environmental scan and consultations informed the content and method of delivery of the IAD resource developed for the project. A comprehensive toolkit was developed to assist in meeting the identified educational needs of nursing staff when caring for clients who are at risk for or have developed IAD. **Conclusion:** The creation of the toolkit is expected to enhance the knowledge of nursing staff regarding IAD. With the eventual implementation of the toolkit, it is expected that there will be improved care client outcomes related to IAD.

Keywords: incontinence-associated dermatitis (IAD), toolkit, nursing staff, education, resource.

Acknowledgements

I would like to thank my supervisor, Ms. Erica Hurley PhD (c), RN, CCNE for her guidance and support throughout the process of completing this practicum project.

To Nicole Pitcher, MCISc-WH, BScN, RN, NSWOC, thank you for your expert knowledge and unwavering support. I could not have made this happen without you.

To my parents, Wanda and Charles, I am blessed to have had such support and encouragement throughout this process. Thank you for all of the love and help along the way.

And finally, to my daughters Rory and Macy, thank you for being my light, my motivation and my reason for always trying my hardest.

Table of Contents

Introduction

Impaired skin integrity is a common concern for health care providers in all client care areas because it can have significant implications on both the health of clients as well as the healthcare system. Incontinence-associated dermatitis (IAD) can be defined as impaired skin integrity in the areas of the buttock and perineum that develops from repeated exposure to urine and/or feces and is marked by redness, inflammation, lesions, and pain (Lin et al., 2015). Contributory factors for the development of IAD include multiple client characteristics: such as limited mobility, low Braden scores and environmental factors. Contributing environmental factors for IAD include friction, skin tearing, and skin cleansing procedures which are often associated with nursing and caregiver behaviours (Lin et al., 2015).

Occurrences of IAD have been identified across all care settings, including acute, critical, long-term care, and community settings. In a 2019 study, researchers examined the prevalence of IAD across multiple care areas in Canada and the United States. The researchers determined that of people who experience incontinence, one in five developed some degree of IAD (Kayser et al., 2019). However, Cocoran and Woodward (2013) note that this number is likely much higher, as IAD often goes unrecognized and misdiagnosed, thus under reported. Misdiagnosis of IAD can lead to delays and errors in treatment and may contribute to the development of more serious complications including open wounds, systemic infection, and in severe cases, death. Nurses should be knowledgeable of prevention, diagnostic, and treatment strategies for this condition as they are essential in achieving optimal outcomes for clients. Additionally, nursing staff can be champions and utilize this knowledge to educate clients, families, and caregivers to take on an active role in the prevention and treatment of IAD. Therefore, it is critical for nursing staff to have access to educational resources about IAD that clearly presents information and provides guidance for care and decision making.

At Central Health, there is currently no existing educational resource to aid nursing staff in the proper assessment, diagnosis, or treatment for IAD. I initially identified this gap through informal discussions with one of Central Health's wound care consultants. Based on her recognition of the prevalence of IAD and her brief scan of existing resources, we decided that Central Health's nursing staff, including personal care attendants (PCAs), licensed practical nurses (LPNs), and registered nurses (RNs), could benefit from a resource focused on the prevention and treatment of IAD. Therefore, I conducted a literature review, environmental scan, and consultations with key stakeholders to guide the development of an educational resource focused on IAD that can be utilized in any client care area. I have utilized Knowles' (1978) theory of adult learning to support the development of a resource that would be effective in engaging adult learners. Specifically, I used the theory to guide the methods conducted for the resource development to ensure the methods are aligned with the theory's principles that adult learners prefer to be independent and self-directed, that they require awareness of the relevance of the educational topic matter, and that their learning is optimized when it is conducted using multiple strategies (Knowles, 1978). Therefore, I conducted a literature review, environmental scan, and consultations with key stakeholders to guide the development of an educational resource focused on IAD, a topic relevant to nursing staff, that is multi-dimensional and can be utilized in any care setting. It is believed that by filling this knowledge gap through the creation of this resource, that outcomes can be improved for clients in all care settings.

Goal and Objectives

The overall goal of the practicum was to develop an educational resource for nursing staffing for the prevention and management of IAD across all settings of Central Health.

The key practicum objectives are:

1. Determine the need for resource development for nursing staff at Central Health related to the prevention and management of IAD;
2. Identify best practice guidelines for the prevention and management of IAD;
3. Identify strategies to mobilize knowledge and impact nursing practice related to IAD prevention and management;
4. Develop a resource for the prevention and management of IAD;
5. Demonstrate advanced nursing practice competencies, including leadership, consultation and collaboration, and research.

Overview of Methods

This practicum project was completed using three distinct methods. First, I conducted an integrated literature review to: (a) determine if evidence existed to support the need for an IAD resource, (b) identify content for the resource, and (c) determine effective ways to mobilize this information to nursing staff. Next, I conducted an environmental scan to identify existing IAD resources for nursing staff across Newfoundland and Labrador and Canada. I did this by contacting wound care consultants from the province's health authorities and through an extensive internet search. Lastly, consultations were conducted with identified key stakeholders of the project. Consultations were completed in two ways, by distributing hard copy surveys to nursing staff within Central Health in Newfoundland and Labrador who provide direct client care in the acute and long-term care settings, and by conducting semi-structured interviews with wound care consultants within the health authority.

Summary of the Literature Review

The integrative review was conducted using the databases PubMed and CINAHL, through the Memorial University of Newfoundland and Labrador library website. Key search terms included "nurs*", "incontinence-associated dermatitis", “IAD”, "prevention", "management", "education", and "resource". The search filter was set to display English articles only. Publication dates were narrowed to 2012 – 2022. The titles of the articles were first skimmed for relevance and then abstracts were read. Articles that appeared relevant were then read in detail. I conducted an additional search using Google Scholar in the same manner. Other strategies included conducting an online search through Cochrane library and Joanna Briggs Institute, using similar parameters as above. Grey literature published by wound care associations and other organizations within Newfoundland and Labrador and Canada were reviewed. The search conducted for this literature review yielded 25 research articles and one publication authored by a national wound care organization.

Knowles’ (1978) adult learning theory guided aspects of the literature review. Specifically, Knowles’ theory supported the examination of multiple methods of education delivery, including those that utilized a self-directed approach as adults are generally independent learners. Knowles’ theory also suggests that in order for adult learners to be actively engaged in their learning process they must be aware of the relevance of the material. Therefore, the implications of IAD were examined in the literature so that staff would understand why the topic of IAD prevention and management is relevant to their practice. Additionally, all research articles appraised were specifically focused on nursing staff, thus maintaining relevance to the project being developed.

Implications

The evidence from the literature review revealed that IAD can have profound implications for both the client and the health care system. IAD can lead to serious complications if not treated properly including the development of pressure injuries (PI) (Yates, 2020) and/or bacterial and fungal infections (Conley et al., 2014; Ferrerira et al., 2020). Therefore, IAD can contribute to longer hospital stays for clients and frequent readmissions, creating higher healthcare costs and placing a strain on the flow of clients through the healthcare system (Kayser et al., 2021; Wassel et al., 2020). It is concluded that if nursing staff are knowledgeable about IAD prevention and management, it may reduce the prevalence of IAD and its complications. Knowles' (1978) theory of adult learning suggests that for education to be effective for adult learners the topic must be relevant to their professional or personal lives and that they must understand the reason why it is important to them to learn the information. Therefore, utilizing Knowles' principles the topic of implications was supported for inclusion in the resource for nursing staff as it may help nursing staff better understand the importance of providing proper care to clients who are incontinent.

Nursing Staff's Knowledge Level of IAD

Nursing staff's knowledge level related to IAD, specifically in the areas of definition/etiology, diagnosis, and prevention and treatment strategies was examined in four studies retrieved in this literature review. Three studies concluded that nursing staff have a low level of knowledge in the areas of IAD diagnosis (Alcoforado et al., 2019; Barakat-Johnson et al., 2022; Sahin et al., 2019), while three studies determined that nurses' knowledge of IAD is low in the area of prevention and treatment measures (Barakat-Johnson et al., 2022; Sahin et al., 2019; Strehlow et al., 2018). This supported that IAD knowledge from the areas of diagnosis and

prevention and treatment be incorporated as content in the resource developed. Furthermore, the level of knowledge nursing staff had related to the definition/etiology of IAD was conflicting in the literature. Alcoforado et al. (2019) and Barakat-Johnson et al. (2022) concluded that nurses had satisfactory knowledge of IAD definition. However, a study by Sahin et al. (2019) determined that nurses had a much lower level of IAD knowledge related to the definition/etiology as participants earned subpar scores on their knowledge assessments in this area (Sahin et al., 2019). Although the evidence from the findings were conflicting, there was indication that the inclusion of a definition of IAD and its etiology in the educational resource for nursing staff would be beneficial.

Risk Factors for IAD

Upon review of the literature, it was evident that identifiable risk factors for IAD were key components of IAD within the health care system. Specifically, the risk factors of obesity, friction/shear issues, limited mobility, and frequency of incontinence care were commonly identified in the literature. Three studies specifically identified data that supported the belief that when clients are incontinent and are obese their likelihood of developing IAD is significantly increased (Ferreria et al., 2020; Kaysar et al., 2019; Kottner & Surber., 2016). Secondly, I identified five studies that indicated that limited or impaired mobility is a significant risk factor for the development of IAD (Gray & Giuliano, 2018; Johansen et al., 2018; Kaysar et al., 2019; Kaysar et al., 2021; Kottner & Surber, 2016). Similarly, Ferreira et al. (2020) determined that if a client's level of dependence for care was high, they were significantly more likely to develop an occurrence of IAD. Evidence from three studies also suggested that there is also an association between the development of IAD from exposure to friction and shear from linen and other surfaces (Kaysar et al., 2019; Kottner & Surber, 2016; Van Damme, et al., 2017). Moreover,

Kaysar et al. (2019) found that each additional layer of linen placed on a client's bed increased their likelihood of developing IAD symptoms by 8.3%. Lastly, the authors Conley et al. (2014) and Phipps et al. (2019) found that when the length of time increases between when clients are incontinent and when they receive personal care such as incontinence pad changing, they are more likely to develop signs of IAD or worsening of present symptoms Therefore, the findings from the literature supports the belief that the frequency that personal care is provided to incontinent clients can have a significant impact on the development of IAD symptoms.

The literature provided evidence that if nursing staff are knowledgeable about the contributing factors for IAD development they would be capable of recognizing clients at risk for the condition and could implement prevention measures early in their plans of care. Therefore, the risk factors for IAD identified from the literature review were considered for use as content in the educational resource for nursing staff if the environmental scan and consultations would be in support of this.

Best Practice Guidelines

To determine if best practice guidelines are supported in the literature as a beneficial approach to the care of clients with IAD a literature review was conducted. It was suggested by the key contact of this project that I review grey literature from national wound care organizations who recommend care guidelines related to IAD. A publication by the wound care organization, Wounds Canada, was identified through the literature review that utilized current best practice evidence to recommend standard, comprehensive skin care guidelines that must be implemented for at risk clients to prevent and treat IAD (Leblanc et al., 2020). Wounds Canada recommends that a consistent approach to skin care be taken by all healthcare staff who provide direct client care and involves the use of such products as disposable cloths, gentle, no-rinse

cleansers, moisturizer, and barrier film or cream to prevent and treat occurrences of IAD (Leblanc et al., 2020). A review of the literature identified three quantitative studies that examined similar standard comprehensive care guidelines used to prevent and treat IAD that also utilized gentle cleansers, skin protectant, barrier cream, and disposable wipes (Glass et al., 2020; Kon et al., 2017; Zhang et al., 2022). While guidelines varied slightly in each study, it was evident that a consistent and standard approach to care was effective for promoting positive outcomes for clients who were incontinent. Specifically, two of these studies concluded that their standardized guidelines were effective in reducing the incidence of IAD development (Kon et al., 2017; Zhang et al., 2022), one determined it was effective in delaying the development of IAD (Zhang et al., 2022), and one study concluded their approach to care was effective in reducing skin loss due to deterioration with a higher likelihood of healing occurrences of IAD (Glass et al., 2020).

This evidence revealed that a comprehensive regimen using products such as no-rinse cleansers, moisturizers, barrier creams, and film barriers are effective in reducing prevalence and severity of IAD. Therefore, it was decided that a standard, comprehensive approach to care using the aforementioned products would be included as content in the resource if the environmental scan and consultations also supported these findings.

Method of Delivery

The literature was reviewed to examine the effectiveness of various methods of delivery that could be used for knowledge translation to nursing staff related to IAD or PI. Knowles (1978) proposed that adults prefer to be independent and self-directed in their learning experiences, thus supporting the examination of electronic learning methods that encouraged independent learning. Three studies in the literature review evaluated methods of IAD education

for nurses and other healthcare professionals that were primarily electronic in nature and involved interactive online learning modules or posting content online for staff to read. Each of these three studies determined that their interventions were effective for knowledge translation for nursing staff related to IAD or PI outcomes (Bates & Ercolano,2021; Bredson et al., 2016; del Cotillo-Fuente et al., 2021). Specifically, del Cotillo-Funete et al. (2021) determined that the percentage of patients at risk of developing IAD that were receiving appropriate prevention measures significantly increased after their educational intervention and that these measures were effective since the length of time between the first episode of incontinence and the onset of IAD doubled after the electronic learning education. Another positive outcome was identified in the study by Bates and Ercolano (2021) in that nurses who had taken part in the electronic education of IAD were noted to have an increase in the percentage of patients with IAD who received proper treatment measures, with percentages nearly doubling after implementation of the education.

Traditional in-person educational strategies were also examined in the literature review. Five studies were appraised that evaluated the effectiveness of an in-person educational session for healthcare professionals related to IAD and PI. Two studies used a single face-to-face classroom presentation to deliver content related to differentiating between IAD and PI and classifying occurrence of each (Beeckman et al., 2010; Lee & Kim, 2016). One study conducted a full day in-person training for nurses related to PI prevention (Sving et al., 2017) and two studies held multiple in-person sessions on multiple days to deliver their educational material regarding IAD and PI (Gates et al., 2019; Ursavas & Iseri, 2020). Each of these studies were found to have significant results in that they determined that the level of knowledge nurses had related to IAD or PI were increased after completing the in-person educational sessions

(Beeckman et al., 2010; Gates et al., 2019; Lee & Kim, 2016; Sving et al., 2017; Ursavas & Iseri, 2020). It was concluded that in-person learning may be effective in translating IAD knowledge to nursing staff, thus this method was considered for the resource developed if findings from subsequent project methods would support it.

A common finding identified from examining in-person educational strategies was that the inclusion of visual aids was effective for learning. Three studies included visual aids such as photographs and/or videos of normal skin, IAD classes, and PI classes in their education sessions to assist with nurses' differentiation, diagnosing, and classification of IAD and PI (Beeckman et al., 2010; Gates et al., 2019; Lee & Kim., 2016). The conclusions drawn from all three studies were that the use of visual depictions was effective in increasing nurses' diagnostic abilities related to IAD and PI as testing scores were higher after the education sessions than before. In fact, once study found that the cases of IAD correctly identified on admission to the units included in the study, rose from 1% to 24% indicating nurses' identification and diagnostic skill had improved after the education session (Gates et al., 2019). Therefore, this evidence suggested that visual aids are effective in knowledge translation for nurses related to IAD education.

Knowles' (1978) theory supports the use of multiple educational strategies to best meet the needs of adult learners. Therefore, applying adult learner principles along with the literature review findings it became apparent that the resource developed should include multiple learning strategies. Electronic and in-person learning were both found to be effective methods to mobilize IAD knowledge to nursing staff within the literature. These two types of educational delivery strategies along with the use of visual aids were further explored in the environmental scan and consultation phases of the project.

Summary of Environmental Scan and Consultations

Environmental Scan

The environmental scan was completed in two distinct parts. First, I made contact with wound care consultants within the province's other three regional health authorities to identify existing resources related to IAD being utilized to educate nursing staff in Newfoundland and Labrador. Five consultants in total were contacted from the Eastern Health, Western Health, and Labrador Grenfell Health authorities and four agreed to participate. Wound care consultants were contacted by email with telephone follow-up. Through my consultations with the wound care consultants I discovered that very few resources focused primarily on IAD; instead IAD was often only a small portion of a larger resource. An example of one of these resources was an in-person learning session on PI prevention where IAD was discussed as a section of the presentation content. A total of seven relevant resources were retrieved for examination and analysis from the consultations with the wound care consultants. These educational strategies that incorporated relevant content on IAD included written material that was available through an electronic source such as the internet or a learning management system, online learning modules, hardcopy wound care pocket booklet, in-person instruction during nursing staff orientation, and a binder Kardex with visual and written information on IAD treatment. The wound care consultants identified that the focus of the content related to IAD was on identification, prevention, and management strategies.

Secondly, I conducted an internet search to identify existing provincial and national educational resources related to IAD that could inform the development of an educational resource for nursing staff of Central Health. Eight relevant resources were identified from two provincial organizations and two national organizations. These resources included a webinar

from Registered Nurses Association of Ontario (RNAO), a practice guideline summary from British Columbia's Connecting Learners with Knowledge (CLWK), and a webinar related to skin and wound health with content on IAD offered by Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC). Additionally, Wounds Canada have offered online learning modules, webinars, and in-person conferences that included education related to IAD. All data collected from the internet search was input into an Excel document and was included in the content analysis along with the data derived from the consultations with provincial wound care consultants.

The 15 resources retrieved from the environmental scan, seven from the consultations with wound care consultants and eight from the internet search, were analyzed and common topics were identified that had direct implications for the development of this resource related to content, method of delivery, and evaluation. Each of the resources examined in the scan took a similar approach on what IAD content was included. The most common content included within the various resources was risk factors for IAD such as urinary and fecal incontinence, friction and shearing issues, and altered mental or physical well-being. This supported the findings from the literature review that nursing staff should be aware of these common risk factors for IAD to assist in the identification of at-risk clients and promote the early implementation of prevention and treatment measures. Additionally, common content included in the resources retrieved incorporated prevention and treatment guidelines such as the use of moisturizers and barriers, providing frequent personal care, and optimizing nutrition and hydration. This supported similar findings from the literature review that these care guidelines were effective in preventing and treating IAD, therefore it was decided that the content areas of risk factors and care prevention and treatment guidelines would be included in the educational resource developed. It was also

determined that three resources utilized a method of delivery that included best practices guidelines in a concise chart-like format where information was relayed using pictures and written descriptions in an organized one-page document that staff could reviewed independently. This supported the evidence obtained through the literature review regarding the effectiveness of standard guidelines and visual aids. The self-directed nature of best practice guidelines printed in a chart format for independent reading aligns with Knowles' (1978) theory of adult learning that suggests that adult learners are self-directed and prefer to complete knowledge acquisition through independent means. Therefore, this format was considered for use for the educational resource for this project, pending feedback from the consultation phase. To obtain the necessary feedback regarding the methods of delivery identified from the environmental report a consultation survey and interview guide was developed so that key stakeholders could identify which methods were preferred and if any perceived barriers existed. Please see Appendix B for the entire environmental scan report.

Consultations

I conducted the consultations for the resource development as two separate processes. First, a sample of nursing staff who provide direct client care were chosen for consultation for this project to determine their learning needs related to IAD and to ascertain their preferred method of education delivery for the educational resource. Knowles (1978) theory supported this approach as he maintained that adults prefer to be involved in how their educational experiences are planned and delivered. The sample for the consultations included nursing staff from both the acute care and the long-term care settings with various levels of experience, ranging from novice to senior nurses. This sample was used to determine if any differences in learning needs specific to nursing experience existed and help guide resource development to meet the needs for all

nursing staff in a variety of settings. Hard copy surveys consisting of three multiple choice questions and five 4-point Likert questions were distributed to a total of eight nursing staff: four staff in acute care and four staff in the long-term care setting who agreed to participate. Participants were asked to identify their discipline and the number of years they have been in their current role. Of the four nursing staff who participated from acute care, two were novice staff and two were senior. Similarly, of the four nursing staff from long-term care, two were novice and two were senior. Participants were asked to rate their level of agreement to statements regarding their knowledge levels in specific areas concerning IAD as well as their level of agreement of having interest in receiving education on IAD using strongly agree, agree, disagree, or strongly disagree. Lastly, participants were asked to identify the method(s) they would prefer to receive education regarding IAD. All eight surveys that were distributed were completed and returned by the one-week deadline given. Findings from the completed surveys were compiled in an Excel document and were later analyzed using descriptive statistics.

The survey results revealed that 25% of participants, 12.5% being novice staff from acute care and 12.5% senior staff from acute care, chose “disagree” on the Likert scale to the question that they had sufficient knowledge on the definition and etiology of IAD. Additionally, 25% of participants who were all novice staff in acute care chose “disagree” on the Likert scale to the question which asked if they had knowledge on both risk factors and prevention measures for IAD. Also, 37.5% of participants who were noted to be both novice and senior staff from acute care, chose “disagree” on the Likert scale to the question that asked if they had knowledge on treatment strategies for IAD. These findings supported that the development of a resource regarding IAD containing information on areas of definition and etiology, risk factors, prevention measures, and treatment strategies would be an asset for all novice or newly hired

staff, especially in acute care. Furthermore, participants were asked to rate their level of agreement of having interest in receiving education related to IAD. Of the eight participants, six strongly agreed to the statement that they were interested in receiving IAD education, while the remaining two participants agreed. No participants disagreed or strongly disagreed with this statement. This suggested that nursing staff would be interested in participating in an educational strategy related to IAD. The staff were then asked to identify preferred methods of education delivery and the most popular method chosen by participants was the in-person option. Both electronic format and posters or infographics were the second highest chosen options, while written material was chosen as the third most popular option.

The second means of conducting consultations was with Central Health's wound care consultants. They were chosen for consultation as they are the specialists in skin and wound care for the health authority and are frequently consulted by nursing staff when caring for clients who have IAD to assist with determining and implementing treatment plans for these clients. Additionally, they are often the staff who develop and implement educational programs for nursing staff related to skin and wound care. Therefore, they would be most familiar with the learning needs of nursing staff related to IAD and barriers to specific methods of education delivery. Information was collected from two wound care consultants through individual semi-structured interviews via telephone conversation and email correspondence. An interview guide consisting of open-ended questions based on the findings from the literature review and the environmental scan was used to facilitate the interviews and can be found in Appendix C of the consultation report within this document. The questions were related to their experiences with clients with IAD, perceived learning needs of nursing staff, potential methods of education delivery, and perceived barriers to providing education to nursing staff related to IAD.

Handwritten notes were recorded during the interviews and were later typed into a Word document for content analysis and identification of common topics.

The results of the interviews with wound care consultants revealed that they have had first-hand experience caring for clients with IAD and have seen the negative impacts that IAD can have. Additionally, they stated that there are areas of knowledge regarding IAD that staff can improve upon and that an educational resource could help fill this gap. Specifically, they identified that skin care and maintaining continence, factors that reduce IAD, are not always given high priority by nursing staff due to perceived time constraints. They also reported that staff have difficulty differentiating IAD from PI and often struggle with selecting best treatment options. Consultants were asked to share their thoughts about the potential methods of education delivery for the resource that had been previously identified through the environmental scan. They were also asked to identify any perceived barriers to education delivery for nursing staff. They reported that in-person learning sessions are challenging since it is difficult to bring staff together due to time limitations that all staff are experiencing. Electronic learning was identified as being the best source for providing the greatest access to information for staff but consultants also identified a limitation to this is that there is currently an inability to audit completion of education within the learning management system. Also, it was identified by both wound care consultants that concise and clear methods for mobilizing IAD knowledge would be useful for nursing staff, such as posters or charts with graphics and algorithms outlining steps and treatment measures. They also indicated that it would be important to include visual aids in any educational resource developed for this project, thus this was taken into consideration when the delivery method was chosen for the resource. Lastly, the wound care consultants suggested that the creation of a pamphlet for clients, families, and caregivers would be a beneficial tool that nursing

staff could use to educate clients and those involved in their care on how to prevent and treat IAD, especially in the community setting. Please refer to Appendix C for the entire consultation report.

Summary of the Resource Developed

The resource I developed for this practicum project is a comprehensive toolkit for nursing staff titled "Understanding Incontinence-Associated Dermatitis (IAD): Prevention and Treatment. A Toolkit for Nursing Staff of Central Health". This toolkit is 49 pages in length and content is organized by 6 sections: (1) recognizing IAD, (2) causes of IAD, (3) implications of IAD, (4) prevention of IAD, (5) the A.C.T. approach to prevention and management strategies, and (6) a team approach to care. Each section provides written information that is clear and easy to read, complemented by graphics and pictures where applicable. At the end of the content there is a 20 question self-assessment quiz consisting of true or false, multiple choice, and fill in the blank questions with an accompanying answer key. Staff can use this assessment to test their own knowledge acquisition. The toolkit is intended to be used in an electronic format on Central Health's Intranet or the learning management system. However, individuals can choose to print hard copies if they wish to do so.

Knowles' (1978) theory of adult learning supported the inclusion of multiple strategies to meet the learning needs of professional adults such as nursing staff, therefore the toolkit developed consisted of multiple learning strategies, such as the use of written text, pictures, self-assessment quiz, as well as an accompanying guideline and pamphlet. The toolkit includes a one-page summary of practices guidelines based on best practice evidence, outlining a structured approach to prevention and management strategies related to IAD. This format was indicated as being an effective learning strategy in the literature review, was identified as a common method

of delivery in the environmental scan, and was recommended by wound consultants in the consultation interviews. The guideline summary can be printed in poster format and displayed in clinical areas for nursing staff to refer to for guidance when providing care to clients who experience incontinence. The information for the guideline summary was derived directly from the toolkit to maintain consistency. The toolkit also includes an educational pamphlet for clients, families, and caregivers on how they can participate in the prevention and management of IAD. The need for such a pamphlet was indicated by key stakeholders in the consultation phase of this project development. It was felt that the pamphlet can be used as a tool by staff to educate clients, families, and caregivers about IAD and thus, aid in its prevention and management, especially in the community setting. Information for the pamphlet was also adapted directly from the toolkit and is presented in a simplified manner.

Discussion of Advanced Nursing Practice (ANP) Competencies

During the practicum project I have had the opportunity to practice several of the advanced nurse competencies outlined by the Canadian Nurse Association's (2019) framework for advanced nursing practice (ANP). As a graduate student it is important to be familiar with the CNA's framework to ensure that as I transition into an ANP role that I am aware of the roles and expectations that must be upheld. The specific competencies that I will discuss in relation to the development of the educational resource include consultation and collaboration, research, and leadership.

Consultation and collaboration

Throughout the practicum project there were multiple times that I had to consult and collaborate. Initially, I participated in informal discussions with the wound care consultant at my

facility which led me to determine the focus of my practicum project and the eventual development of an educational resource. This clinician became my key contact for the duration of the project providing feedback and direction during the resource development. I also collaborated with my practicum supervisor as we determined timelines for assignment submissions and maintained goals for the project using open communication and two-way feedback. During the consultation phase of the practicum, I identified key stakeholders who could provide important data for the development of the project. Central Health's wound care consultants and nursing staff who provide direct client care were formally consulted via interviews and surveys which I developed. These key consultants were utilized to identify if a need existed for an educational resource for Central Health, to identify the preferred content, and the best method of delivery for the resource. Obtaining input from those invested in the topic provided valuable information for the project and in developing an effective resource.

Research

Even though I did not conduct a research practicum, I have practiced research competencies throughout the N6660 and N6661courses. Through the process of conducting an integrated literature review I was able to successfully identify and critically appraise relevant literature that supported the need for a development of a resource related to IAD. In collaboration with staff and through consultations, I was also able to implement other research-based evidence into the content of the toolkit to educate nursing staff on how to prevent and manage IAD based on best practice evidence.

Leadership

I have developed leadership competency by first recognizing a possible knowledge gap related to IAD and then exploring the possible gap through conducting a literary review, environmental scan, and consultations. The topic of IAD was identified as a priority for the lead wound care consultant at Central Health and alongside this clinician, I initiated change on the clinical level by exploring the development of a resource intended to educate and guide nursing staff in their practice. With the knowledge gained through my key methods I developed a resource for IAD. By developing a preliminary plan for implementation and evaluation, I will be able to guide the key contact on an approach to implement the toolkit in clinical areas, with the expectation that the implementation will lead to improved outcomes for the client population.

Next Steps

With the conclusion of N6661 I will present the toolkit and the developed implementation and evaluation plan to my key contact, Nicole Pitcher who will share this with her fellow wound care consultants in the region. These key individuals will have the ability to complete any final revisions to the toolkit and decide on a timeframe for implementation. Although the implementation phase will be conducted by Nicole and her team, I will make myself available for consultation when needed. As a plan for implementation, it was decided that the toolkit would first be piloted in one long-term care facility in Grand Falls – Windsor and would be evaluated using pre- and post-implementation surveys. If the evaluation of the pilot supports the effectiveness of the toolkit it would then be implemented into further clinical areas.

The anticipated plan to facilitate the implementation is that the wound care consultant

responsible for long-term care will meet with the nurse educators from the chosen facility to inform them of the resource and its implementation into their care setting. The nurse educators of the long-term care centre will distribute developed surveys to all nursing staff in the facility a month prior to resource implementation. This will allow the wound care consultants to obtain a baseline level of knowledge that nursing staff from the long-term care facility have on IAD. Staff will be given one week to complete and return the survey to one of the nurse educators. The educators will collect and deliver the completed surveys to the wound care consultant at the end of that week and will assist with notifying staff on how to access the electronic link for the toolkit. Additionally, the educators will determine the most appropriate locations near nursing stations to display the practice guideline summary in poster format and inform nursing staff on both the location and purpose of the practice guideline summary. The educators will also help to encourage staff to review the posters and advise them to refer to the poster when making care decisions for incontinent clients. The supplemental pamphlets for families and caregivers would not be included in this initial pilot but will be distributed when the toolkit is implemented in other areas such as acute care and the community setting. Once the toolkit has been implemented in the practice area for six months a second survey will be distributed to nursing staff in the same manner. This survey will include the same knowledge-based questions as the pre-implementation survey but will also contain a section of questions regarding staff's satisfaction with the resource in terms of inclusiveness of content, clarity of information, and usefulness of the resource. Staff will also be asked if they felt any changes should be made to the toolkit. This information will be useful in making any modifications or improvements prior to implementation of the toolkit in other areas.

Conclusion

It was evident through practicum development that IAD is a condition that can have impacts to not only the health and well-being of clients in any healthcare setting but also to the healthcare system itself. Nursing staff who provide direct client care must be knowledgeable about IAD and best practice evidence related to prevention and management of IAD to decrease the prevalence and severity of IAD. Through multiple methods, I was able to identify a possible gap in knowledge, determine that a need existed for an educational resource for nursing staff at Central Health related to IAD, and develop a comprehensive toolkit with resources to meet this need. An integrative literature review not only supported the need for a resource related to IAD for nursing staff but also helped inform content to be included in the resource. An environmental scan provided data on common topics related to content, method of delivery, and evaluation that had implications for the resource development. Consultations with key stakeholders assisted in selecting the content and method of delivery of the resource. The developed toolkit includes six sections of content related to IAD and has an integrated self-assessment quiz to test knowledge acquisition. Also included in the toolkit is a one-page practice guideline summary for staff and a pamphlet for clients, families, and caregivers. A plan for implementation and evaluation has been developed and will be presented along with the toolkit to the key contact of this project. The creation of the toolkit is expected to enhance the knowledge of nursing staff regarding IAD and with the eventual implementation of the toolkit it is expected that there will be improved care client outcomes related to IAD.

References

Alcoforado, C., Lopes, F. O., Fernandes, R. de A., Carvalho, R. L. R. de, Guillen, M. R. S., Ercole, F. F., & Chianca, T. C. M. (2019). Knowledge of nursing professionals about dermatitis associated with incontinence and pressure injury. *Reme Revista Mineira de Enfermagem, 23*, e-1166. https://doi.org/10.5935/1415-2762.20190014

Barakat-Johnson, M., Stephenson, J., Basjarahil, S., Campbell, J., Cunich, M., Disher, G., Geering, S., Ko, N., Lai, M., Leahy, C., Leong, T., McClure, E., O'Grady, M., Walsh, J., White, K., & Coyer, F. (2022). Clinician knowledge of incontinence-associated dermatitis: A multisite survey of healthcare professionals in acute and subacute settings. *Journal of Wound Ostomy and Continence Nursing, 49*(2), 159–167. https://doi.org/10.1097/WON.0000000000000846

Bates, A. N., & Ercolano, E. (2021). Development and implementation of a simple wound care guideline for minor skin lesions: A quality improvement project. *Journal of Wound, Ostomy and Continence Nursing, 48*(4), 285–291. https://doi.org/10.1097/WON.0000000000000778

Beeckman, D. (2016). A decade of research on incontinence- associated dermatitis (IAD): Evidence, knowledge gaps and next steps. *Journal of Tissue Viability, 26*(1), 47–56. https://doi.org/10.1016/j.jtv.2016.02.004

Beeckman, D., Schoonhoven, L., Fletcher, J., Furtado, K., Heyman, H., Paquay, L., De Bacquer, D., & Defloor, T. (2010). Pressure ulcers and incontinence-associated dermatitis: effectiveness of the pressure ulcer classification education tool on classification by

nurses. *Quality & safety in health care*, *19*(5), e3-E3. https://doi.org/10.1136/qshc.2008.028415

Bredesen, I., M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification: A randomized study. *Nurse Education Today, 40*, 191–197. https://doi.org/10.1016/j.nedt.2016.03.008

Canadian Nurses Association. (2019). *Advanced practice nursing: A Pan-Canadian Framework.* 2_1136 Advanced Practice Nursing framework EN.indd (hl-prod-ca-oc-download.s3-ca-central-1.amazonaws.com)

Conley, P., McKinsey, D., Ross, O., Ramsey, A., & Feeback, J. (2014). Does skin care frequency affect the severity of incontinence-associated dermatitis in critically ill patients? *Nursing, 44*(12), 27–32. https://doi.org/10.1097/01.NURSE.0000456382.63520.24

Corcoran, E., & Woodward, S. (2013). Incontinence-associated dermatitis in the elderly: Treatment options. *British Journal of Nursing*, *22*(8), 450–457. https://doi.org/10.12968/bjon.2013.22.8.450

del Cotillo-Fuente, M., Valls-Matarín, J., & Sandalinas-Mulero, I. (2021). Efficacy of a comprehensive strategy to reduce moisture-associated skin damage in an intensive care unit: A quasi-experimental study. *Intensive & Critical Care Nursing, 63,* 102964–102964. https://doi.org/10.1016/j.iccn.2020.102964

Ferreira, M., Abbade, L., Bocchi, S. C. M., Miot, H. A., Boas, P. V., & Guimaraes, H. Q. C. P. (2020). Incontinence-associated dermatitis in elderly patients: prevalence and risk factors. *Revista Brasileira de Enfermagem, 73*(Suppl 3), 1–6. https://doi.org/10.1590/0034-7167-2018-0475

Gray, M., & Giuliano, K. K. (2018). Incontinence-associated dermatitis, characteristics and relationship to pressure injury: A multisite epidemiologic analysis. *Journal of Wound, Ostomy and Continence Nursing*, *45*(1), 63–67. https://doi.org/10.1097/WON.0000000000000390

Johansen, E., Bakken, L. N., Duvaland, E., Faulstich, J., Hoelstad, H. L., Moore, Z., Vestby, E. M., & Beeckman, D. (2018). Incontinence-associated dermatitis (IAD): Prevalence and associated factors in 4 Hospitals in Southeast Norway. *Journal of Wound, Ostomy and Continence Nursing*, *45*(6), 527–531. https://doi.org/10.1097/WON.0000000000000480

Kayser, S. A., Koloms, K., Murray, A., Khawar, W., & Gray, M. (2021). Incontinence and incontinence-associated dermatitis in acute care: A retrospective analysis of total cost of care and patient outcomes from the Premier Healthcare Database. *Journal of Wound, Ostomy and Continence Nursing*, *48*(6), 545–552. https://doi.org/10.1097/WON.0000000000000818

Kayser, S. A., Phipps, L., VanGilder, C., & Lachenbruch, C. (2019). Examining prevalence and risk factors of incontinence-associated dermatitis using the International Pressure Ulcer Prevalence Survey. *Journal of Wound, Ostomy and Continence Nursing*, *46*(4), 285-290. https://doi.org/10.1097/WON.0000000000000548

Kon, Y., Ichikawa-Shigeta, Y., Iuchi, T., Nakajima, Y., Nakagami, G., Tabata, K., Sanada, H., & Sugama, J. (2017). Effects of a skin barrier cream on management of incontinence-associated dermatitis in older women: A cluster randomized controlled trial. *Journal of*

Wound, Ostomy and Continence Nursing, *44*(5), 481–486. https://doi.org/10.1097/WON.0000000000000353

Kottner, J. & Surber, C. (2016). Skin care in nursing: A critical discussion of nursing practice and research. *International Journal of Nursing Studies*, *61*, 20–28. https://doi.org/10.1016/j.ijnurstu.2016.05.002

LeBlanc, K., Forest-Lalande, L., Rajhathy, E., Parsons, L., Hill, M., Kuhnke, J.L., Hoover, J., Lillington, T., & Cyr, M.H. (2020). Best practice recommendations for the prevention and management of moisture-associated skin damage. In: *Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada* (pp. 1-52) https://www.woundscanada.ca/doclink/wc-bpr-prevention-and-management-of-moisture-associated-skin-damage-1949e-final/

Lee, Y. J., & Kim, J. Y. (2016). Effects of pressure ulcer classification system education programme on knowledge and visual differential diagnostic ability of pressure ulcer classification and incontinence-associated dermatitis for clinical nurses in Korea. *International Wound Journal*, *13*(S1), 26–32. https://doi.org/10.1111/iwj.12546

Lin, T., Hwang, M., Nien, H., Liu, C., Shie, P., & Chen, S. (2015). Reducing the incidence of incontinence associated dermatitis in intensive care unit diarrhea patients. *Hu Li Za Zhi the Journal of Nursing*, *62*(6), 81-89. https://doi.org/10.6224/JN.62.6.81

Phipps, L., Gray, M., & Call, E. (2019). Time of onset to changes in skin condition during exposure to synthetic urine: A prospective study. *Journal of Wound, Ostomy and Continence Nursing*, *46*(4), 315–320. https://doi.org/10.1097/WON.0000000000000549

Şahin, F., Karadağ, A., & Avşar, P. (2019). A survey of Turkish nurses' knowledge of incontinence-associated dermatitis. *Journal of Wound, Ostomy and Continence Nursing, 46* (5), 434-440. https://doi.org/10.1097/WON.0000000000000567

Strehlow, B. R., Fortes, V. L. F., & de Amarante, M. V. (2018). Incontinence-associated dermatitis in hospitalized elderly: Nurses' self-reported knowledge. *Revista de Pesquisa, Cuidado é Fundamental*, *10*(3), 801–809. https://doi.org/10.9789/2175-5361.2018.v10i3.801-809

Sving, E., Fredriksson, L., Gunningberg, L., & Mamhidir, A. G. (2017). Getting evidence-based pressure ulcer prevention into practice: A process evaluation of a multifaceted intervention in a hospital setting. *Journal of Clinical Nursing*, *26*(19-20), 3200–3211. https://doi.org/10.1111/jocn.13668

Ursavaş, F. E., & İşeri, Ö. (2020). Effects of education about prevention of pressure ulcer on knowledge and attitudes of nursing students. *Journal of Tissue Viability*, *29*(4), 331–336. https://doi.org/10.1016/j.jtv.2020.06.006

Van Damme, N., Van den Bussche, K., De Meyer, D., Van Hecke, A., Verhaeghe, S., & Beeckman, D. (2017). Independent risk factors for the development of skin erosion due to incontinence (incontinence-associated dermatitis category 2) in nursing home residents: Results from a multivariate binary regression analysis. *International Wound Journal*, *14*(5), 801–810. https://doi.org/10.1111/iwj.12699

Wassel, C. L., Delhougne, G., Gayle, J. A., Dreyfus, J., & Larson, B. (2020). Risk of readmissions, mortality, and hospital-acquired conditions across hospital-acquired

pressure injury (HAPI) stages in a US national hospital discharge database. *International Wound Journal*, *17*(6), 1924–1934. https://doi.org/10.1111/iwj.13482

Yates, A. (2020). Incontinence-associated dermatitis 1: Risk factors for skin damage. *Nursing Times*, *116*(3), 45–50.

Zhang, X., Wang, X., Zhao, X., & Zhang, Y. (2022). A structured skin care protocol for preventing and treating incontinence-associated dermatitis in critically ill patients. *Advances in Skin & Wound Care*, *35*(6), 335–342. https://doi.org/10.1097/01.ASW.0000828972.70137.8a

Appendix A: Integrated Literature Review

Stephanie Buffett

Nursing care aims to provide holistic care for all clients. A holistic approach to direct nursing care must include a complete assessment of skin integrity to maintain health and absence of disease (Kottner & Surber, 2016). Completing thorough assessments allows the nurse to recognize abnormal findings and guide implementation of appropriate treatment measures (Benbow, 2017). One of these abnormal findings is incontinence-associated dermatitis (IAD), a skin irritation that occurs when there is repeated exposure to urine and/or feces (Beeckman, 2016). IAD is marked by redness, inflammation, pain, and lesions in the areas of the genitalia and buttock (Beeckman, 2016). IAD is prevalent in most client care settings, including long-term care, acute medical and surgical units, and intensive care settings (Ferreria et al., 2020; Johansen et al., 2018; Kayser et al., 2019; Van Damme et al., 2017). Furthermore, in a study that examined the prevalence of IAD in healthcare settings in Canada and the United States it was determined that one in five people who experience incontinence developed symptoms of IAD (Kaysar et al., 2019). With this level of prevalence, it is crucial that nursing staff in all care settings have knowledge regarding risk reduction and prevention of IAD, as well as treatment and management strategies to optimize best outcomes for clients (Benbow, 2017). According to a wound care consultant/Nurse Specialized in Wound, Ostomy, and Continence (NSWOC), Central Health currently does not have an educational resource and practice guidelines directly focused on IAD. This nurse specialist believes that such an educational resource would be of benefit to nursing staff who provide direct care for clients and in turn, would promote best possible outcomes for clients. This literature review was carried out to determine if evidence exists to support this belief.

The purpose of the literature review is to determine if evidence exists to support the need for an IAD resource to inform nursing staff and assist with knowledge translation for early

recognition and management of IAD symptoms. This literature review will examine the level of knowledge nurses have related to IAD to support the belief that an educational resource is needed. I will provide evidence that examines the implications IAD can have for clients' well-being and the healthcare system. Additionally, I will discuss findings from the literature that will be included as content in the resource, such as risk factors and best practice guidelines in the area of IAD. Finally, I will also examine effective ways to mobilize this information to nursing staff to promote integration into practice.

Guiding Theory

Knowles' adult learning theory guided aspects of this literature review. Adults are practical learners and wish for education to be relevant to their professional or personal lives (Knowles, 1978). The focus of this resource, IAD, has been identified as a relevant topic of interest for nursing staff providing direct client care, therefore will meet aspects of the adult learning theory. This relevance to practice will facilitate engagement into their own learning experience. Knowles' theory was used to guide selection of some of the evidence retrieved and provides support for the inclusion of evidence as content in the resource.

Search Strategies

This integrative review was conducted using the databases PubMed and CINAHL, through the Memorial University of Newfound and Labrador library website. Key search terms included "nurs*", "incontinence-associated dermatitis", "IAD", "prevention", "management", "education", and "resource". The search filter was set to display English articles only. Publication dates were narrowed to 2012 – 2022, however if the reference list of an article revealed a publication that was slightly older but relevant, it was included for analysis. The titles

of the articles were first read to determine relevance and then abstracts were read. Articles that appeared relevant were then read in detail. An additional search was conducted in Google Scholar in the same manner. Other strategies included conducting an online search through Cochrane library and Joanna Briggs Institute, using similar parameters as above. Grey literature published by wound care associations and other organizations within Newfoundland and Labrador and Canada were reviewed.

Appraisal of the Evidence

Quantitative research articles were critically appraised using the Public Health Agency of Canada's (2014) Critical Appraisal Tool Kit, while qualitative research articles were critically appraised using the Critical Appraisal Skills Program (2018) resource. These tools were used to determine the quality of the evidence findings. The analysis of the evidence was summarized and arranged in a thematic manner by grouping studies by the aspect of the project they were focused on. Additionally, a concise summary of the findings is provided in the literature summary tables in Appendix A.

Support for the Need of an Educational Resource

Two of main topics that were evident in the literature were the implications that IAD can have for both clients and the healthcare system and the knowledge level nursing staff have related to IAD. These findings supported the key contact's conceptualization that there is a need for an educational resource for nursing staff related to IAD.

Implications of IAD

The evidence suggests that occurrences of IAD have significant implications for the clients who develop it and for the healthcare system. Clients with IAD have an increased risk of

developing more serious complications if untreated (Yates, 2020). The findings from the evidence determined that the presence of IAD was significantly associated with the development of a sacral pressure ulcer (Gray & Giuliano, 2018; Kayar et al., 2021). Furthermore, there is a significant association between the presence of IAD and the development of a facility- acquired full-thickness sacral injury, a severe type of pressure ulcer (Gray and Giliano, 2018). Other complications that can arise once a client has developed IAD include the occurrence of fungal and bacterial infections (Conley et al., 2014; Ferrerira et al., 2020). These complications can have a profound impact on the plan of care of hospitalized clients and can have significant implications for the healthcare system.

One of the ways that incidences of IAD can impact the healthcare system is that clients who develop IAD during their hospitalization are more likely to have longer lengths of stay than those who do not and are more likely to have higher rates of readmission to the hospital once discharged (Kayser er al., 2021). These factors have a direct impact on the healthcare system by decreasing the available beds for admission of clients and creating longer wait times for healthcare services (Kayser et al., 2021). Furthermore, the evidence suggests that clients who were receiving treatment for IAD and/or its complications created significantly higher direct healthcare costs than those who did not have IAD (Kaysar et al., 2021; Wassel et al., 2020).

It is proposed that if nursing staff are aware of the impacts that IAD can have for clients and the healthcare system it would reinforce the necessity of the implementation of preventative and management strategies into nursing care, therefore, supporting the need for the development of an educational resource for nurses related to IAD prevention and management. Additionally, according to Knowles' adult learning theory adults need to know the reasons why they must learn the material presented to them (Knowles, 1978). Therefore, it would be important to

include the implications of IAD in the content of the resource so that nursing staff become engaged to their learning experience and are motivated to learn the material.

Nurses' Knowledge of IAD

The literature suggests that nurses' overall level of knowledge of IAD is low. Four studies retrieved for this literature review have focused on measuring nurses' knowledge of IAD in three areas: definition/etiology, diagnosis, and prevention and management (Alcoforado et al., 2019; Barakat-Johnson et al., 2022; Sahin et al., 2019; Strehlow et al., 2018). In their study, Barakat-Johnson et al. (2022) asserted that if a nurse scored a 70% on a knowledge assessment related to IAD that this translated to having a satisfactory level of knowledge on the topic. This score level was used as a baseline to determine if the knowledge levels of nurses regarding IAD were satisfactory in the remaining studies in this literature review.

Definition/Etiology. The level of knowledge that nurses have related to the definition and etiology of IAD is conflicting in the research. Two studies determined that nurses' knowledge of the definition/etiology of IAD was satisfactory as they scored above 70% on their knowledge assessments (Alcoforado et al., 2019; Barakat-Johnson et al., 2022). These results differ from Sahin et al. (2019) who determined that the nurses in their study had a much lower level of IAD knowledge related to the definition/etiology as they earned an average score of 52.5% Although the evidence is conflicting, it supports the inclusion of content material related to the definition of IAD and its etiology in the educational resource for nursing staff.

Diagnosis. It is apparent in the literature that nurses have a below satisfactory level of knowledge regarding the diagnostic aspect of IAD. Four quantitative studies reviewed determined that nurses received scores below the satisfactory level of 70% on testing questions that involve recognizing and diagnosing the occurrence of IAD (Alcoforado et al., 2019;

Barakat-Johnson et al., 2022; Sahin et al., 2019). Interestingly, Acoforado et al. (2019) utilized both written questions and visual depictions to assess nurses' knowledge of diagnosing IAD and found scores to be consistently low in both evaluation methods. This suggests that nurses have a below average theoretical knowledge base in this area and are also weak in the practical application of the knowledge using real life examples. Lending a qualitative perspective, Sterhlow et al. (2018) concluded that nurses were able to recognize signs of IAD, but they could not distinguish between the different types or classes. This inability to distinguish between the different classes of IAD has the potential to hinder a correct diagnosis and implementation of appropriate treatment measures. These findings support including knowledge related to the diagnosis of IAD in the educational resource for nursing staff as well as using visual depictions as a key component of the content.

Prevention and Treatment. The findings within the literature on nurses' knowledge regarding IAD prevention and treatment are differing. The studies by Barakat-Johnson et al. (2022) and Sahin et al. (2019) found that nurses had a low level of knowledge regarding IAD prevention and treatment This is supported by qualitative findings that nurses report having a general lack of knowledge on treatment of IAD and had little consistency in their care practices (Strehlow et al., 2018). In contrast, one study determined that the nurses' knowledge of preventative and management measures related to IAD was satisfactory as participants achieved an average score of 78.28% (Alcoforado et al., 2019). Three of the four studies concluded that nurses' have a subpar level of knowledge related to IAD prevention and management, thus supports the inclusion of this content material in the development of the IAD resource for nursing staff.

Conclusion of Findings. The evidence suggests that nursing staff have an overall low level of knowledge in the areas of IAD definition/etiology, diagnosis, and prevention and management. This conclusion supports the idea that an educational resource related to IAD knowledge would be an asset for nursing staff. The content of the resource would focus on the common knowledge areas studied in the literature, pending supporting data from the environmental scan and consultations.

Information to be Used as Content for the Resource

When developing an educational resource for nursing staff it is imperative that the content be based on empirical evidence and expert knowledge (Horntvedt et al., 2018). This section of the literature review will identify information that will be included in the educational resource for nursing staff related to IAD. First, I will identify common risk factors for the development of IAD in clients and then I will discuss best practice guidelines for the prevention and management of IAD based on quantitative evidence.

Risk/Contributory Factors

Once knowledgeable about which clients are at an increased risk for the development of IAD, nurses can be more vigilant with prevention measures and can initiate them earlier in their care, reducing the likelihood of the development of IAD and its complications (Van Damme et al., 2017). Therefore, it is essential that nursing staff are equipped with knowledge about the specific contributory factors that place clients at risk for IAD. Researchers have identified that the common risk factors that predispose individuals for developing IAD are obesity, impaired mobility, friction and linen issues, and frequency of personal care provided.

Obesity. Obesity is defined as a health condition that occurs when a client has an excessive amount of body fat and their body mass index is greater than 30 (Kopleman, 2000). Three studies concluded that obesity is significantly associated with the development of IAD (Ferreria et al., 2020; Kaysar et al., 2019; Kottner & Surber., 2016). Additionally, Kaysar et al. (2019) found that each additional 20kg of weight a client carried above a healthy weight significantly increased the likelihood of development of IAD (OR=1.22, $p<0.001$). Therefore, if a nurse is aware that obesity is a risk factor for IAD early assessment combined with proper monitoring could decrease the chance of its occurrence.

Impaired Mobility. Impaired mobility results from a decrease in a person's range of motion and an inability to move purposefully in their environment limiting their functional ability of daily living (Gray-Miceli, 2017). Impaired mobility is a significant risk factor for the development of IAD. Five studies have found a significant association between limited or impaired mobility and the development of IAD in clients (Gray & Giuliano, 2018; Johansen et al., 2018; Kaysar et al.,2019; Kaysar et al., 2021; Kottner & Surber, 2016). Similarly, Ferreira et al. (2020) determined that a client's high level of dependence for care, including mobility assistance, was significantly associated with occurrences of IAD. This evidence supports that limited mobility places a client at risk for IAD, therefore, if nursing staff routinely assess these clients than one can assume that early recognition with implementation of preventative measures for IAD would result in less incidences resulting in better client outcomes.

Friction/Linen. Clients in healthcare facilities are routinely exposed to opportunities for friction and shear from bed linen and other surfaces (Kotowski et al., 2013). Three studies suggests that there is a positive association between the development of IAD and exposure to friction and shear (Kaysar et al., 2019; Kottner & Surber, 2016; Van Damme, et al., 2017).

Furthermore, it was found that each additional linen layer on a client's bed increased the likelihood of developing IAD by 8.3% (Kaysar et al., 2019). This evidence supports that by limiting the use of unnecessary layers of linen on a client's bed, as well nursing staff reducing the potential shearing effect that surfaces can create on a client's skin, clients would be at a reduced risk for IAD.

Frequency of Care Provided. The frequency that personal care is provided to clients who experience incontinence can have a significant impact on the development of IAD (Conley et al., 2014; Phipps et al., 2019). Phipps et al. (2019) explored the impact that length of time urine contacted clients' skin had on their risk for IAD development. The researchers utilized bioinstrumentation measurement tools such as skin pH meter and corenometer in a laboratory setting to determine that there were statistically significant increases in moisture content of skin, skin pH, and erythema, all factors associated with IAD development, at 15 minutes post-exposure to urine and at every other time point measured (30 minute, and 1, 2, and 4 hours) (Phipps et al., 2019). Conley et al. (2014) examined whether frequency of skin care routine on incontinent clients affected the occurrence of IAD and found that individuals who had skin care completed every six hours and as needed had significantly less cases of moderate IAD than those who had skin care completed every 12 hours and as needed (7.1% vs. 10.9%, $p<0.001$). Therefore, it can be concluded that clients are more likely to develop IAD or worsening of already present symptoms when the length of time increases between when they are incontinent and when they receive personal care including incontinence pad changing,

Nursing staff must provide frequent personal care to their incontinent clients, including changing of incontinent products, up to a maximum of every four to six hours to reduce the risk for the development of IAD. Furthermore, the aim should be that personal care is provided as

soon as possible after the episode of incontinence occurs to further reduce the risk of IAD development and progression.

Conclusion of Findings. Evidence from this literature review suggests that there are common risk factors that can contribute to the development of IAD. These risk factors will be considered for inclusion in the educational resource to assist nursing staff in identifying clients at risk for IAD and guide the early implementation of prevention measures if it is supported by the environmental scan and consultations.

Best Practice Guidelines

Evidence-based practice (EBP) in nursing is the process of integrating research findings into clinical practice to ensure quality of healthcare services (Rahmayanti et al., 2020). Best practice guidelines are derived from EBP and can be used to guide nurses in applying evidence into their practice by providing practice recommendations and procedural instructions. It is important that the content of an educational resource for nursing staff related to IAD be constructed on best practice evidence to align their practice with empirical evidence to guide quality care and promote optimal healthcare outcomes for clients The use of standard guidelines can serve as educational material and help to improve nurses' competency when applied in the clinical setting (Lee et al., 2020).

The key contact for this project suggested that I review grey literature authored by national wound care associations such as Wounds Canada. Wounds Canada is a charitable organization whose mission is to advance the prevention and management of wounds while aiming to decrease the prevalence of all wounds in Canada (Wounds Canada, 2022). They provide best practice guidelines for nurses and other healthcare practitioners in relation to skin

and wound care, including IAD (Wounds Canada, 2022). These guidelines will be considered as the focus for the content of the resource and will be complemented by additional evidence appraised for this review. Wounds Canada suggests that a standard, comprehensive skin care regimen consisting of the consistent use of such products as disposable cloths, gentle no-rinse cleansers, moisturizer, and barrier film or cream must be implemented for at risk clients to prevent and treat IAD (Leblanc et al., 2020). Three quantitative studies from this literature review examined standard comprehensive care guidelines used to prevent and treat IAD. In their study, Glass et al. (2020) tested a skin care guideline that included the use of a no-rinse cleanser, skin protectant, a barrier cream, and disposable wipes. Kon et al. (2017) utilized an approach in their study that included a skin barrier cream that acts as moisturizer and application of skin protectant three times a day and after brief changes. Zhang et al. (2022) tested structured skin care guidelines that included the use of non-ionic surfactant skin cleanser, barrier spray/film to protect, and leakproof barrier cream. These guidelines varied slightly but it was evident that a consistent and standard approach to care was effective for promoting positive outcomes for clients who were incontinent. Specifically, two of these studies concluded that their standardized guidelines were effective in reducing the incidence of IAD development (Kon et al., 2017; Zhang et al., 2022), one determined it was effective in delaying the development of IAD (Zhang et al., 2022), and one study concluded their approach to care was effective in reducing skin loss due to deterioration with a higher likelihood of healing occurrences of IAD (Glass et al., 2020).

Multivariate analysis was employed in only one of these studies and determined that the use of barrier cream specifically, increased strateum corneum hydration, decreased skin pH and erythema index, all factors in preventing and treating IAD (Kon et al., 2017). This overall lack of multivariate analysis in the literature interferes with the ability to draw a direct conclusion that

any of the other products were effective on their own in the prevention and treatment of IAD. However, the evidence does support the use of comprehensive, standard care guidelines when providing nursing care to clients at risk for or who have developed IAD. The use of standard skin care regimens will provide consistency in best care practices and may improve outcomes for clients (Lee et al., 2020). The evidence suggests that these care guidelines should include common products examined in the research such as no-rinse skin cleansers, moisturizers, skin barrier and protectants, and leakproof creams to prevent and treat IAD. Before incorporating education on the use of these products into the content of the resource, it will be important to consult with Central Health's wound care consultants regarding availability of such products and the costs associated with them.

Methods to Mobilize Knowledge

The methodology used to deliver nursing education can have an influence on knowledge translation depending on the audience and focus of the material (Lakhal & Khechine, 2016). Six studies have examined the effectiveness of educational interventions on nurses' knowledge of IAD (Bates and Ercolano, 2021; Beeckman et al., 2010; Bredson et al., 2016; del Cotillo-Fuente, 2021; Gates et al., 2019; Lee & Kim, 2016). There were a limited number of relevant studies retrieved that focused primarily on IAD educational interventions, therefore two studies were reviewed that examined the effectiveness of educational interventions on nurses' knowledge of pressure injuries (PI) (Sving et al., 2017; Ursavas & Iseri; 2020). Several themes emerged from the literature and are discussed below in terms of mode of delivery of the educational resource, use of visual aids, and long-term evaluation.

Electronic Learning

According to Knowles adult learning theory (1978) adults prefer to be self-directed in their learning experiences and strive for autonomy in their education. Education strategies that include an independent or self-paced electronic learning (e-learning) aspect may be more appealing to adult learners such as nursing staff, thus these strategies were explored in the literature review. The evidence suggests that educational resources that involve e-learning are as effective or more effective than classroom type education. Three studies have evaluated methods of IAD education for nurses and other healthcare professionals that were primarily electronic in nature (Bates & Ercolano, 2021; Bredson et al., 2016; del Cotillo-Fuente, 2021). Studies either utilized interactive online learning modules (Bates & Ercolano, 2021; Bredson et al., 2016) or posting of content material online on a weekly basis for nurses to read (del Cotillo-Funete et al., 2021).

Each of these studies determined that their e-learning resources were effective for knowledge translation for nurses related to IAD or PI. Positive outcomes included that the percentage of clients at risk of developing IAD that were receiving appropriate prevention measures significantly increased after the educational intervention and that these measures were effective as the length of time between the first episode of incontinence and the onset of IAD doubled after the e-learning education (del Cotillo-Funete et al., 2021). Additionally, it was found that the percentage of clients who had existing symptoms of IAD and were receiving proper treatment strategies from the nurses who participated in the e-learning nearly doubled after implementation of the education (Bates & Ercolano, 2021).

One of these studies sought to compare the level of nurses' knowledge acquisition related to skin and wound care between the e-learning program and a classroom format (Bredson et al.,

2016). The findings determined that in some aspects of the content related to the Braden scale there was no statistical difference between the e-learning group and the classroom group. However, it was found that the e-learning group had significantly higher knowledge on PI classification than the classroom group (Bredson et al., 2016).

Overall, this body of evidence suggests that e-learning strategies are effective for the knowledge translation for nurses related to IAD. In fact, there is evidence to suggest that e-learning may be more effective than traditional classroom settings. Therefore, an e-learning method will be considered when developing this IAD education resource. Several studies complemented the e-learning resource with hard copy material, such as a badge card containing a skin care protocol and typed copies of online content. Multivariate regression analysis was not used to determine the effectiveness of these specific items, therefore they will cautiously be taken into consideration when developing the resource for this project.

In-person Learning

Five research studies sought to determine the effectiveness of traditional in-person learning session in translating knowledge related to IAD and PI to nurses (Beeckman et al., 2010; Gates et al., 2019; Lee & Kim, 2016; Sving et al., 2017; Ursavas & Iseri; 2020). The length of the in-person education sessions examined in this review varied greatly, from 50 minutes to eight hours. Two studies used one 50- 60-minute face-to-face classroom presentation to deliver content related to differentiating between IAD and PI and classifying occurrence of each condition (Beeckman et al., 2010; Lee & Kim, 2016). A single study conducted a full day in-person training for nurses related to PI prevention (Sving et al., 2017). Two studies held multiple in-person sessions on multiple days to deliver their educational material regarding IAD and PI (Gates et al., 2019; Ursavas & Iseri, 2020). Each of these studies were found to have

significant results in increasing nurses' knowledge of IAD or PI as their knowledge levels increased significantly after attending the in-person sessions. Thus, these lengths of time would be considered along with other factors such as staff availability and other time constraints, if an in-person educational resource were to be developed.

Use of Visual Aids. The use of visual aids can assist with visual perception of abstract concepts and facilitate learning (Dash et al., 2016). The evidence suggests that visual aids can be effective in knowledge translation for nurses related to IAD. Three studies included photographs and videos of healthy skin and examples of IAD and PI in their education sessions to assist with nurses' differentiation, diagnosing, and classification of IAD and PI (Beeckman et al., 2010; Gates et al., 2019; Lee & Kim., 2016). The conclusions from these studies were that the use of visual depictions was effective in increasing nurses' diagnostic abilities related to IAD and PI as testing scores were higher after the education sessions than before. In addition, Gates et al. (2019) found that the cases of IAD correctly identified on admission to the settings where the study was being implemented rose from 1% to 24% indicating nurses' identification and diagnostic skills had improved after the education session. They did not employee sophisticated analysis as this was a QI project, hence the evidence can not be interpreted in a true quantitative fashion. They did, however provide an example of a strategy that can be utilized in a project such as this one as well as a discussion of strengths, limitations, and detailed education plans, all of which are valuable to this current project.

The conclusion of the evidence supports the inclusion of visual aids, such as pictures and videos, in educational resources related to IAD to achieve effective knowledge translation for nursing staff. Regardless of the method of delivery of the educational resource developed, visual aids will be considered for inclusion in the content or presentation. This inclusion also supports

Knowles' (1978) views on adult education in that he states that the use of varied educational strategies best meets the needs of adult learners.

Long-term Evaluation of Knowledge Translation to Practice

While outcome measures that test nurses' acquisition of knowledge after an educational resource implementation are important, the true effectiveness is measured in how this knowledge is translated into their practice on a long-term basis (Mannix et al., 2017). Three studies from the literature review have used clinical indicators as evaluation methods that occur several months after the study was conducted. The timeframe for the evaluations ranged from three months to eight months post-implementation of the educational resource. Sving et al. (2017) evaluated their educational intervention at three months after implementation and found that significantly more clients on the medical-surgical units were receiving preventative care after the training than before ($p<0.001$). Similarly, Gates et al. (2019) found that four months after their study was conducted the occurrence of IAD on the surgical intensive care unit dropped from 29% before the education to 5% post-IAD education implementation (Gates et al., 2019). One study took a much longer approach in evaluating clinical outcomes of their educational strategy. del Cotillo-Fuente et al. (2021) concluded that at eight months post-implementation total incidence of all moisture-associated skin damage had significantly decreased ($p=0.003$). Although there was a slight decrease in incidence of IAD specifically, it was not found to be significant ($p=0.67$) (del Cotillo-Fuente et al., 2021).

The evidence suggests that educational resources for nurses related to IAD have a positive long-term positive impact on nursing practice. Thus, it is concluded that evaluation of an educational resource for IAD should include both acquisition of nurses' knowledge and indicators that would reveal improvement in clinical practice including a long-term follow up

evaluation. Although the direct implementation and evaluation will not be a part of this practicum project, suggestions will be made to the health authority contact to consider a clinical indicator component for evaluation at least three months-post implementation.

Conclusion

An educational strategy for nursing staff related to IAD can improve outcomes for clients by increasing knowledge on prevention, diagnosis, and management. Findings from this literature review align with the key contact of this project, Nicole Pitcher, who believed that nursing staff could benefit from an IAD resource to improve client care. Therefore, the evidence gathered from this review will guide the development of an educational resource related to IAD for nursing staff at Central Health specifically in relation to the content of the resource, such as the risk factors for IAD and best practice guidelines. Findings regarding the methods of delivery of IAD educational content will influence the methods chosen for the education resource for this project and will be used to frame the consultations with key stakeholders of Central Health.

References

Alcoforado, C., Lopes, F. O., Fernandes, R. de A., Carvalho, R. L. R. de, Guillen, M. R. S., Ercole, F. F., & Chianca, T. C. M. (2019). Knowledge of nursing professionals about dermatitis associated with incontinence and pressure injury. *Reme Revista Mineira de Enfermagem, 23*, e-1166. https://doi.org/10.5935/1415-2762.20190014

Barakat-Johnson, M., Stephenson, J., Basjarahil, S., Campbell, J., Cunich, M., Disher, G., Geering, S., Ko, N., Lai, M., Leahy, C., Leong, T., McClure, E., O'Grady, M., Walsh, J., White, K., & Coyer, F. (2022). Clinician knowledge of incontinence-associated dermatitis: A multisite survey of healthcare professionals in acute and subacute settings. *Journal of Wound Ostomy and Continence Nursing, 49*(2), 159–167. https://doi.org/10.1097/WON.0000000000000846

Bates, A. N., & Ercolano, E. (2021). Development and implementation of a simple wound care guideline for minor skin lesions: A quality improvement project. *Journal of Wound, Ostomy and Continence Nursing, 48*(4), 285–291. https://doi.org/10.1097/WON.0000000000000778

Beeckman, D. (2016). A decade of research on incontinence- associated dermatitis (IAD): Evidence, knowledge gaps and next steps. *Journal of Tissue Viability, 26*(1), 47–56. https://doi.org/10.1016/j.jtv.2016.02.004

Beeckman, D., Schoonhoven, L., Fletcher, J., Furtado, K., Heyman, H., Paquay, L., De Bacquer, D., & Defloor, T. (2010). Pressure ulcers and incontinence-associated dermatitis: effectiveness of the pressure ulcer classification education tool on classification by

nurses. *Quality & safety in health care*, *19*(5), e3-E3. https://doi.org/10.1136/qshc.2008.028415

Benbow, M. (2017). Assessment, prevention and management of skin tears. *Nursing Older People*, *29*(4), 31–39. https://doi.org/10.7748/nop.2017.e904

Bredesen, I., M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification: A randomized study. *Nurse Education Today*, *40*, 191–197. https://doi.org/10.1016/j.nedt.2016.03.008

Campbell, J. L., Coyer, F. M., & Osborne, S. R. (2016). Incontinence-associated dermatitis: A cross-sectional prevalence study in the Australian acute care hospital setting. *International Wound Journal*, *13*(3), 403–411. https://doi.org/10.1111/iwj.12322

Conley, P., McKinsey, D., Ross, O., Ramsey, A., & Feeback, J. (2014). Does skin care frequency affect the severity of incontinence-associated dermatitis in critically ill patients? *Nursing*, *44*(12), 27–32. https://doi.org/10.1097/01.NURSE.0000456382.63520.24

Critical Appraisal Skills Programme (CASP). (2018). *Qualitative research checklist.* Retrieved from https://casp-uk.net/wp-content/uploads/2018/01/CASP-Qualitative-Checklist.pdf

Dash, S., Kamath, U., Rao, G., Prakash, J., & Mishra, S. (2016). Audio-visual aid in teaching "fatty liver". *Biochemistry and Molecular Biology Education*, *44*(3), 241–245. https://doi.org/10.1002/bmb.20935

del Cotillo-Fuente, M., Valls-Matarín, J., & Sandalinas-Mulero, I. (2021). Efficacy of a comprehensive strategy to reduce moisture-associated skin damage in an intensive care

unit: A quasi-experimental study. *Intensive & Critical Care Nursing, 63,* 102964–102964. https://doi.org/10.1016/j.iccn.2020.102964

Ferreira, M., Abbade, L., Bocchi, S. C. M., Miot, H. A., Boas, P. V., & Guimaraes, H. Q. C. P. (2020). Incontinence-associated dermatitis in elderly patients: prevalence and risk factors. *Revista Brasileira de Enfermagem, 73*(Suppl 3), 1–6. https://doi.org/10.1590/0034-7167-2018-0475

Gates, B. P., Vess, J., Long, M. A., & Johnson, E. (2019). Decreasing incontinence-associated dermatitis in the surgical intensive care unit: A quality improvement project. *Journal of Wound, Ostomy and Continence Nursing, 46(*4), 327–331. https://doi.org/10.1097/WON.0000000000000540

Glass, G. F., Goh, C. C. K., Cheong, R. Q., Ong, Z. L., Khong, P. C. B., & Chan, E. (2021). Effectiveness of skin cleanser and protectant regimen on incontinence-associated dermatitis outcomes in acute care patients: A cluster randomised trial. *International Wound Journal, 18*(6), 862–873. https://doi.org/10.1111/iwj.13588

Gray, M., & Giuliano, K. K. (2018). Incontinence-associated dermatitis, characteristics and relationship to pressure injury: A multisite epidemiologic analysis. *Journal of Wound, Ostomy and Continence Nursing*, *45*(1), 63–67. https://doi.org/10.1097/WON.0000000000000390

Gray-Miceli, D. (2017). Impaired mobility and functional decline in older adults: Evidence to facilitate a practice change. *Nursing Clinics of North America*, *52*(3), 469–487. https://doi.org/10.1016/j.cnur.2017.05.002

Horntvedt, M. E., Nordsteien, A., Fermann, T., & Severinsson, E. (2018). Strategies for teaching evidence-based practice in nursing education: A thematic literature review. *BMC Medical Education*, *18*(1), 172–172. https://doi.org/10.1186/s12909-018-1278-z

Johansen, E., Bakken, L. N., Duvaland, E., Faulstich, J., Hoelstad, H. L., Moore, Z., Vestby, E. M., & Beeckman, D. (2018). Incontinence-associated dermatitis (IAD): Prevalence and associated factors in 4 Hospitals in Southeast Norway. *Journal of Wound, Ostomy and Continence Nursing*, *45*(6), 527–531. https://doi.org/10.1097/WON.0000000000000480

Johansen, E., Lind, R., Sjøbø, B., & Petosic, A. (2020). Moisture associated skin damage (MASD) in intensive care patients: A Norwegian point-prevalence study. *Intensive & Critical Care Nursing*, *60*, 1-5. https://doi.org/10.1016/j.iccn.2020.102889

Kaysar, S. A., Phipps, L., VanGilder, C. A., & Lachenbruch, C. (2019). Examining prevalence and risk factors of incontinence-associated dermatitis using the international pressure ulcer prevalence survey. *Journal of Wound, Ostomy and Continence Nursing*, *46*(4), 285-290. https://doi.org/10.1097/WON.0000000000000548

Kayser, S. A., Koloms, K., Murray, A., Khawar, W., & Gray, M. (2021). Incontinence and incontinence-associated dermatitis in acute care: A retrospective analysis of total cost of care and patient outcomes from the Premier Healthcare Database. *Journal of Wound, Ostomy and Continence Nursing*, *48*(6), 545–552. https://doi.org/10.1097/WON.000000000000818

Knowles, M. (1978). Andragogy: Adult learning theory in perspective. *Community College Review*, *5*(3), 9–20. https://doi.org/10.1177/009155217800500302

Kon, Y., Ichikawa-Shigeta, Y., Iuchi, T., Nakajima, Y., Nakagami, G., Tabata, K., Sanada, H., & Sugama, J. (2017). Effects of a skin barrier cream on management of incontinence-associated dermatitis in older women: A cluster randomized controlled trial. *Journal of Wound, Ostomy and Continence Nursing, 44(*5), 481–486. https://doi.org/10.1097/WON.0000000000000353

Kopelman, J. (2000). Obesity as a medical problem. *Nature*, *404*(6778), 635–643. https://doi.org/10.1038/35007508

Kotowski, S. E., Davis, K. G., Wiggermann, N., & Williamson, R. (2013). Quantification of patient migration in bed: Catalyst to improve hospital bed design to reduce shear and friction forces and nurses' injuries. *Human Factors*, *55*(1), 36–47. https://doi.org/10.1177/0018720812474300

Kottner, J., & Surber, C. (2016). Skin care in nursing: A critical discussion of nursing practice and research. *International Journal of Nursing Studies*, *61*, 20–28. https://doi.org/10.1016/j.ijnurstu.2016.05.002

Lakhal, S., & Khechine, H. (2016). Student intention to use desktop web-conferencing according to course delivery modes in higher education. *The International Journal of Management Education*, *14*(2), 146–160. https://doi.org/10.1016/j.ijme.2016.04.001

LeBlanc, K., Forest-Lalande, L., Rajhathy, E., Parsons, L., Hill, M., Kuhnke, J.L., Hoover, J., Lillington, T., & Cyr, M.H. (2020). Best practice recommendations for the prevention and management of moisture-associated skin damage. In: *Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada* (pp. 1-52)

https://www.woundscanada.ca/doclink/wc-bpr-prevention-and-management-of-moisture-associated-skin-damage-1949e-final/

Lee, H., Kim, D. J., & Han, J.W. (2020). Developing nursing standard guidelines for nurses in a neonatal intensive care unit: A Delphi study. *Healthcare*, *8*(3), 320–341. https://doi.org/10.3390/healthcare8030320

Lee, Y. J., & Kim, J. Y. (2016). Effects of pressure ulcer classification system education programme on knowledge and visual differential diagnostic ability of pressure ulcer classification and incontinence-associated dermatitis for clinical nurses in Korea. *International Wound Journal, 13*(S1), 26–32. https://doi.org/10.1111/iwj.12546

Mannix, T., Parry, Y., & Roderick, A. (2017). Improving clinical handover in a paediatric ward: Implications for nursing management. *Journal of Nursing Management*, *25*(3), 215–222. https://doi.org/10.1111/jonm.12462

McDonald, E. W., Boulton, J. L., & Davis, J. L. (2018). E-learning and nursing assessment skills and knowledge: An integrative review. *Nurse Education Today, 66*, 166–174. https://doi.org/10.1016/j.nedt.2018.03.011

Phipps, L., Gray, M., & Call, E. (2019). Time of onset to changes in skin condition during exposure to synthetic urine: A prospective study. *Journal of Wound, Ostomy and Continence Nursing*, *46*(4), 315–320. https://doi.org/10.1097/WON.0000000000000549

Public Health Agency of Canada (PHAC). (2014). *Critical appraisal tool kit.* http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

Rahmayanti, E. I., Kadar, K. S., & Saleh, A. (2020). Readiness, barriers and potential strength of nursing in implementing evidence-based practice. *International Journal of Caring Sciences, 13*(2), 1203-1211.

Şahin, F., Karadağ, A., & Avşar, P. (2019). A survey of Turkish nurses' knowledge of incontinence-associated dermatitis. *Journal of Wound, Ostomy and Continence Nursing, 46* (5), 434-440. doi: 10.1097/WON.0000000000000567.

Squires, J. E., Graham, I. D., Hutchinson, A. M., Linklater, S., Brehaut, J. C., Curran, J., Ivers, N., Lavis, J. N., Michie, S., Sales, A. E., Fiander, M., Fenton, S., Noseworthy, T., Vine, J., & Grimshaw, J. M. (2015). Understanding context in knowledge translation: A concept analysis study protocol. *Journal of Advanced Nursing*, *71*(5), 1146–1155. https://doi.org/10.1111/jan.12574

Strehlow, B. R., Fortes, V. L. F., & de Amarante, M. V. (2018). Incontinence-associated dermatitis in hospitalized elderly: Nurses' self-reported knowledge. *Revista de Pesquisa, Cuidado é Fundamental*, *10*(3), 801–809. https://doi.org/10.9789/2175-5361.2018.v10i3.801-809

Sving, E., Fredriksson, L., Gunningberg, L., & Mamhidir, A. G. (2017). Getting evidence-based pressure ulcer prevention into practice: A process evaluation of a multifaceted intervention in a hospital setting. *Journal of Clinical Nursing*, *26*(19-20), 3200–3211. https://doi.org/10.1111/jocn.13668

Ursavaş, F. E., & İşeri, Ö. (2020). Effects of education about prevention of pressure ulcer on knowledge and attitudes of nursing students. *Journal of Tissue Viability, 29*(4), 331–336. https://doi.org/10.1016/j.jtv.2020.06.006

Van Damme, N., Van den Bussche, K., De Meyer, D., Van Hecke, A., Verhaeghe, S., & Beeckman, D. (2017). Independent risk factors for the development of skin erosion due to incontinence (incontinence-associated dermatitis category 2) in nursing home residents: Results from a multivariate binary regression analysis. *International Wound Journal*, *14*(5), 801–810. https://doi.org/10.1111/iwj.12699

van Dishoeck, A. M., Looman, C. W. N., Steyerberg, E. W., Halfens, R. J. G., & Mackenbach, J. P. (2016). Performance indicators; the association between the quality of preventive care and the prevalence of hospital-acquired skin lesions in adult hospital patients. *Journal of Advanced Nursing*, *72*(11), 2818–2830. https://doi.org/10.1111/jan.13044

Wassel, C. L., Delhougne, G., Gayle, J. A., Dreyfus, J., & Larson, B. (2020). Risk of readmissions, mortality, and hospital-acquired conditions across hospital-acquired pressure injury (HAPI) stages in a US national hospital discharge database. *International Wound Journal*, *17*(6), 1924–1934. https://doi.org/10.1111/iwj.13482

Wound Canada. (2022). *About – Wounds Canada*. https://www.woundscanada.ca/about

Yates, A. (2020). Incontinence-associated dermatitis 1: Risk factors for skin damage. *Nursing Times*, *116*(3), 45–50.

Zhang, X., Wang, X., Zhao, X., & Zhang, Y. (2022). A structured skin care protocol for preventing and treating incontinence-associated dermatitis in critically ill patients. *Advances in Skin & Wound Care*, *35*(6), 335–342. https://doi.org/10.1097/01.ASW.0000828972.70137.8a

Appendix A Literature Summary Table

Study/design	Methods	Key Results	Comments
Alcoforado et al. (2019) Design: Cross sectional Aim: evaluate nursing knowledge about stage 1 and 2 pressure injuries (PI) and IAD	<u>Country</u>: Brazil <u>Sample:</u> • Convenience sample of 76 professionals from 4 hospital wards in one hospital • 16 registered nurses, 69 nursing technicians <u>Data collection:</u> • Questionnaire containing 18 statements in the categories of definition, evaluation, and prevention and treatment of PI and IAD • Answer: Agree, disagree, and I do not know • Data collection performed by nursing students who received training on IAD and PI <u>Analysis:</u> • Descriptive statistics • Mean of correct answers	Average score in domain: • Definition – 78.28% • Evaluation – 61.18% • Prevention and treatment – 86.81% Average score on definition domain – 78.28% Vs. Average score to question related to visual identification of IAD through images – 56.8%	Strength of design: weak Quality: Low • Response rate of 57% • Tool V but R not addressed • Participants given questionnaire to fill out and return with no timeframe listed in the study. • No professionals present on day of data collection with may have impacted the level of response.

Study/design	Methods	Key Results	Comments
Barakat-Johnson et al. (2022) Cross-sectional study Aim: to examine clinicians' knowledge of IAD using the Barakat-Johnson Incontinence-Associated Dermatitis Knowledge Tool (Know-IAD)	Country: Australia Sample: 428 healthcare professionals from 6 hospitals • 54.99% of sample were RNs • Response rate of 98.8% Data collection: • Hard copy survey • The Know-IAD • 18 items; forced choice format • Examined 3 domains: etiology and risk (E&R), classification and diagnosis (C&D), and prevention and management(P&M) • Mean knowledge score of 70% considered satisfactory Analysis: • Descriptive and exploratory analysis completed • Mean scores calculated per item and domain • P=0.05	Overall results: • 31.3% of participants achieved a 70% or more on the survey Percentage of participants that received 70% in domain: • E&R - 84.5% • C&D -16.3% • P&M -20.4% Scores by healthcare professional (score out of maximum 18 points): ($p<0.05$) • Nurses: 11.8 (2.39) • Allied health profession and physician: 10.3 (2.61) • Student: 8.96(2.10) Nursing scores by domain: ($p<0.05$) • E&R – 5.59/7 (1.00) • C&D – 2.41/5 (1.15) • P&M – 3.76 /6 (1.23)	Strength of design: Weak Quality: Moderate • V & R survey • High response rate • Limited participant data collected, and thus have reduced the understanding of confounding factors

Study/design	Methods	Key Results	Comments
Bates & Ercolano (2021) UCBA/QI project Aim: determine if both nurses' knowledge and patients' receival of appropriate treatment increased after a multimodal education strategy on wound care guidelines for minor skin lesion	Country: United States Sample: • 89/260 nurses (34%) pre intervention • 396/260 nurses (37%) post intervention • Working on acute care inpatient units in large hospital in Minnesota Intervention: • Guidelines drafted by expert knowledge/research and sent to nurses • Online module to be completed within 3 months of project • Card badge with guidelines printed on it was distributed to participants • Rounding to units by expert clinician to verbally discuss • Email sent to all participants sharing frequently asked questions and answers Data collection: • Self-evaluation survey 5 knowledge-based questions using Likert scale. • Wound documentation audits	Wound care audits revealed 45% of patients received appropriate treatment prior to education vs. 80% after education. Nurses rating of knowledge: • of what dressings and treatment to use was 18% pre- education vs. 57% post • of when to change dressings and topical treatments 27% pre- and 65% post	Design strength: Weak Quality: Low • Questions used in electronic surveys were not validated and was apparent during rounding • No sophisticated analysis completed • Low participation rate • Surveys were emailed to participants. May have contributed to low participation rate. • No control group used • Some improvements noted may have been due to better documentation not better care provided

Study/design	Methods	Key Results	Comments
Beeckman et al. (2010) RCT Aim : determine the effectiveness of PUCLAS education tool on nurses' differentiation of PUs and IAD	Country: Belgium, The Netherlands, United Kingdom and Portugal. Sample: 1217 nurses attending a wound care conference. • N=559 control group • N=658 intervention group • No significant difference between group scores at baseline The intervention: a one-hour face to face standard PUCLAS education session, including lecturing, videos and pictures. • Control group received 15min stand rehearsal of definition of PU grades in the European Pressure Ulcer Advisory Panel classification system (EPUAP) Data collection: • Collected baseline and post-education • EPUAP Outcome measures: • Ability to classify of IAD and PUs	Intervention group more likely than control group to correctly classify: • IAD pictures (OR 4.07, 95% CI 3.21- 5.15, p<0.001) • Pictures of a combination of IAD and PU (0R 2.08, 95% CI 1.73-2.50, p<0.001) Significant difference in the percentage of accurate assessments of IAD between the intervention and the control group (70.7% vs. 35.6%; p<0.001).	Strength of design: Strong Quality: moderate • Convenience sample, reduces the generalizability for results • Use of self-report questionnaires, with possible response bias • Large sample size from several countries increase generalizability of results • All participants were attending a wound care conference, likely already had a interest in wound care

Study/design	Methods	Key Results	Comments
Bredson et al. (2016) RCT Aim: develop and test e-learning program for assessment of PI risk and classification	Country: Norway Sample: 44 nurses working in acute care hospital wards and nursing homes • 21 control group • 23 intervention group • No significant differences between groups Intervention: Braden scale program & PU classification program (including IAD) presented via: • E-learning online program – intervention • Classroom format – control • Presentation of content guided by pedagogical principles: motivation, active engagement of learner, and use of concrete material to facilitate learning • Cases and images used in both methods Data collection: • Competency test for PU classification program • 3 test sets for Braden scale program • Collections occurred baseline, immediate post- (post test 1), and 3 month follow up (post test 2) Outcome measures: • Braden scores • Identification of PUs and skin conditions	No significant differences in Braden subscale scores between groups in any of the 3 tests: Fleiss' kappa -0.05 – 0.59 E-learning group had significantly higher sum scores than classroom group in for post test 1: • E-learning – 76.3% • Classroom – 60.5% No significant differences found in scores between groups for post test 2. Fleiss' kappa 0.13 – 0.29	Strength of design: Strong Quality: Medium • 13 lost from each group at 3 month follow up (<80%) • Some changes made to case pictures from post test 1 to post test 2 • Familiarity and comfort of using computer may have affected results • Small sample size, but did have significant results • Tool not V&R, but content validity assumed

Study/design	Methods	Key Results	Comments
Conley et al. (2014) CBA Aim: to determine the effect of frequency of skin care protocol on the incidence and severity of IAD	Country: United States N=99 incontinent patients or using fecal diversion or urinary catheter in a hospital setting. Control : (n=44) received skin routine every 12 hrs and as needed Intervention: (n=55) receive skin routine every 6 hours and as needed. Skin care routine : gentle cleaning with aloe vera containing cleanser, cleansing lotion, patted dry. If no erythema, a moisture barrier with silicone was applied. If erythema, skin protectant with zinc and menthol applied Data collection: • Patient chart data • Revised data collection tool based on previous study • 9-month collection period Outcome measures: • Incidence of IAD • Braden scores • Dermatitis score • Protein and albumin levels	Intervention group had statistically less moderate IAD then the control group (7.1% vs. 10.9%, $p<0.001$) No significant difference in mild and severe IAD between control and intervention groups ($p>0.05$) Intervention group had statistically more patients receiving enteral nutrition than the control group (21.8% vs 5.5%, $p<0.001$)	Strength of design: strong Quality: Weak • Some statistical differences between groups • Some nurses caring for patients did not participate in initial training, but given info in hand over • Major confounders not controlled • Tools V based on expert knowledge. • Limited generalizability due to the sample selected from a single hospital

Study/design	Methods	Key Results	Comments
del Cotillo-Fuente et al. (2021) UCBA Aim: assess impact of a comprehensive strategy on reducing Moisture associated skin damage (MASD) in an ICU	Country: Spain <u>Sample:</u> 145 patients over the age of 18 admitted to an ICU in a tertiary hospital <u>Intervention:</u> • Training program: interactive online program with content and tests posted weekly • Skin care protocol: 3M Cavilon wipes, almond oil, barrier cream • Recording system: forms used to assess risk, record preventative measures and document IAD and treatment. Data collection: • Patient chart audits Collected pre-education and 8 months post-intervention Outcome measures: • Incidence of MASD • Type (i.e. IAD) • Time of onset • Severity of lesions • Risk factors • Patient characteristics	Significant association found: • Time of onset of IAD from first episode of incontinence pre- intervention was 2 days, compared to 4 days post- ($p=0.005$) • Patients at risk received the treatment according to the protocol 33.6% pre-intervention and 81.3% post intervention ($p<0.001$) Lesions recorded on graph/patient record pre-23.8% and post- 66.7% ($p<0.001$)	Strength of design: weak Quality: Medium • Lack of randomization • Some significant differences in pre- and post- groups • Regression analysis used to adjust for confounders • Difficult to make assumption which aspect of strategy had significant impact • Lack of control group • Pre-intervention group lost 13% to follow up, post-intervention group lost 7% to follow up • Limited generalizability due to being conducted in one ICU

Study/design	Methods	Key Results	Comments
Ferrerira et al. (2020) Cross-sectional study Aim: determine prevalence and risk factor of IAD in hospitalized elderly patients	<u>Country:</u> Brazil <u>Sample</u>: 138 elderly patients admitted in two public hospitals • Mean age 77.2 +/- 9.3 years • 54.3% female, 45.7% <u>Data collection:</u> • Researcher developed tool • Data on patient characteristics, such as incontinence status, BMI and functional capacity, and Braden scores	Overall prevalence of IAD amongst patients was 36.2% Statistical significant association with IAD and : • obesity (OR=3.6% [1.2-10.4]) • high level of dependence (OR = 2.4 [1.1-5.0]) • low Braden scale (OR=6.1[1.4-26.9]) Highest prevalence for IAD found in long-term care units (50%[4])	Strength of design: weak Quality: Medium • No V&R tool, but content validity assumed based on expert involvement • Minimum adequate sample size calculated at 140 • Appropriate statistics used • Some incomplete data on records • Small sample size may have influenced significance of results

Study/design	Methods	Key Results	Comments
Gates et al. (2019) UCBA/QI project Aim: to determine if an algorithm on skin care for incontinent patients can reduce rate of IAD	Country: United States Sample: 27 of 35 RNs working on a 18-bed surgical ICU • 79 incontinent patients pre-intervention and 132 post-intervention Intervention : • Four in person, expert-led PowerPoint presentations • Focus on prevention, diagnosis, and treatment of IAD; skin care procedures and algorithm; documentation requirements • Hard copies of PP and algorithm left at nursing stations for reference • Implementation of incontinence care algorithm on unit Data collection: • GLOBBIAD instrument used to identify IAD and severity rank • Pre and post- education test developed by expert • Descriptive data on patient participants • Post-intervention data collected at 4 months Outcome measures: • Occurrence of IAD • Length of time from admission to diagnosis • Average test scores	• Occurrence of IAD decrease from 5% pre- to 29% post-intervention. =24% reduction • Average length of time from admission to development of IAD was 15 days pre- to 25 days post- intervention. • Percentage of cases of IAD identified on admission rose from 1% pre- to 24% post-intervention • Average test scores rose from 51% pre-intervention to 88% post-intervention	Design strength: Weak Quality: Low • Instruments V&R or based on expert opinion/knowledge for face validity • 77% participation rate • No sophisticated analysis completed • Lack of control group • Convenience sample • Computer reporting system lacked capability to track some data • Pre and post-intervention data difficult to compare as wound care experts determined cases of IAD in pre-stage

Study/design	Methods	Key Results	Comments
Glass et al. (2020) RCT Aim: examine the effectiveness of two different skin cleansing and protectant regimes in healing IAD and prevention further deterioration	Country: Singapore N=84 patients in 49 critical, acute, and sub-acute inpatient wards Treatment group 1 (n=23): got 3M Cavilon no-rinse skin cleanser, disposable body wipes and 3M Cavilon advanced skin protectant. Treatment group 2 (n=37): got Conveen EasiCleanse, disposable body wipes, and Conceen Critic Barrier Control group (n=24): got disposable wipes, and Conveen Critic Barrier or Secura Data collection: • Clinical assessments and photographs • GLOBIAD tool • Baseline, days 1,3,5,7 Outcome measures: • Number of episodes of IAD healing • Deterioration in skin condition • Development of skin loss	No significant differences in outcomes for each group in cases of IAD healed, deterioration, or skin loss. Patients treated with treatment 1 or 2 were 3 – 3.4 times mores likely to heal within 7 days than the control (T1 95% CI 0.34-29.17, P=0.40; T2 95% CI 0.39-29.97, p=0.40) Prevalence of IAD deterioration remained low at day 3 at 6% and skin loss at 5%.	Strength of design: Strong Quality: Medium • V&R tools • 75% of available patients were eligible • Patients loss to death, discharge, healed status or withdrawal (max 30%) • Participants similar in demographics • Study ended early due to COVID and resulted in insufficient power to reach statistical significance • Limited recruitment • Unknown if assessor was blinded

Study/design	Methods	Key Results	Comments
Gray and Giuliano (2018) Epidemiologic study Aim: to measure prevalence of IAD in acute care and associations between IAD, incontinence, immobility and sacral pressure injury	Country: United States Sample: 5342 adults from acute care facilities in 36 states. Data collection: • Form developed by clinical experts • Electronic format • Used to collect data on immobility, incontinence, case of IAD and pressure injury	Patients who were immobile were more likely to develop IAD than those who were mobile (39.9% vs 7.4%, p<0.001) The presence IAD was significantly associated with the development of sacral pressure injuries (OR 4.56, 95% CI 1.74-4.03; p<0.001).	Strength of design: Weak Quality: moderate • Tool reported as being developed by clinical experts for previous study thus content validity can be assumed based but reliability is questionable • Fields on data collection form were not mandatory and thus some were skipped • Participants did not receive standard training on IAD assessment • Large sample and multiple settings increases generalizability of results

Study/design	Methods	Key Results	Comments
Johansen et al. (2018) Epidemiologic study Aim: investigate prevalence and severity of IAD and associated factors in an acute care facility	Country: Norway Sample: 346 participants from inpatient units in 4 hospitals • 18 years and older • 53.3% male, 46.7% female Data collection: • Data collection tool designed for this study • RNs trained in skin assessment and data collection worked in pairs • Tracked via electronic charted	Prevalence of IAD in patients with incontinence was 29%. Prevalence of IAD in total population (continent and incontinent) was 7.6%. Patients 70 years and older were more likely to have IAD than younger patients (p=0.03). Impaired mobility was significantly associated with IAD (p=0.01). No statistically significant difference in IAD between medical or surgical wards (p=0.62).	Strength of design: Weak Quality: High • No significant difference in demographic data • 64.6% of those in the sample were tested. • Nurses did not examine patients from their own ward • Tool not V&R, but content validity assumed due to expert involvement • Appropriate statistics used in analysis • Did not determine interrater reliability • Measured incidence and severity of IAD on a single day only; did not look at history

Study/design	Methods	Key Results	Comments
Kaysar et al. (2019) Cross-sectional study Aim: evaluate prevalence and risk factors of IAD	Country: United States Sample: 56, 209 patients from 753 health care facilities in Canada and the United States • 13,615 (18%) were incontinent • Mean age 65 +/- 17 • 51 % female, 49% male Data collection: • International Pressure Ulcer Prevalence (IPUP) survey • Researcher developed surveys • Data on patient characteristics and characteristics of facility • Experienced surveyor collected data	Overall prevalence of IAD for entire sample was 4.3%. Prevalence of IAD for incontinent sample was 18%. IAD prevalence highest in long term care setting (9.1%) and lowest in acute care (4.1%). When compared to urine incontinence, those with FI only (OR=1.61; p<0.001), double incontinence (OR = 1.55; p<0.001), or had a fecal management system (OR=1.65; p<0.001) were more likely to have IAD. Each additional 20kg of weight significantly increased the likely hood of IAD by 7.1% (OR =1.07; p<0.001) Patients whose mobility was restricted to a bed was more likely to have IAD (OR=1.22; p<0.001) Each additional piece of linen of a patient's bed increased the likelihood of IAD by 8.3%.	Strength of design: Weak Quality: Medium • Multivariate regression analysis used • Surveyors may have different knowledge and experience related to IAD when assessing and collecting data • Tool not V&R, but content validity assumed due to expert involvement • Regression analysis showed poor measures of fit • Possible sampling bias as facilities that opted to take the IPUP survey may be more likely to track pressure injurie already

Study/design	Methods	Key Results	Comments
Kaysar et al. (2021) Retrospective cohort Aim: to evaluate prevalence of IAD and association with outcomes such as length of stay, readmission, presence of sacral pressure ulcer	<u>Country:</u> United States <u>Sample:</u> 15,793,765 patients from 937 hospitals • 235,241 were incontinent • Average age of incontinent patients vs continent patients: 71 vs 61 years <u>Data collection tools :</u> • Charleson Comorbidity Index (CCI) • Patient-defined diagnosis-related group (APR-DRG). • Demographic record • Documentation related to patient's stay in hospital <u>Outcome measures:</u> • CCI – measuring comorbidities to predict mortality or greater resources use • Length of stay(LOS) • Readmission rate • Prevalence of IAD • Prevalence of incontinence • Prevalence of sacral pressure ulcer • Cost of care	Incontinent patients with IAD were more likely to be immobile than those who did not have IAD (6.6% vs 5.5%, p=0.000) Incontinent patients who had IAD had a 3.2 longer LOS than incontinent patients who did not have IAD (9.7 days vs 6.4 days, p=0.000) Readmission rate 1.3 times higher for incontinent patients who had IAD than incontinent patients who did not have IAD (16% vs 12%, p=0.000) Patients with IAD were 2 times more likely to develop a sacral pressure injury than those who did not have IAD (1.2% vs 0.59%, p=0.000) Incontinent patients receiving treatment for IAD had significantly higher healthcare cost than incontinent patients without IAD ($22,832 vs $16,981; p=0.000)	Strength of design: moderate Quality: weak • Possible misclassification bias due to errors in coding • Data on readmission only captured if patients were readmitted to the same hospital not if to others • Due to retrospective design they were unable to determine if the incontinence or IAD created high costs • Lack of proper code for IAD may have skewed results

Study/design	Methods	Key Results	Comments
Kon et al. (2017) RCT Aim: examine effect of skin barrier cream with moisturizer and skin protectant for improving severity of IAD	County: Japan N=33 female patients in 6 wards in a long term care facility Control group: (n=15 from 3 wards) got usual care including wet towels for incontinence brief change, moisturizing and protectant skin cleanser once a day. Intervention group: (n=18 from 4 wards) got usual care, plus a skin barrier cream that acts as moisturizer and protectant 3 times a day and after brief changes Data collection: • Corneometer • Open-ended coaxial probe • VapoMeter • Skin-pH meter • Erythema Index(EI) • Melanin Index (MI) Outcome measures: • Skin pH • Hydration level of skin layers • Skin appearance characteristics	The EI in experimental group significantly lower than control at day 14 (median: 47.3 vs 57.6; p=0.004) Multivariate analysis of use of barrier cream had significant results in: - Increased strateum corneum hydration (0.443, p=0.031) - Decreased skin pH (-0.439, p=0.020) - Decreased EI score (-0.451, p=0.018)	Study design: Strong Quality: High • Groups similar at baseline • Multivariate analysis used • No loss to follow up • Assessors blinded • Possibility participant may have received wrong treatment by mistake • V&R tool • Unable to meet goal of adequate sample size to achieve significant results • Very limited generalizability due to sample being incontinent females for one long term care facility

Study/design	Methods	Key Results	Comments
Kottner & Surber (2016) Cross-sectional study Aim: identify person and health-related variables associated with the development of IAD	Country: Austria and Netherlands Sample: 3713 incontinent clients from acute care, long term care, and home settings • Data taken from larger cross-sectional study of 9992 • Mean age 74 years Data collection: • Care dependency scale • Braden scale • Data collected on incontinence and IAD factors	Patients with IAD were significantly associated with having friction and shear issues (OR 0.65%; 95% CI 0.51-0.81; p<0.05) High BMI significantly associated with presence of IAD (OR 1.05 95% CI 1.02-1.07; p=0.002) Lower scores on care dependency scale significantly associated with presence of IAD (p <0.05 for all items on scale)	Strength of design: moderate Quality: Medium • Some differences in incontinent and continent group • Participants were self-referred and thus possible selection bias • Assessors were trained in data collection process • 36.6% of eligible participants agreed to participate in the study • Due to cross-sectional nature, unable to draw a causative conclusion

Study/design	Methods	Key Results	Comments
Lee and Kim, (2016) UCBA Aim: Evaluate the effect of pressure ulcer classification system education on nurses' knowledge and diagnostic ability of pressure ulcer (PU) and IAD	Country: Korea Sample: 407 nurses working in hospital setting and interested in PU management education Intervention: • 50-minute lecture • Use of case studies • Use of visual depictions Data collection: • PU classification system and IAD knowledge test (PUCS&IAD KT). 19 item tool • Visual differential diagnostic ability test of PU classification and IAD (VDDAT-PUCS&IAD) Outcome measures: • Classification of PU • Degree of knowledge of PU and IAD	Significant difference in mean test scores of: • VDDAT-PUC&IAD before (51.3%) and after implementation (75.7%) of the education program (t=-21.11, p<0.001) • PUCS&IAD KT before 72.34% and after 83.59% (t=-11.437, p<0.001) • Visual diagnostic ability of IAD before 72.3% and after 87.4% (t-3.14, p<0.05)	Strength of design: Weak Quality: Low • Convenience sample used • Use of self-report questionnaire • V&R tools • No control group used • No use of randomization

Study/design	Methods	Key Results	Comments
Phipps et al. (2019) UCBA Aim: evaluate impact of incontinence on skin's moisture barrier and risk for IAD	Country: United States N= 30 women 65 years or older. • Conducted in research facility Intervention: all participants wore disposable incontinence pad that was filled with 400ml of synthetic urine and lay in a bed for 4 hours • Assessments of skin occurred at: baseline (prior to wetting), 15min, 30min, and 1,2, and 4 hours post exposure Data collection: • Bioinstrumentation measurements Outcome measures: • Skin hydration • Skin pH • Erythema level	Significant increase in mean moisture content of skin after 15 min of exposure compared to baseline (46.19 +/- 22.1 to 1845.2.8 +/- 542.7; $p<0.001$), and every other time point; $p<0.001$ Significant increase in skin pH 15 min post exposure from baseline (5.67 +/- 0.5 to 6.25 +/- 0.1; $p<0.001$) and every other time point; $p<0.001$ Significant increase in static friction from baseline to 4 hours post exposure (0.32 +/- 0.01 vs. 0.47 +/- 0.03; $p<0.00001$) Significant increase in erythema from baseline at all time points ($p<0.005$) Significant increase in participant-assessed discomfort from baseline at all time points ($p<0.005$)	Strength of design: Weak Quality: Medium • Baseline characteristics of participants were not similar or not recorded at all • No control used • V&R tools • Limited time frame for data collection • Use of healthy participants rather than acutely or chronically ill

Study/design	Methods	Key Results	Comments
Sahin et al. (2019) Cross-sectional study Aim: to determine the knowledge of IAD among nurses in intensive care units (ICU)	Country: Turkey Sample: 126 LPNs and RNs from 6 ICU units in a 550-bed academic research hospital Data collection: • Survey called "Data collection form for determining the IAD knowledge levels of nurses" • 59 knowledge statements, under the headings skin structure & function(S&F), definition & etiology(D&E), diagnosing, classification & evaluation(C&E), and prevention & treatment(P&T) • Wrong and "no knowledge" answers were tallied together Analysis: • Descriptive statistics • Mean scores calculated • P<0.05	-Mean correct responses: 33.05 +/- 10.16 (max 59). -Mean score of nurses who had IAD related training post-graduation (8.45 +/- SD 5.51) was significantly higher than those who did not (32.03 +/- SD 10.53), p<0.05. -Knowledge levels on prevention and treatment of IAD higher among nurses with masters (40.67 +/- 4.32), and lower among LPNs (29.12 +/- 10.08), p<0.05. *Questions with lowest correct answer by nurses: -IAD is considered stage 1 IAD if skin integrity is impaired (19.84%) (diagnosing) -IAD is different skin lesions, such as razor rash or perineal rash (26.98%) (D&E) -Natural moisturizer in corneocytes help skin maintain oil level (3.97%) (S&F) -Edges of affected region of IAD are defined (16.67%) (C&E) -Products used to contain moisture should be used for hyperhydration/maceration (17.46%) (P&T)	Strength of design: Weak Quality: Moderate • No accurate response rate calculated • Tool not confirmed as V & R, but was based on literature and expert opinion • Appropriate statistical analysis used • Limited generalizability due to sample taken from one facility

Study/design	Methods	Key Results	Comments
Strehlow et al. (2018) Design: Exploratory Purpose: to identify self-reported knowledge nurses have concerning IAD preventions, diagnosis and treatment in hospitalized elderly patients	Country: Brazil Sample: 14 nurses who worked in a large hospital in Brazil. • 10 women; 4 men • Majority worked >6yrs • Worked on surgical units, emergency department, cardiac units Data collection: • Semi structured interviews • Open and closed ended questions • Participants had opportunity to discuss the topic • Data was audio recorded and then transcribed Methods: • Transcripts were analyzed using thematic analysis • Explored material common categories in the data • Interpretations based on scientific readings	Data analysis organized in three categories: 1.Admission of elderly and IAD prevention • Majority of admissions are elderly • Assessed on admission and recognize if at risk for IAD • Awareness of prevention measures re. incontinent patients 2.Diagnosis of IAD in elderly • Nurses recognize signs of IAD • Not aware of 2 different categories of IAD • Impair effective treatment 3.IAD treatment • Not aware barrier cream not recommended to treat mod – severe IAD • Reported lack of knowledge • No consistency on care practices with relation to IAD	Quality: trustworthy Limitations: • Participation linked to employment; maybe felt obligated • Researcher's own role in research not made clear; possible bias/influence • No discussion of triangulation

Study/design	Methods	Key Results	Comments
Sving et al. (2017) UCBA Aim: evaluate effectiveness of multifaceted intervention based on evidence-based PI prevention had on rate of PI prevention, incidence of PI and nurses' knowledge and attitude towards PU prevention	<u>Country:</u> Sweden <u>Sample:</u> • Patients: 506 adults admitted to med-surg units (255 in pre-test group; 255 in post-test group) • Registered and assistant nurses on 3 med-surg units (145 pre-test; 130 post-test) <u>Intervention:</u> 1 day training for registered nurses about knowledge on PU awareness, evidence-based practice re. PU prevention, with monthly quality measurements with feedback completed by first-line manager <u>Data collection:</u> • Data collection tool outlined by European Pressure Ulcer Advisory Panel (EPUAP) • Modified Norton Scale • Data collected on three different days at 2 week intervals (pre and post) • Pressure Ulcer Knowledge Assessment Tool (PUKAT) • Attitudes towards Pressure Ulcer (APuP) scale <u>Outcome measures:</u> • Receival of PU preventative care • Level of risk for PU • Nurses' knowledge of PU prevention • Nurses' attitude of PU prevention	Significant more preventative care provided to patients post-intervention (p=0.002). No improvement in : • Prevalence of 1-4 PU at post test (11% vs 11%, p=0.887) • Prevalence unit-acquired PU (9% vs 8.4%, p=0.762) Nurses' knowledge about PU prevention was significantly greater post-intervention (63% vs 57%, p=0.001) No significant differences in any areas of attitude scores pre vs post intervention.	Strength of design: Weak Quality: Weak • Use of convenience sampling • Lack of control • >80% agreed to participate in the study • A skin expert nurse completed all skin assessments. • Post tests were handed out to nursing staff and they handed them back to research department at the hospital, thus information bias may have occurred

Study/design	Methods	Key Results	Comments
Ursavas and Iseri (2020) Quasi-experimental Aim: to evaluate the effects of education about pressure ulcer prevention on knowledge and attitudes of nursing students	<u>Country:</u> Turkey <u>Sample:</u> 96 second year nursing students N=53 control group who did not take a wound ostomy incontinence nursing course N=43 intervention group who was taken a wound ostomy incontinence course; received four weeks of education • Due to loss n= control group was 42; n=42 intervention group Intervention: 4 sessions, 2 hours each week • Knowledge on wounds and wound assessment/complications, wound care products, PU and staging, and evidenced based practice on PU prevention and treatment • PowerPoints, group work, visual aids, videos, discussion of relevant research studies. Data collection: • The Pressure Ulcer Prevention Knowledge Assessment Instrument (PUPKAI-T) • Attitude Towards the Pressure Ulcer prevention Instrument (APuP) • Control and intervention groups had data collected at the same time. • Collected post-intervention only	Overall mean PUPKAI-T scores significantly higher in the intervention group than the control group (63.00 +/- 16.7 vs 39.35 +/- 9.77, $p<0.05$). Overall mean scores of APuP differed significantly from intervention to control group (85 +/- 8.7 vs 81.08 +/- 6.98, $P<0.05$) Mean scores of nurses' attitudes towards effectiveness of prevention did not significantly differ between intervention and control group (88.05 +/- 9.13 vs 87.20 +/- 11.21, $p<0.05$)	Strength of design: Weak Quality: Weak • No significant differences in control vs intervention group • Loss of 21% of participants of control group • No pre-test conducted thus no baseline • Students enrolled themselves into the study which could create selection bias

Study/design	Methods	Key Results	Comments
Van Dishoeck et al. (2016) Case-control study Aim: explore relationship between development of IAD and PU and preventative care processes	Country: Netherlands Sample: 132 patients from 24 inpatient units • 44 cases, 88 controls • 1:2 case to control Data collection: • Patient report records • Audits Outcome measures: • PU risk score • Number of cases of IAD and PU • Quality of nursing care score: calculated by risk assessment, patient information, repositioning, heel prevention, alternating mattresses, incontinence prophylaxis, adequate nutrition, skin assessment, non-recommended interventions.	Quality of care score (p=0.032) and PU risk score (p=0.018) significantly associated with occurrence of IAD and PUs. Odds of developing IAD or PU nearly doubled when the quality of care worsened by 1 point.	Strength of design: Moderate Quality: High • Blinded assessors • Regression analysis used • Calculation done to find appropriate sample size • Tools have content validity based on expert opinion/knowledge • Underreporting of preventative measures limited data • Some data collected using nurses' recall possibly causing errors in data • Possible misclassification of PUs

Study/design	Methods	Key Results	Comments
Van Damme et al. (2017) Cross-sectional study, as part of a larger RCT Aim: identify characteristics associated with higher risk of developing IAD	Country: Belgium Sample: 381 residents from 11 nursing homes • Mean age 85.3 years old • 79.5% female, 20.5% male Data collection: • Pressure Ulcer Classification Set (PUCLAS3) • Data collected at baseline and daily • Braden scale • BESADL • Charlson Comorbidity Index • Mini-nutritional Assessment	Significant association between the development of IAD and: • Low levels of mobility (OR 2.72, 95% CI 1.06-6.94, $p<0.05$) • Friction and shear issues (OR 2.54, 95% CI 1.02-6.33, $p<0.05$)	Strength of design: Weak Quality: High • Use of V&R tools • Multivariate regression analysis used • Appropriate use of statistics • Results maybe generalizable for other nursing homes since sample chosen from multiple facilities

Study/design	Methods	Key Results	Comments
Zhang et al. (2022) CBA Aim: determine effectiveness of structured skin protocol for prevention and treating IAD in critically ill patients	Country: China N=143 adult patients with fecal incontinence in ICUs from 3 hospitals Control: (n=64) received standard skin care protocol; warm water baths and topical cleansing with water when incontinent and qshift skin assessments by nurse Intervention: (n=78) received new structured skin routine in addition to standard protocol; examples, use of non-ionic surfactant skin cleanser, saline to clean wounds, skin barrier spray/film to protect, hydro colloid dressings, leakproof cream Data collection: • Researcher developed form to collect patient data, including demographics/clinical data and IAD related data • Modified Barthel Index, Acute Physiology and Chronic Health Evaluation II, Braden Scale, Nutrition Risk Assessment, Bristol Stool Scale, Perineal Assessment Tool, IAD severity Tool Outcome indicators: • Incidence of IAD • Time to IAD development • Nursing time for skin care related to incontinence • Severity of IAD	Statistically significant difference in incidence of IAD between control group (35.9%) and intervention group (17.7%), $p<0.05$. Length of time to develop IAD in intervention group was significantly longer than control ($z=-2.116$, $p<0.05$) Structured skin protocol caused significant decrease in the severity of IAD ($z=-2.116$, $p<0.05$) No significant difference in length of nursing time devoted to incontinence or IAD between the two groups ($t=-0.258$, $p>0.05$; $t-1.190$, $p>0.05$)	Strength of design: Strong Quality: Medium • No significant differences between groups • Lack of randomization of treatments • Assessor not blinded, possible control of information bias • Some tools not proven V&R, but based on expert knowledge • All retained for follow up

Appendix B: Environmental Scan Report

Stephanie Buffett

The assessment and monitoring of a client's skin integrity is an essential aspect of nursing care to ensure early detection and diagnosis of significant findings. Incontinence-associated dermatitis (IAD) is an example of impaired skin integrity that can occur in any health care setting and can have negative complications for clients' health and well-being. A review of the literature supports that nursing staff must implement prevention and management strategies for clients to effectively prevent and manage occurrences of IAD and to do so they must be knowledgeable regarding prevention, diagnosis, and treatment procedures related to IAD. Central Health does not currently have an educational resource for nursing staff specifically focused on IAD to assist with knowledge translation and to guide practice, therefore I will develop such a resource during this practicum project. Informal discussions held with the lead wound care consultant for the health authority revealed that there was a need for a IAD specific resource to be created for nursing staff. Therefore, a literature review was conducted which supported the belief that nurses benefit from an accessible educational resource related to IAD. The literature review was also utilized to identify evidence-based practices related to IAD and explore methods of delivery that could be utilized for the development of a resource. Common themes within the findings of the literature review were also examined in this environmental scan to verify relevancy of the data and ensure it was consistent with the objectives of the practicum project.

The environmental scan was conducted to determine if there were any existing educational resources related to IAD being utilized by other provincial and national health authorities or special interest groups. An additional purpose of the environmental scan was to assist with the analysis of identifying the best possible format, implementation process,

evaluation measures, and common content themes to help guide the development of an IAD educational resource for the nursing staff of Central Health.

Methods

The environmental scan was completed in two parts. First, contact was made with wound care consultants within the province's regional health authorities to identify existing resources related to IAD being utilized to educate nursing staff in Newfoundland and Labrador. Secondly, an internet search was conducted to identify educational resources related to IAD from health authorities, provincially and nationally, and special interest groups. The purpose for and methods used for consulting provincial wound care consultants and the internet search conducted are provided in detail within this report. The data collected from the environmental scan was assessed using content analysis to identify recurring themes that could provide information essential to the development of an education resource for nursing staff related to IAD.

Wound Care Consultants

The key contact for this project, Nicole Pitcher, lead wound care consultant/Nurse Specializing in Wound, Ostomy and Continence (NSWOC) for Central Health, provided insight into the project and suggested I connect with the province's wound care consultants. The purpose of contacting these nurses was that as staff who are responsible for the development and/or implementation of educational material related to skin and wound care, they would be the most informed regarding the existence of IAD resources. The webpages of the wound care consultants' respective regional health authorities were also scanned for IAD related resources to complement the information provided in their responses. For the consultants who did not participate, I completed a scan of their regional health authorities' webpages to assess

information related to IAD education to ensure that all possible locations were included in the environmental scan.

Methods. Nicole Pitcher provided contact information for wound care consultants from three provincial health authorities. The education, titles, and roles of these staff are varied, but each nurse is involved in wound care consultations in their respective health authority. Emails were sent to the five contacts asking for their participation in the environmental scan. These included three nurses from Eastern health: one clinical nurse specialist, one skin and wound care consultant and one skin and wound care consultant/NSWOC; one skin and wound care consultant/NSWOC from Western Health; and a NSWOC from Labrador-Grenfell Health. I received an email response from only one out of the five contacted after five days. On the sixth day, I attempted to follow-up via telephone call with the remaining four nurses who had yet to respond to the initial email. A voicemail was left with three nurses, and I was unable to make contact with the fourth nurse via telephone as I was unable to locate a current telephone number for them. Three of these nurses responded much later and information obtained was included in this report. Therefore, a total of four responses were obtained from the five wound care consultants that were contacted for the environmental scan.

Results. Responses were received from four of the five wound care consultants who were contacted from the regional health authorities that resulted in the identification of seven relevant resources that contained knowledge about IAD. One participant connected via telephone conversation and followed up after our discussion with an email. The remaining three participants responded with feedback solely through email.

Participant one was a skin and wound care consultant within Eastern Health who was able to identify several educational resources that exist within the health authority that contain

content on IAD. They stated that there were no resources specifically focused on IAD but rather that IAD is discussed within a pressure injury (PI) prevention presentation during an in-person orientation for newly hired staff in long-term care. Within the presentation the content related to IAD included a definition, the differentiation from PI, and IAD prevention and management strategies. Secondly, she identified that a provincial wound care pocket guide exists for use in all health authorities which briefly covers similar IAD content with visual aids and written material. Lastly, they reported that there are resources dedicated to wound care available on Eastern Health's internal electronic system which is called the mini web. However, they admit that the resources contain little information regarding IAD. The participant stated that each of the resources identified are designed for all disciplines of direct healthcare providers. Additionally, it was stated that they are in the process of developing an electronic learning module for the authority's learning management system (LMS) related to PI prevention and that this module will include content on IAD specifically including a definition, distinguishing from PI, and prevention and management strategies in conjunction with PI.

Participant 2 was a clinical nurse specialist from Eastern Health who also referenced the mini web as being a source of educational information on skin and wound care. Specifically, they reported that it includes education on how to distinguish between IAD and PI. Additionally, they developed an educational tool related to IAD which is printed on Kardex and placed in binders for nurses working in the intensive care unit (ICU). The educational tool sheets include pictures of IAD for identification and written information on treatment measures.

Participant 3 was from a skin and wound consultant/NSWOC from Eastern Health who did not provide any information regarding IAD resources from their health authority but rather suggested that I connect with the participants counterpart in long-term care who generally

conducts education on IAD. Coincidently, the counterpart they referenced had already been consulted for this scan and their responses are included in this report. Participant 3 did provide me with information regarding a webinar that was being held by Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC) regarding moisture-associated skin damage (MASD), including IAD, and sent me a registration link for the webinar. The webinar will be discussed in the internet search section of the report as independent research was completed to explore this resource.

Participant 4 was a NSWOC from Labrador Grenfell Health who identified the wound care pocket guide previously mentioned by participant 1, as a source of information for nursing staff related IAD. However, they were able to elaborate on further details about the format of the guide and distribution in her region. They reported that a hard copy pocket guide was provided to all nursing staff in their region and an electronic copy was uploaded to the authority's internal electronic system for all staff to access. They also reported that they had just began to develop PI prevention material for staff, patients, and families but did not have anything tangible they could share at present. Their plan for the material is to focus on PI prevention, but they will also include a definition of IAD and differentiate between the two.

For the remaining contacts who did not respond, their respective health authority's webpages were scanned for relevant resources. The scan of the webpages yielded no education strategies related to IAD, although it is noted that each health authority has their own LMS for educational material that requires an employee account to access. Therefore, for this scan it is unknown if any relevant resources exist on a LMS from other sites as I could not access this resource myself. Detailed result findings can be found in Appendix A of this report.

Provincial and National Search

An internet search was conducted to identify any existing provincial and national educational resources related to IAD that could inform the development of an educational resource for nursing staff of Central Health.

Methods. The internet search engine Google was used to conduct a search of educational resources within Canada. The key search terms “incontinence-associated dermatitis”, “IAD”, “education”, “resource”, “Canada” and “nurses” were used to facilitate the search for educational resources related to IAD for nursing staff.

Results. Limited resources that primarily focused on IAD were identified, therefore resources in which content included sections on IAD were included in the scan. Eight relevant resources in total were identified from two provincial organizations and two national organizations. The results of this scan are summarized in Appendix B of this paper.

The Registered Nurses Association of Ontario (RNAO) has developed an online webinar titled “IAD and Skin Frailty” as an installment in their “Wisdom in Wound Care” webinar series for registered nurses (RNAO, 2022). The content of the webinar is based on evidence-based practice to influence optimal client-centered outcomes related to the prevention of IAD and identifying factors that contribute to the development of IAD. They have also developed a tool to be used in long-term care called the “Incontinence - Associated Dermatitis Intervention Tool (IADIT)”. The one-page tool includes pictures, definitions, and description of the classes of IAD, and detailed interventions based on best practice guidelines (RNAO, 2008). This resource is to be reviewed independently and is available for download and/or print.

Connecting Learners with Knowledge (CLWK), British Columbia's provincial skin and wound care committee, have developed a guideline summary for healthcare professionals to prevent and manage MASD, which includes IAD. This resource is a one-page step-by-step guideline for the prevention and management of MASD consisting of written descriptions and visual depictions (CLWK, 2019). This resource is available to be reviewed independently and can be downloaded and/or printed.

Four relevant resources related to IAD were retrieved from Wounds Canada's webpage. One of these resources is the "The Skin and Wound Care for Unregulated Care Providers" an electronic learning resource for unregulated health care professionals that consists of seven modules requiring 3.5-5 hours to complete and one four-hour webinar (Wounds Canada, n.d.-a). The focus of the content is skin health, wound management, and preventative measures for skin breakdown related to MASD, including IAD. There is a seventy-five-dollar fee associated with registration for this learning resource.

The "Focus on the Prevention and Management of Moisture-associated Skin Damage: Knowledge Program" is an educational resource developed by Wounds Canada intended for nurses and allied health professionals consisting of two online modules and a live webinar (Wounds Canada, n.d.-b). The material included in this program is based on best practice guidelines related to prevention and management of MASD, including IAD. During the live webinar healthcare professionals practice application of the knowledge through the completion of case studies and live polling. There is an application process for this educational program and has a fifty-dollar cost associated with registration.

Wounds Canada has also developed the "Best Practice Recommendations for Prevention and Management of Moisture-Associated Skin Damage", as one section of a larger online guide

encompassing best practice guidelines on multiple topics related to skin and wound care. It is available to download or print and targets all front-line clinicians, students, and policy makers (LeBlanc et al., 2020). This resource presents best practice guidelines related to MASD, including IAD to support the application of best practice within healthcare. The information in the resource is laid out in a step-by-step format intended to be reviewed independently, with pictures to aid with differentiation and classification of IAD. There is no cost to download, save, or print this particular section of the guide but there is a cost associated with downloading the guide as a whole document.

Lastly, Wounds Canada holds wound care conferences on a regular basis that consists of multiple sessions focused on skin and wound care related topics led by expert presenters. In 2018, MASD was the focus of one of the in-person sessions presented at their conference by three expert clinicians. The content of the sessions included assessment, classification, prevention, and management of MASD, which included IAD. A summary of this content is available in a document on the Wounds Canada webpage (Wounds Canada, 2018). No information was found regarding a registration fee for this conference, however if participants were travelling to attend they would likely incur costs.

NSWOCC recently held an online webinar for registered nurses with a focus on MASD, including IAD. Content of the webinar included skin and wound challenges, the relationship between MASD and wound development, and appropriate products to use for treatment (NSWOCC, 2022). There was a registration process to attend but no costs associated. The webinar was recorded and sent to registered participants and can also be viewed by anyone on the NSWOCC webpage.

Ethical Considerations

The Health Resource Ethics Authority Screening tool was used to determine whether ethical approval would be required for the environmental scan and results indicated that it was not necessary to obtain ethical approval. The completed screening tool can be found in Appendix C of the report. Every opportunity was taken to ensure the rights and privacy of the healthcare professionals who were contacted for the environmental scan were maintained. An email was drafted outlining the purpose of the scan, the expectations of their participation, and how the data collected would be handled. They were informed that if they responded with information regarding resources that this implied consent to participate. Names are excluded from this report to ensure confidentiality and anonymity. Also, the data collected on educational resources from the internet search was public knowledge and thus did not require consent to view or save. All sources were appropriately referenced where applicable.

Analysis

Once retrieved, the data from the environmental scan was reviewed for recognition of common themes amongst the resources related to IAD. Four of the five wound care consultants who were contacted regarding IAD resources responded with valuable information about resources in their areas. This information is included in the analysis along with the data derived from the internet search of provincial and national strategies. Collectively, data was analyzed to identify common themes that could have implications for the development of an educational resource for nursing staff related to IAD.

Method of Delivery

Electronic education was a common method utilized to educate nurses and healthcare professionals about IAD. Three organizations utilized resources that included live or online webinars to mobilize knowledge to nurses and other healthcare clinicians. Two of the webinars were recorded and archived for future viewing of registered participants only, while another webinar was recorded and made public on the organization's webpage. Online learning modules were included as components in four of the educational resources retrieved, which were self-paced in nature.

An in-person lecturing format was used in two IAD educational strategies for nursing staff retrieved from the scan. MASD and IAD were the topics of focus for one session of a national conference for nurses. This was a sit-down format with lectures from three separate expert presenters. Additionally, Eastern Health routinely conducts an in-person group orientation for newly hired staff in long-term care whereby they include education on PI and IAD prevention and treatment.

Four organizations developed written literature as an educational tool for nurses and other healthcare professionals regarding best practice guidelines related to IAD. The resources used written text organized into charts and was supplemented by pictures for visual aids. These resources are available on their webpages for bookmarking, downloading, and printing and were intended for healthcare professionals to read independently. As well, Eastern Health utilized an educational pocketbook and a Kardex to be placed in nursing binders as educational tools containing content on IAD for nurses. Knowles (1978) theory of adult education suggests that adult learners prefer to utilize self-directed learning methods instead of traditional lecturing style. This supports the use of educational tools such as the practice guidelines and pocketbook guides

that are intended for independent review, therefore these method of delivery will be considered for use for the project development if it is supported by the consultations.

Content

Several themes emerged from the data collected from the environmental scan regarding the content of the educational resources. Only two of the resources were specifically focused on IAD knowledge, while the others included IAD as a smaller component of their strategy. For example, the topic of several resources focused on PI and included brief IAD content. This reveals a lack of focused educational strategies for nurses related specifically to IAD.

Most resources took a similar approach on the IAD content. Themes included risk factors, preventative measures, and treatment and management strategies. In many of the resources this information was laid out in a clear, concise chart-like format for simplicity and clarity. This layout will be considered for utilization for the education resource developed for Central health if the findings from the consultations support it.

Interestingly, several educational strategies included instruction on promotion of continence and reversal of incontinence, however these strategies were not well highlighted in the literature. Promoting continence as a prevention measure of IAD may be approached in the future consultation process with Central Health's wound care consultants to obtain clarity and further information.

Evaluation

Overall, it was noted that the resources from the environmental scan had limited evaluations associated with them. There were no evaluation measures connected to any of the written material retrieved from the organizations. Additionally, there were no discussions

regarding any type of evaluation for the in-person conference session, webinars, or one of the online module/webinar combination resources. One resource that utilized an online module and webinar approach identified that they used a 20-question online exam to test participants retention of knowledge that required a grade of 60% to successfully pass the course. The specifics of the exam were not provided on the organization's webpage. A second module contained case studies and questions throughout but was used for staff to assess their own knowledge and not for formal evaluation purposes. Most organizations did identify the expected learning outcomes for participants during their learning strategy but had no way to evaluate the success of these outcomes therefore unable to determine knowledge acquisition. This environmental scan provided little support in identifying effective evaluation measures for the resource being developed for this project.

Limitations

Through analysis of the data related to the educational resources identified, several common limitations were identified. All electronic learning strategies, including online modules or webinars, were limited by participant requirements of having comfort and knowledge with computers, having appropriate hardware and software, and having required internet access. Additionally, provincial LMS systems do not have the ability to track participation of online modules, therefore there is no way for educators or managers to identify if staff are completing relevant education on IAD.

In-person strategies were limited by the requirement of participants to attend the sessions at a particular location and time. While no data was available regarding registration costs of these sessions there may have been costs associated with travelling and/or accommodations. Time constraints of staff may have impacted the participation in these educational sessions. As well,

each session would have a limited number of seats available, therefore not all of those who may have been interested would have been able to attend.

Written educational material available online related to IAD could possibly reach the highest number of healthcare individuals, however staff must be aware of the existence of these resources and take onus to retrieve the documents and review themselves. Additionally, there is no way to determine knowledge acquisition through an evaluation measure.

The identified limitations will be considered as barriers to effective educational strategies when developing an educational resource for nursing staff related to IAD. The benefits and limitations will be discussed with Central Health's wound care consultants when they are consulted for the practicum project.

Implications

The results of the environmental scan will have implications for the development of an IAD educational resource for nursing staff. The methods used to deliver the IAD education varied greatly from independent reading material to face to face lecturing. The limitations of the resources have been identified in this report and will be taken into consideration for developing an education resource related to IAD for nursing staff of Central Health. A decision regarding the method of delivery chosen for the educational resource related to IAD for nursing staff will be made based on the information from this scan, the literature review and recommendations from the wound care consultants during consultations. The content of the resources were consistent and generally included knowledge on best practice guidelines related to identification of risk factors and measures to prevent and treat IAD. Therefore, these main topics will be the focus of the educational resource developed for this project. Consistent with the literature

review, visual aids were commonly used in the educational resources found in this scan, to assist with identification and classification of IAD. Therefore, visual depictions will be considered for utilization in the educational resources developed for nurses at Central Health. The evaluation component of educational resources retrieved was lacking, thus could not aid in suggesting an evaluation plan of this project. The overall findings of this environmental scan will be used to guide consultations with key stakeholders in the development of an educational resource for nurses related to IAD.

Conclusion

IAD is a prevalent concern for clients in all healthcare areas. Due to the negative impacts that this condition can have for clients and the healthcare system it is nursing staffs' responsibility to employ measures aimed to prevent and treat IAD. Therefore, nursing staff must be knowledgeable about best practice evidence to identify at risk clients, institute appropriate prevention measures, and employee management strategies when IAD occurs. A provincial and national environmental scan conducted through consultation with specialists in other regional health authorities and a thorough internet search revealed information regarding existing educational resources for nursing staff related to IAD. The responses from wound care consultants were collected and combined with data retrieved from an internet search of resources across the province and the country. Content analysis of the findings revealed commonalities and limitations of the educational resources. The findings from this report will guide consultations with key stakeholders and will be taken into consideration when developing the educational resource for nursing staffing related to IAD.

References

Connecting Learner with Knowledge (2019). *Guideline summary: Prevention & treatment interventions for moisture-associated skin damage (MASD).* https://www.clwk.ca/get-resource/moisture-associated-skin-damage-masd-2/

Conley, P., McKinsey, D., Ross, O., Ramsey, A., & Feeback, J. (2014). Does skin care frequency affect the severity of incontinence-associated dermatitis in critically ill patients? *Nursing, 44*(12), 27–32. https://doi.org/10.1097/01.NURSE.0000456382.63520.24

Ferreira, M., Abbade, L., Bocchi, S. C. M., Miot, H. A., Boas, P. V., & Guimaraes, H. Q. C. P. (2020). Incontinence-associated dermatitis in elderly patients: Prevalence and risk factors. *Revista Brasileira de Enfermagem, 73*(suppl 3), 1–6. https://doi.org/10.1590/0034-7167-2018-0475

Gray, M., & Giuliano, K. K. (2018). Incontinence-associated dermatitis, characteristics and relationship to pressure injury: A multisite epidemiologic analysis. *Journal of Wound, Ostomy and Continence Nursing*, *45*(1), 63–67. https://doi.org/10.1097/WON.0000000000000390

Kayser, S., Koloms, K., Murray, A., Khawar, W., & Gray, M. (2021). Incontinence and incontinence-associated dermatitis in acute care: A retrospective analysis of total cost of care and patient outcomes from the Premier Healthcare Database. *Journal of Wound, Ostomy and Continence Nursing*, *48*(6), 545–552. https://doi.org/10.1097/WON.0000000000000818

LeBlanc, K., Forest-Lalande, L., Rajhathy, E., Parsons, L., Hill, M., Kuhnke, J. L., Hoover, J., Lillington, T., & Cyr, M. H. (2020). *Best practice recommendations for the prevention and management of moisture-associated skin damage.* https://www.woundscanada.ca/docman/public/health-care-professional/bpr-workshop/1814-wc-bpr-prevention-and-management-of-moisture-associated-skin-damage-1949e-final/file

Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC). (2022). *Maintaining skin integrity: Moisture associated skin damage (MASD) and wound prevention.* https://www.nswoc.ca/event-details/maintaining-skin-integrity-moisture-associated-skin-damage-masd-and-wound-prevention

Registered Nurses Association of Ontario. (2008). *Incontinence-associated dermatitis intervention tool.* https://ltctoolkit.rnao.ca/sites/default/files/resources/continence/Continence_EducationResources/IADIT.pdf

Registered Nurses Association of Ontario. (2022). *Wisdom in wound care.* https://rnao.ca/events/wisdom-in-wound-care

Wounds Canada. (2018). Wounds Canada fall conference: Exploring integrated wound management. *Wound Care Canada*, *18*(2), 26-44. https://www.woundscanada.ca/docman/public/wound-care-canada-magazine/2018-vol-16-no-2/1338-conference-session-summaries/file

Wounds Canada. (n.d.-a). *Skin and wound care for unregulated care providers (C100MWN) - online version.* https://www.woundscanada.ca/future-students-2021/future-

students/unregulated-care-providers/251-the-learning-institute/courses-programs/online-courses/375-skin-and-wound-care-for-unregulated-care-providers-c100mwn

Wounds Canada. (n.d.-b). *Focus on the prevention and management of moisture-associated skin damage: Knowledge (A109MWN).* https://www.woundscanada.ca/future-students/251-the-learning-institute/courses-programs/online-courses/432-focus-on-the-prevention-and-management-of-moisture-associated-skin-damage-knowledge-a109mwn#:~:text=Based%20on%20the%20content%20of%20the%20Wounds%20Canada,management%20knowledge%20of%20nurses%20and%20allied%20health-care%20professionals

Appendix A: Table for the results of the environmental scan with wound care consultants

Findings from environmental scan via provincial ET and wound care nurses						
Organization	**Name and Type of Strategy/Resource**	**Target Audience**	**Focus of Content**	**Length of time for implementation**	**Evaluation**	**Limitations**
1.Eastern Health	1. Presentation about pressure injury prevention via PowerPoint and supplemented with in-person lecturing	Newly hired nursing staff working in long-term care	Content is focused on PI prevention but there are slides related to IAD includes definition, differentiation from PI, and prevention and management strategies	No specified length of time given	No evaluation component	-One time offered session.
	2. Mini web electronic system available on the authority's internal computer system	All nursing staff	Variety of information available regarding skin and wound care, with a small focus on IAD diagnosis and treatment measures	Self-paced and independent learning, with no specified length of time	No evaluation component	-Only available on internal electronic system therefore staff cannot complete at home
	3. Electronic module on the LMS re. PI prevention	All nursing staff	Content included on IAD and development of PI	No specific time provided	Within the module there are case studies and multiple choice questions but no formal grading.	-Not able to track participation via LMS -Staff have to be comfortable with the

						computer systems
	4. Wound care pocket guide	All nursing staff	Touches on definition of IAD, differentiation between IAD and PI, and prevention and treatment strategies.	Self-paced independent reading	None	-No ability to question or clarify content -Very brief information provided
	5. Kardex for binders in ICU	Nursing staff working in high-risk area	Used pictures and written text to convey information on identification, classification and treatment of IAD	Self-paced. Independent review for reference in clinical situations	None	-No ability to question or clarify content -If Kardex is misplaced information may not be easily accessible
2. Labrador Grenfell Health	1. Wound care pocket guide (as previous identified)	All nursing staff	As previously discussed.	Hard copy booklet and electronic link on the authority's internal computer system	None	As previously discussed.
	2. PI prevention material in the beginning stages of development	All nursing staff and families	Focus on PI, but will include definition of IAD to help differentiate between them.	Undetermined	Undetermined	Undetermined

Appendix B: Table for Data Collection for Internet Search

Findings from environmental scan via internet search						
Organization	**Name and Type of Strategy/Resource**	**Target Audience**	**Focus of Content**	**Length of time for implementation**	**Evaluation**	**Limitations**
1.RNAO	1. IAD and Skin Frailty Webinar Recordings of webinar available to view at later time	Registered nurses	IAD and Skin Frailty Evidence-based interventions related to prevention of IAD and factors that contribute to development of IAD	45 minutes. Offered at regular intervals.	No indication of formal evaluation, but did list two learning outcomes: 1.Explain best practice relating to IAD 2.Explain how they can influence optimal person-centered outcomes	-Cost per session is $16 - $20 -No mention of participants being able to actively engage in Q & A or clarify points. Is definitely not available on recorded version -Must have some level of knowledge and comfort with technology and have proper equipment and software
	2. Incontinence-Associated Tool (IADT)	Developed for nursing staff in long-term care	Practice guidelines for identifying risk for IAD, preventing and treating IAD. Used clear pictures,	Available for download and independent use.	No indication of formal evaluation.	-No opportunity to clarify or ask questions to creator. -Healthcare professionals need to be aware it exists to be able to access and

			definitions and short descriptions of skin changes and IAD classes.			use it
2. Wounds Canada	1. One session in a in-person wound care conference in 2018	Registered nurses	Assessment, classification, prevention and management of MASD, including IAD.	One session in a 4 day conference. Specific length of time for each session could not be found. Summary of contents of sessions provided in a online document.	None that could be located.	-Ability to take part in an out of province conference -Limited number of seats -Costs associated with attending
	2. Skin and Wound Care for Unregulated Care Providers - online modules & live webinar Archived and available for viewing.	Unregulated workers	Skin health and wound management. Focus on preventative measures for skin breakdown. MASD and IAD is a section of the content	7 modules that take 3.5 – 5 hours to complete. Self – paced One 4-hour webinar once online modules are completed.	Online exam consisting of 20 questions testing participants retention of the knowledge they received. A grade of 60% was required for successful completion of the course.	-Must have some level of knowledge and comfort with technology and have proper equipment and software -Cost of program $75 + tax -Time commitment
	3. Focus on the Prevention and Management of	Registered nurses and allied health	Best practice guidelines on MASD, including	4 – 5 hours to complete the online modules	Not discussed. Participants receive	Must have some level of knowledge and comfort with

	Moisture-associated Skin Damage: Knowledge program Two online modules and a live webinar, using case studies and live polling	professionals	IAD and how to apply into real life situations via case studies	1.5 hours for live webinar	certification of completion after all components are completed.	technology and have proper equipment and software -Cost $50 + tax -Must apply to complete
	4. Best Practice Recommendations for Prevention and Management of Moisture-associated Skin Damage online resource available to download or print	Front line clinicians, students, policy makers	Best practice guidelines on MASD, including IAD to support the application of best practice across into care. Information relayed in a step-by-step format with use of pictures to differentiate	To read independently on their own pace	Not discussed.	-Cost associated with downloading full guide, but no cost to save or print this section of the resource -No opportunity to clarify or ask questions to creator.
3.BC Provincial Skin and Wound committee	1.Guideline summary: Prevention and management of MASD, including IAD available to save, download, or print	Healthcare professionals	Description of each class including pictures and detailed presentation, and prevention and treatment strategies in a concise chart	To view and read independently	Not discussed.	No opportunity to clarify or ask questions to creator.

			format			
4. NSWOCC	1.Online webinar titled Maintaining Skin Integrity: Moisture Associated Skin Damage (MASD) and Wound Prevention Recorded for future viewing	Registered nurses	Contained content on skin and wound challenges, relationship between MASD, including IAD and wound development, and products to use treatment	1 hour in length	None. Q & A session after the presentation	-Not all nursing staff would be aware of the webinar -Specific computer software and internet service required to attend

Appendix C: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Stephanie Buffett

Title of Practicum Project: A Resource for the Prevention and Management of Incontinence-associated Dermatitis

Date Checklist Completed:

This project is exempt from Health Research Ethics Board approval because it matches item number _____3_____ from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix C: Consultation Report

Stephanie Buffett

Nursing staff who provide direct client care are in an ideal position to employ prevention and treatment measures for skin and wound care conditions. Incontinence-associated dermatitis (IAD) is a skin condition that can affect clients in most health care settings and can have detrimental effects on the health and well-being of those who develop it. To avoid these implications nursing staff must be knowledgeable regarding IAD: what places a client at risk, be able to recognize and diagnosis, and employ prevention and management strategies when appropriate. Registered nurses (RNs), licenced practical nurses (LPNs), and personal care attendants (PCAs) make up the nursing staff who should be equipped with adequate knowledge regarding best practice guidelines regarding IAD to improve practice and promote optimal client care outcomes. It has been identified through informal discussions with the clinical lead wound care consultant at Central Health in Newfoundland and Labrador, that the health authority currently does not have an educational resource for nursing staff focused on IAD. Thus, the decision was made to develop an educational resource for nursing staff who provide direct client care focusing on IAD knowledge. A literature review was conducted, and findings supported the use of an educational resource for translating knowledge regarding IAD to nursing staff. Additionally, an environmental scan was completed to identify existing resources related to IAD, both provincially and nationally, and concluded there is a lack of educational resources that directly focus on IAD knowledge.

The overall goal of this practicum project is to develop a resource for nursing staff to help with the prevention and management of IAD across all settings of Central Health. The goal of the consultations was to determine the educational content and method of delivery of an educational resource regarding IAD for nursing staff at Central Health.

The objectives of the consultations were to:

1. Explore the experiences of wound care consultants with caring for clients who have IAD;

2. Identify learning needs of nursing staff surrounding IAD, including barriers to education delivery and preferred methods of delivery.

Sources

For this project a sample of nurses who provide direct client care were selected for consultation to obtain their perspective on their learning needs related to IAD and to ascertain their preferred method of delivery for an educational resource. A sample of nursing staff was chosen from both acute care and long-term care settings. Within these samples two seniority nursing groups, novice and senior nurses, were surveyed to determine if there was a difference in learning needs based on both setting and/or experience. Knowles' (1978) theory of adult learning suggests that adults are more engaged in their learning experiences when are involved in the development of the learning strategies, thus supports the consultation of nursing staff who provide direct client care.

Central Health's wound care consultants were also chosen as a source for consultations as they are the specialists in skin and wound care for the health authority. The key contact for this project, Nicole Pitcher, explained that wound care consultants have specialized education and experience related to skin and wound care, including IAD. Nursing staff consult with wound care consultants when caring for clients who have IAD to assist with implementing treatment plans, including which products are most appropriate for a specific client. Additionally, they are often the individuals who develop and implement education for nursing staff related to skin and wound care, thus would be familiar with the learning needs of nursing staff related to IAD and barriers to specific methods of education delivery.

Data Collection

Data was collected for these consultations through survey questionnaires and individual semi-instructed interviews. A hard copy survey consisting of three multiple choice questions and five 4-point Likert scale questions was distributed to four nursing staff from acute care and four nursing staff from a long-term care facility for a total of eight participants. Prior to the distribution of surveys, a conversation occurred with staff to discuss the practicum project, the purpose of the survey, how the information obtained would be handled, and how information would be utilized for the practicum project. During the conversations it was reinforced that participation was voluntary. It was also explained that their consent would be implied if they completed a survey. Nursing staff were then asked if they would agree to complete the takeaway survey, which would have a one-week deadline for completion. Once staff agreed to participate further details were provided on how to complete the survey. Each staff member who agreed to participate was provided with a paper copy of the survey along with a letter detailing what was explained verbally regarding the consultation and their involvement. Along with the survey and the letter, nursing staff were supplied with an addressed envelope and instructed to place the completed survey within the envelope and call the number printed on the front to arrange pick up. A total of eight surveys were distributed to staff, completed, and returned by the submission deadline. A copy of the survey can be found in Appendix A of this report and the letter that accompanied the surveys can be found in Appendix B.

Information was collected from the wound care consultants through individual semi-structured interviews via telephone conversation and email correspondence. An interview guide was developed consisting of open-ended questions based on the findings from the literature review and the environmental scan. The questions were related to their experiences with clients

who had IAD, the perceived learning needs of staff, potential methods of education delivery, and perceived barriers to providing education to nursing staff related to IAD. A copy of the interview guide can be found in Appendix C. Prior to conducting the interviews an email was sent to staff detailing the overall purpose of the practicum project, the purpose of the consultation, and information pertaining to maintaining anonymity and confidentiality. The emails were followed up with a telephone or in-person conversation to request participation. Two out of the three wound care consultants agreed to participate prior to the submission deadline. Interviews took approximately 20 minutes to complete and hand-written notes were taken which were transcribed at a later date into a Word document.

Ethical Considerations

The Health Research Ethics Authority Screening (HREAS) tool was completed to determine if ethics approval was required for the consultations, and it was deemed that ethics approval was unnecessary. The completed tool can be found in Appendix D. All participants, for both the surveys and interviews, were educated about the purpose of the practicum project and the implications the consultation report will have for the project. All participants were made aware that their participation was voluntary, and that all responses would be kept private and confidential. They were made aware that once a survey was submitted and once an interview was completed that they could not withdraw their participation from the project, due to the information having no identifying characteristics. Data collected from surveys and interviews were kept on a password protected laptop and on a One Drive account that requires a username and password to sign in. Additionally, no names or direct identifiers of participants were used in the consultation report.

Analysis

Each of the eight surveys that were distributed to nursing staff, four in long-term care and four in acute care, were completed and returned. The results were compiled in an Excel document and analyzed using descriptive statistics, including totals and percentages. A discussion of the results is provided in this section of the paper. Portions of the survey results are displayed in table or chart format throughout out the report as applicable to provide a clear, concise representation of the data.

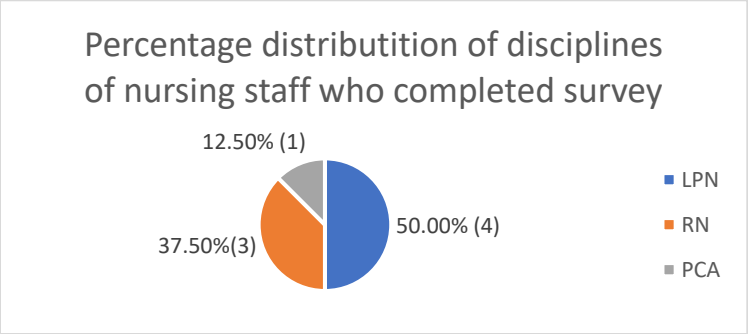
Participant Characteristics

While no direct identifiers were collected on participants to protect confidentiality and provide anonymity, several participant characteristics were collected that could provide information about differences in learning needs related to IAD knowledge between different groups and assist in developing a resource that can be used in various areas for a variety of staff. Participants were chosen from two different settings, acute care and long-term care, and two seniority groups, novice and senior nursing staff. 50% of the participants were recruited from acute care and 50% were recruited from long-term care. Additionally, 50% were novice nurses and 50% were senior nurses.

The survey requested that participants identify their discipline as this information was useful to determine if all nursing disciplines were represented in the sample. The majority of the participants were LPNs, representing 50% of the sample. 37.5% of participants were RNs and the remaining 12.5% were PCAs. This data is displayed in Figure 1.

Figure 1

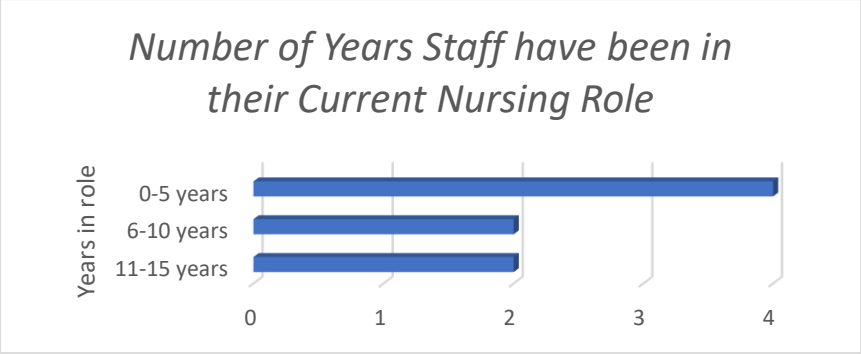
Percentage Distribution of Disciplines of Nursing Staff who Completed Survey



To gain a perspective regarding knowledge levels and learning needs of the different seniority groups, both novice and senior nurses were included in the sample. Two novice nurses and two senior nurses from both acute and long-term care settings were included, resulting in 50% of staff being novice and 50% being senior nursing staff. For the purpose of this project, a novice nurse was considered having 0-5 years of experience while greater than five years of experience was considered as senior nursing staff. The number of years participants have been in their current nursing role is displayed in figure 2.

Figure 2

Number of Years Staff have been in their Current Nursing Role



Assessment of Knowledge

Four 4-point Likert scale questions were used to determine the level of knowledge participants possessed regarding various aspects of IAD. According to the literature review, the most common aspects of IAD that adequately assessed nursing staff's knowledge were definition/etiology, risk factors, preventative measures, and treatment strategies. Therefore, the questions in this survey assessed IAD knowledge in the same manner. Participants were asked to rate their level of agreement to statements regarding their knowledge levels in specifics areas concerning IAD using strongly agree, agree, disagree, or strongly disagree. The results from the survey are displayed in Table 1.

Table 1

Knowledge Level Participants Possessed Regarding Various Aspects of IAD

Knowledge Statements	Strongly Agree	Agree	Disagree	Strongly Disagree
Definition and Etiology	12.5%	62.5%	25%	0%
Risk Factors	25%	50%	25%	0%
Preventative Measures	0%	75%	25%	0%
Treatment and Management	0%	62.5%	37.5%	0%

The first question utilized a Likert scale and asked *I am knowledgeable about the definition and etiology of Incontinence-associated dermatitis (IAD).* 25% of participants disagreed with this statement, 62.5% agreed with the statement, and 12.5% strongly agreed with the statement. While the majority of the respondents either agreed or strongly agreed that they were knowledgeable about the definition/etiology of IAD, a quarter of participants identified that they did not have a satisfactory level of knowledge in this area and thus supports that the inclusion of a definition of IAD could help close the gap in knowledge. The quarter of

participants who stated that they did not have a satisfactory level of knowledge are from the acute care setting and belong to both novice and senior seniority groups, indicating that seniority may not impact knowledge regarding the definition of IAD but that the care setting may.

The second Likert scale question was *I am knowledgeable about the potential risk factors that may lead to the development of IAD.* 25 % of participants disagreed with this statement, 50% agreed that they were knowledgeable, and 25% reported that they strongly agreed that they were knowledgeable about risk factors associated with IAD. The results for this question were varied but it does show there is some level of knowledge gap related to factors that could potentially place a client at risk for IAD, therefore an education resource for nurses related to IAD should include content on risk factors. The participants who admitted they did not have sufficient knowledge regarding risk factors for IAD were novice nurses in the acute care setting, while novice staff from long-term care have agreed that they were knowledgeable about risk factors for IAD. This may indicate that there is a greater need for IAD education in acute care than in long-term care, however education must occur in both settings to ensure staff in these areas obtain knowledge regarding IAD.

The third Likert question used to rate knowledge levels was *I am knowledgeable about ways to prevent the occurrence of IAD for my clients.* 25% of participants disagreed with this statement and 75% agreed with the statement that they were knowledgeable about preventative measures for IAD. Again, novice nurses in acute care made up the portion of participants who identified they were not knowledgeable about this aspect of IAD care. This would support that newly hired nursing staff should receive IAD education as early in their career as possible to close the existing gap in knowledge.

The fourth question from the survey was *I am knowledgeable about ways to treat and manage IAD for my clients.* 37.5% of participants reported that they disagree with this statement and imply that they do not have sufficient knowledge about how to provide treatment and management strategies, while the remaining 62.5% agreed with the statement. No participants stated that they strongly agreed or strongly disagree with the statement. The staff disagreeing with the statement that they are not knowledgeable about how to treat IAD were both novice and senior nursing staff from acute care. This indicates that the knowledge gap regarding IAD is greater in acute than long-term care and is obvious in both levels of seniority. Education focused on IAD should be directed in acute care settings for all staff, regardless of seniority level. This education can be included in orientation sessions when staff are hired and then made accessible to all nursing staff to refer to when necessary.

Level of Interest in Receiving IAD Education and Preferred Methods of Delivery

Participants were asked about their interest in receiving education regarding IAD through a Likert scale question. Of the eight participants, six strongly agreed to the statement that they were interested in receiving IAD education, while the remaining two participants agreed. No participants disagreed or strongly disagreed with this statement. This data supports that the development of an educational resource related to IAD would be welcomed by nursing staff at Central Health.

Participants were asked to select which method(s) of delivery they would prefer to receive education related to IAD, using a multiple-choice question with the following options: (a) in- person format, (b) electronic learning, (c) written material, (d) posters or infographics, (e) other. The *other* answer provided a blank line that participants could fill in their own suggestions

for modes of delivery. Additionally, participants were instructed to select all options that applied. Table 2 displays a count of participants who chose each type of preferred method of delivery.

Table 2

Method of Delivery Preference

Method of Delivery	**Percentage (Count)**
In-person Learning	50% (4)
Electronic Format	37.5% (3)
Written Material	12.5% (1)
Posters or infographics	37.5% (3)
Other	0% (0)

The most popular method of delivery of education chosen by participants was the in-person option, chosen by 50% of participants. Both electronic format and posters or infographics were the second highest chosen options with 37.5% participants selecting this option. Written material was chosen by 12.5% of participants. No participants chose *other* as an option, therefore there were no suggestions provided for an alternate method of delivery.

Wound Care Consultants

Of the three wound care consultants who were contacted for interviews, two responded and the results of their interviews are part on this report. Common themes were revealed through content analysis and discussed in this section of the report.

Experiences With Caring for Clients with IAD

The wound care consultants identified that occurrences of IAD are identified in all client care settings. They state that often clients who have been trying to manage at home with limited resources come into facilities having developed IAD. They stated that other clients they have be consulted for regarding IAD were admitted to an acute care setting but have deconditioned, often becoming bed bound, and awaiting long-term care. One of the consultants stated they are often consulted by nursing staff to see these clients to advise of treatment options.

Wound care consultants discussed that IAD is often challenging to treat and heal, since incontinence can be difficult or impossible to reverse. Additionally, they have found that caregivers often complete excessive vigorous cleansing of the skin, leaving the skin more vulnerable to injury. It was also shared that clients who experience IAD are at high risk for developing a pressure injury (PI). As well, they report that clients with IAD often experience pain and discomfort, having a profound impact on a clients' quality of life.

Learning Needs of Staff Related to IAD

Wound care consultants have identified several learning needs of nursing staff related to caring for clients with respect to IAD. Firstly, it was identified that completing skin care including prevention measures related to IAD, is often not given high priority within clinical settings. Specifically, encouraging toileting regimens, a strategy to maintain continence and reduce prevalence of IAD is often lacking in clinical areas. A consultant stated that nursing staff report that time constraints are a contributing factor for the identified lack of toileting regimens and proper skin care. Secondly, they identified that nursing staff have difficulty with distinguishing between IAD and PI in the early stages, impacting treatment measures.

Both wound care consultants recognized that nursing staff sometimes have difficulty with choosing appropriate cleansing techniques and/or the best treatment options. They reported that Central Health does have specific products available to assist with prevention and treatment of IAD, but they are not always consistently or appropriately used by nursing staff. One of the consultants suggested that Central Health employs a high number of staff who float between different clinical areas in the health authority and that this lack of staff consistency sometimes creates variations in skin care practices for clients. One wound care consultant suggested that skin care practices need to be consistent to see results for the client. Lastly, both consultants identified that staff need to be able to educate families and caregivers on how to prevent and manage IAD so that consistent practices are carried on once clients transition back to home. They stated that an educational pamphlet for families regarding IAD would also be beneficial for clients in the community setting and suggested this would be a valuable outcome of this project if time allows.

Methods of Education Delivery

It was identified by both consultants that concise and easy to read methods for knowledge delivery of IAD education would be useful for nursing staff. Suggestions included using charts with graphics and algorithms outlining steps and treatment measures. Posters were also identified by consultants as an effective way to present education in client care areas which correlates to the information obtained in the surveys where 37.5% of participants chose posters or infographics as a preferred method of delivery for IAD education. Electronic education and having resources available online were seen as beneficial as it provides easy accessibility, no limitations on time, and that staff can sometimes complete same at home. The wound care

consultants acknowledged that in-person learning is not always ideal as it has been difficult to get people to attend education sessions.

Barriers to Education Delivery

Time constraints were identified as the largest barrier to education delivery. As noted above, the wound care consultants reported that in-person education sessions have been difficult to conduct as staff often have difficulty attending due time constraints. While electronic learning has been advantageous as discussed previously, it was also identified as having limitations. Specifically, Central Health's learning management system currently does not have the ability to audit which staff have completed education modules.

Standardized Approach for All Staff and Care Settings

It was suggested that a standardized approach to preventative and management of IAD across the health authority would be most effective. The consultants felt that all disciplines of nursing staff should be educated regarding IAD and made aware of such protocols. They suggested that consistency is key and that adherence to protocols must be encouraged by leadership staff in the clinical settings; including educators, facilitators, and managers. Both specialists expressed that it would be important for education and protocols from acute care settings be transferrable to the community setting and that they could be implemented into clients' homes as well. Lastly, the wound care consultants suggested that IAD education, including best practice guidelines, be taught to staff as early as possible when hired, such as during employee orientation or even earlier. Currently, the consultants conduct education sessions on skin and wound care for students in the PCA and LPN programs and one consultant stated that they could include the educational resource on IAD in these sessions. The goal would

be that when nursing staff begin their practice in the clinical setting, they would already be familiar with the protocols and procedures associated with IAD.

Implications for the Practicum Project

The surveys completed by nursing staff who provide direct care to clients and the interviews with wound care consultants have provided invaluable information that will help guide the development of an educational resources for nurses related to IAD. The survey results suggest that both novice and senior nursing staff from acute care did not agree that they had knowledge on the definition and etiology of IAD and on treatment measures and that novice staff in acute care did not agree that they had knowledge on risk factors and prevention measures for IAD. This suggests that an educational resource related to IAD focusing on these knowledge areas wound be an asset for nursing staff. A clear definition of IAD will be provided in the educational resource as well as identifiable risk factors, prevention strategies, and practice guidelines on treatment options. It was apparent that novice staff identified a greater learning need with regards to IAD, thus education should be provided to staff as soon as possible after hire. It will be suggested to the key contact that the resource be presented to newly hired nursing staff as early as the initial orientation.

The findings of the interviews also suggest that nursing staff often have difficulty with correct diagnosis of IAD, indicated difficulty with distinguishing between IAD and PI, and implementing appropriate treatment measures. Therefore, information will be included in the resource regarding how to correctly diagnosis IAD and how to differentiate between IAD and PI, as well as treatment strategies. Additionally, through the interview process wound care consultants have provided perspective on their experiences with clients who have developed IAD, including identified risk factors and the implications of IAD that they have observed. This

insight validates similar findings from the literature review and supports the development of an educational resource for nursing staff related to IAD.

The findings of the surveys provided information regarding the method of delivery preferred by nursing staff who provide direct client care. In-person method of education delivery was the most popular choice from the surveys with 50% of staff choosing this as a preferred option. 37.5% of participants reported that they would prefer to receive IAD education through electronic format and 37.5% chose infographics and posters. Additionally, written education material was also chosen as a preferred method by 12.5% of participants. These methods of knowledge delivery were discussed in terms of benefits and limitations with the wound care consultants. They identified that in-person learning has its challenges with poor attendance and time constraints, therefore this was eliminated as a method of delivery for this resource. It was reported that electronic education is advantageous as it allows ease of access of information and there are no stringent time constraints associated, however there is often limited accountability. The wound care consultants suggested that visual aids such as pictures would be useful in providing information on IAD identification and classification. They also suggested that standard treatment protocols could be displayed in clear and concise manners such as charts or tables.

As a result of these discussions, it was decided that a toolkit would be developed regarding IAD knowledge, targeting nursing staff who provide direct nursing care at Central Health. This toolkit will include sections of IAD education including risk factors, prevention measures, diagnosing and differentiating from other conditions, and treatment strategies. The toolkit will also include a one-page practice guideline summary consisting of pictures and written information that can be displayed in poster format in client care areas. This will be a step-by-step guide to help nursing staff implement prevention and treatment measures in client care

areas. The toolkit will be presented in an electronic format and will be published on Central Health's internal computer system, the Intranet or on the learning management system. Copies of the toolkit can be printed and a hard copy placed at the nursing stations for easy access.

A common theme from the interviews of wound care consultants was that while proper care related to IAD is crucial in inpatient and long term-care settings, it is also important for this to be transferrable to the community setting. It was highly suggested that an educational pamphlet for caregivers and families would also be an asset to ensure proper care is provided in the community setting and that there is consistency of care upon discharge from inpatient settings. Therefore, the developed toolkit will include an educational pamphlet designed for nursing staff to share with caregivers and families to support proper care related to the prevention and management of IAD.

Conclusion

Prevention and treatment measures can help reduce the prevalence of IAD and its implications for clients. Thus, nursing staff who provide direct client care must be knowledgeable about these measures to assist clients to meet optimal healthcare outcomes. Wound care consultants and nursing staff who provide direct client care were identified as being valuable stakeholders for this practicum project and were consulted to obtain information that could be used to guide the development of the educational resource for nursing staff related to IAD. Information was obtained related to the learning needs of nursing staff and preferred methods of education delivery, including barriers. The identified learning needs surrounding IAD will guide the content of the resource, including definition, risk factors, prevention measures, differentiation from PI, and treatment options. The chosen method of delivery for the resource will be a toolkit that will consist of education on IAD presented in sections and will be

made available electronically. The toolkit will also include a practice guideline summary using pictures and written information in a chart format that can be displayed in nursing units and an information pamphlet for families and caregivers.

Appendix A: Survey for Nursing Staff

1. Please identify your discipline:

a. Registered nurse

b. Licensed practical nurse

c. Personal care attendant

d. Other _____

2. How many years have you worked in this role?

a. 0 - 5 years

b. 6 - 10 years

c. 11 - 15 years

d. 15 + years

Please rate your level of agreement with the following statements using a Likert scale from 1 – 4:

3. I am knowledgeable about the definition and etiology of Incontinence-associated dermatitis (IAD).

a. Strongly Agree

b. Agree

c. Disagree

d. Strongly Disagree

4. I am knowledgeable about the potential risk factors that may lead to the development of IAD.

a. Strongly Agree

b. Agree

c. Disagree

d. Strongly Disagree

5. I am knowledgeable about ways to prevent the occurrence of IAD for my clients.

a. Strongly Agree

b. Agree

c. Disagree

d. Strongly Disagree

6. I am knowledgeable about ways to treat and manage IAD for my clients.

a. Strongly Agree

b. Agree

c. Disagree

d. Strongly Disagree

7. I am interested in receiving or participating in an educational resource related to IAD.

a. Strongly Agree

b. Agree

c. Disagree

d. Strongly Disagree

Please circle all that apply:

8. What method(s) would you prefer to receive education related to IAD?

a. In person format

b. Electronic learning

c. Written material

d. Posters or infographics

e. Other_____

Appendix B: Survey Introduction Letter

Dear employee,

My name is Stephanie Buffett BNRN and I am a Master of Nursing student with Memorial University. I am currently completing a practicum project with Central Health regarding developing an educational resource for nursing staff related to incontinence-associated dermatitis (IAD) under the supervision of Ms. Erica Hurley. I am requesting your involvement in this project by completing a short survey about your knowledge level and desire for education related to IAD. The findings from the surveys will guide the development of an educational resource for nursing staff at Central Health. Your participation is entirely voluntary and if you complete and return this survey you are consenting to participate in this consultation. Additionally, your answers will remain anonymous in the report of the findings. I would like to have the completed surveys returned to me one week from the time you have received it. An envelope which has my name and telephone number has been provided. Once completed please seal the survey inside and contact me so that I can arrange to pick it up at a location of your choosing. You may withdraw and decide not to participate in the survey at any time but once it is submitted you will be unable to withdraw the information.

If you have any questions regarding the survey or the practicum project in general, please feel free to contact me at stephanie.buffett@centralhealth.nl.ca or 709-486-2591.

Kind regards,

Stephanie Buffett BNRN

Appendix C: Guide for Semi-structured Interviews of Wound Care Consultants

1.) What are your experiences with caring for clients with incontinence-associated dermatitis (IAD)?

2.) Can you identify any learning needs that nursing staff may have related to IAD prevention and management?

3.) From the findings of a literature review and environmental scan, multiple methods have been identified as being useful for translating knowledge related to IAD to nurses, for example booklets for independent learning, in person and online learning methods, and use of charts and graphics to display best practice guidelines in a concise manner. What are your thoughts on using any or all of these methods to educate nursing staff regarding IAD?

4.) Can you identify any barriers to providing education to nursing staff related to IAD?

5.) Do you have any other information to share or thoughts to add on this topic?

Appendix D: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Stephanie Buffett

Title of Practicum Project: A Resource of the Prevention and Management of Incontinence-associated Dermatitis

Date Checklist Completed: October 19, 2022

This project is exempt from Health Research Ethics Board approval because it matches item number _____3_____ from the list below.

9. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
10. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
11. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
12. Research based on review of published/publicly reported literature.
13. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
14. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
15. Case reports.
16. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix D: Toolkit

Stephanie Buffett

Understanding

Incontinence-Associated Dermatitis (IAD):

Prevention and Treatment

A Toolkit for Nursing Staff of Central Health

Table of Contents

Introduction

Incontinence-associated dermatitis (IAD) is a skin condition caused by prolonged exposure to urine and/or feces (Kottner & Surber, 2016). This condition can have profound impacts on the health and well-being of clients and the healthcare system.

One in five people who have incontinence and live in Canada or the United States have experienced some degree of IAD (Kaysar et al., 2019).

IAD is prevalent in all patient care settings including:

- Long-term care
- Medical units
- Surgical units
- Intensive care units
- Community setting, including in the home

(Ferreria et al., 2020; Johansen et al., 2018; Kayser et al., 2019; Van Damme et al., 2017).

Literature suggests that to decrease the prevalence of IAD and its implications, healthcare professionals must implement prevention and management strategies. Nursing staff who provide direct client care are in an optimal position to employ these measures, thus they must be knowledgeable regarding prevention, diagnosis, and treatment procedures related to IAD.

It was recognized that Central Health did not have a dedicated educational resource for nursing staff related to IAD to assist with knowledge translation and guide practice, therefore the decision was made to develop a toolkit.

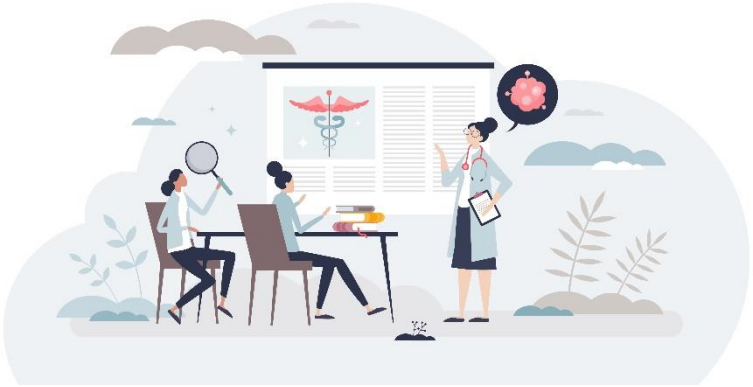
Purpose of the Toolkit

The main purpose of this toolkit is to assist nursing staff at Central Health in preventing, recognizing, and treating IAD in clients in their care. Staff include, but are not limited to, personal care attendants (PCAs), licensed practical nurses (LPNs), and registered nurses (RNs). The resource is intended to be utilized in all client care areas within Central Health.

More specifically, the toolkit can be used by nursing staff to:

1. Provide information about the implications of IAD; recognize clients at risk for IAD; provide information about prevention measures related to IAD; recognize signs of IAD; diagnose IAD; differentiate occurrences of IAD from other conditions; recognize when to inform other healthcare providers; employ treatment measures; select appropriate products; and reassess for reoccurrences of IAD.

2. Provide staff with information to educate clients, families, and caregivers (including home support workers) on the prevention and management of IAD in the community setting.



Section 1:
Recognizing Incontinence-Associated Dermatitis (IAD)

What is IAD?

IAD is skin damage that occurs from repeated exposure to urine and/or feces caused by incontinence (Kottner & Surber, 2016).

IAD is marked by:

- Redness
- Inflammation
- Lesions, including blisters
- Sensation of burning or itching
- Pain
- Diffuse borders

(Beeckman, 2017)

IAD can occur on many parts of the body, including the:

- Perineum
- Labial folds
- Groins
- Buttocks
- Upper thighs
- Lower abdomen

(Ferreria et al., 2020)

You may have heard IAD referred to in other terms such as nappy rash or diaper rash. The appropriate terminology to use is incontinence-associated dermatitis or its short form IAD!

Levels of Severity of IAD

IAD can by classified into three levels of severity: mild, moderate, and severe. Below is an example of healthy skin and examples of the three classifications of severity.

Healthy skin  *(3M, 2023)*	Skin is intact. There is no redness.

Mild  *(Connecting Learners with Knowledge [CLWK], 2019)*	Skin is still intact. Marked by light redness of the skin. Client does feel some discomfort.

Moderate  *(CLWK, 2019)*	Skin is peeling or flaking, small redness of partial-thickness skin damage and or small blisters are evident. Medium redness of the skin. Client experiences discomfort/pain.

Severe  *(CLWK, 2019)*	Deeper skin peeling or larger areas of erosion, large blisters, weeping skin. Dark redness and rash. Client experiences pain.

(CLWK, 2019)

Impact of Skin Tone on Appearance of IAD

A client's skin tone/pigmentation can affect the appearance of IAD. For example, clients who have a darker skin tone, the redness referred to above may be lighter or darker or appear purple or yellow (Van Damme et al., 2017).

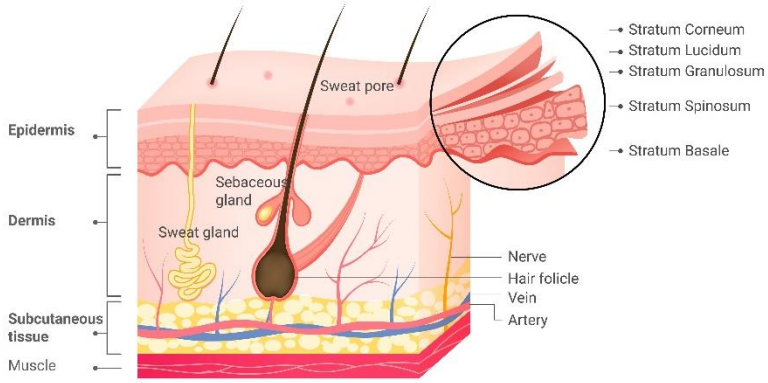
These are examples of IAD on people with different skin tones:

(Francis, 2019)

Used by Permission Joan Junken

Section 2:
Causes of IAD

To understand the cause of IAD you must understand the functioning of healthy skin.



The skin has several functions for the body:

- Protection against mechanical, thermal, and chemical injuries
- Prevents loss of moisture
- Regulation of body temperature
- Sensory abilities
  (Benedetti, 2021)

The main barrier of skin is located in the outermost layer, called the stratum corneum. When the cells of this layer (corneocytes) are disrupted damage to the skin occurs. Repeated exposure to urine and/or feces through incontinence can cause this disruption (Benedetti, 2021).

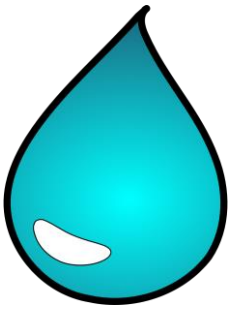
Understanding IAD on a Chemical Level

There are several processes that lead healthy skin to develop IAD. They include:

- Excess moisture
- A rise in pH
- Damage from enzymes
  (Beeckman et al., 2015)

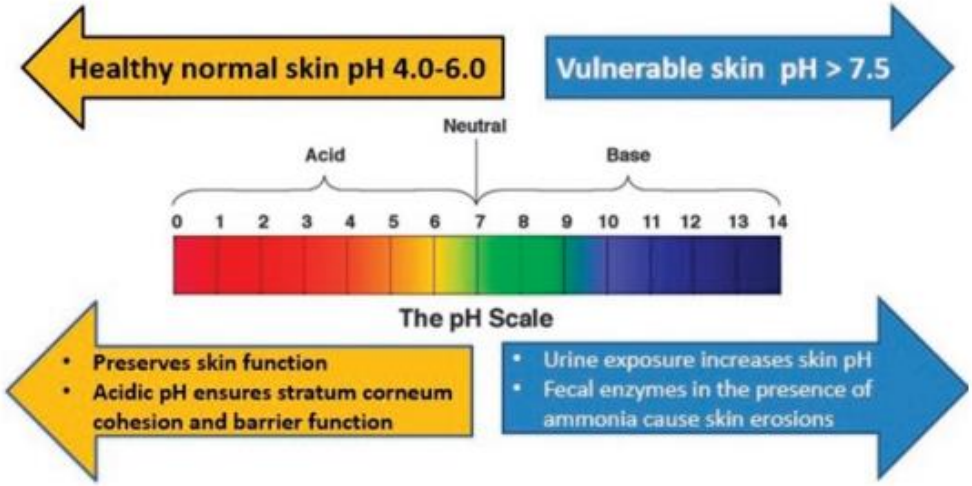
Excess Moisture

When a client is incontinent, the moisture from urine and/or feces is pulled into the cells of the outermost layer of skin (stratum corneum). This causes swelling and disruption of this outer layer causing visible skin damage, such as maceration. The skin is then more vulnerable to irritants entering the stratum corneum causing inflammation. As skin becomes overhydrated, it is more susceptible to injury caused by friction from linen, clothes, or incontinence products.



Rise in pH

As skin is exposed to urine, bacteria attempts to break down the urea in the urine to ammonia, causing the skin to become more alkaline creating a rise in the pH of the skin. As the pH rises microorganisms tend to grow and thrive and place the client at risk for developing an infection.



(McNichol et al., 2018)

Damage from Enzymes

Feces contains enzymes that break down fat and protein. These enzymes can cause damage to the stratum corneum. Liquid stool contains more enzymes, thus is more damaging to the skin than formed stool (Beeckman et al., 2015).

Risk Factors for IAD

There are common factors that predispose individuals for the development of IAD.

Some of these include:

- Incontinence
- Obesity
- Low Braden score
- Friction and linen issues
- Frequency of personal care provided
- Impaired mobility

Incontinence

Urine and feces are sources of moisture that skin is exposed to when a client is incontinent. While both urinary and fecal incontinence place a client at risk for IAD, those who experience both (dual incontinence) are more likely to develop an occurrence (Kaysar et al., 2019).

Low Braden Score

The Braden Scale is a standardized tool that is used to assess a client's potential for developing a pressure ulcer. A low Braden score is also associated with a higher risk of a client developing IAD (Van Damme et al., 2017).

*A copy of the Braden Scale used at Central Health can be found in Appendix A.

Obesity

Obesity is defined as a health condition that occurs when a patient has an excessive amount of body fat and their body mass index (weight in kilograms divide by square height in meters) is greater than 30 (Kopleman, 2000). Obesity is significantly associated with the development of IAD (Ferreria et al., 2020; Kaysar et al., 2019). Each additional 20kg of weight a patient carries above a healthy body weight significantly increase their likelihood of developing IAD (Kaysar et al., 2019).

Friction/Linen

Clients who have decreased mobility and have some level of dependence for care are routinely exposed to opportunities for friction and shear from bed linen and other surfaces (Kotowski et al., 2013). There is a significant association between exposure to friction and shear and the development of IAD (Kottner & Surber, 2016; Van Damme, et al., 2017).

Did you know?

Each additional layer of linen on a client's bed can increase the likelihood of developing IAD by 8.3% (Kaysar et al., 2019).

By limiting the use of unnecessary layers of linen on a patient's bed and reducing the potential shearing effect that surfaces can create on a patient's skin, clients would be at a reduced risk for IAD.

Frequency of Care Provided

The frequency that personal care is provided to incontinent clients can have a significant impact on the development of IAD (Conley et al., 2014; Phipps et al., 2019).

The longer urine and/or feces is in contact with the skin there are increases in:

- Moisture content of skin
- Skin pH
- Erythema (redness)
  (Phipps et al., 2019)

These are all factors associated with the development of IAD.

When the length of time increases between an episode of incontinence and when the client receives personal care, including changing of incontinence products or wet clothes they are more likely to develop signs of IAD or worsening of present symptoms.

Impaired Mobility

Impaired mobility results from a decrease in a person's range of motion and an inability to move purposefully in their environment limiting their functional ability of daily living (Gray-Miceli, 2017). Those with limited or impaired mobility are at high risk for the development of IAD (Kaysar et al.,2019; Kottner & Surber, 2016). In addition, if a client has a high level of dependence for care, including mobility assistance, they are more likely to develop IAD (Ferreira et al., 2020).

When a client has one or more of these risk factors the risk for IAD development is magnified!

Section 3:
Implications of IAD

Evidence supports that occurrences of IAD can have significant implications for clients who develop it and for the healthcare system.

Implications for Clients

Clients with IAD have an increased risk of developing more serious complications if untreated or improperly treated (Yates, 2020).

These complications can include:

- Development of a sacral pressure ulcer (Kaysar et al., 2021)
- Occurrence of fungal or bacterial infections (Ferrerira et al., 2020)
- Pain and discomfort (Kaysar et al., 2021)

Additionally, clients who are experiencing IAD in their homes may be incurring greater costs related to supplies and/or services for care.

Implications for the Healthcare System

Clients who develop IAD during hospitalization are more likely to have:

- Longer lengths of stay
- Higher rates of readmission to the hospital once discharged than those who do not have IAD

These factors have a direct impact on the healthcare system by limiting intake of admitted clients and adding to longer wait times for healthcare services.

Clients who receive treatment for IAD and/or its complications create significantly higher direct healthcare costs than those who do not have IAD. These costs include nursing hours, supplies, and other expenditures (Kaysar et al., 2021).

Section 4:
Prevention of IAD

The prevention of IAD involves identifying and removing the causative factors and careful, consistent monitoring.

Removing the Cause of Incontinence and Promoting Continence

Prevention must begin with exploring the cause for the incontinence and determining if it is reversible. In some cases, incontinence may be caused by an acute process such as an infection, constipation, or anatomical changes. This will require assessment and treatment by a primary care provider.

Strategies that can promote continence:

- Pelvic floor physiotherapy – this involves completing strengthening exercises of the pelvic floor muscles to help prevent leakage of urine. Clients can self-refer or be consulted to a physiotherapist for this service. (Batchelor et al., 2013)

- Promoting continence through the implementation of a toileting regimen or bladder and bowel training can also protect skin from excess moisture and damage caused by urine and/or feces.

Establishing a Toileting Regimen

Establishing a toileting regimen for bladder and bowel training may look different for different people. Generally, it involves establishing a schedule so that the client can sit on the toilet or commode on a regular interval. For example, a client may want to attempt urinating every 2-4 hours to prevent urinary incontinence (Leblanc et al., 2020).

Some people are continent during the day but may have episodes of incontinence during the night. In this case, the incontinence should not be accepted as the client's baseline but rather toileting should continue to be promoted during the day and before bed.

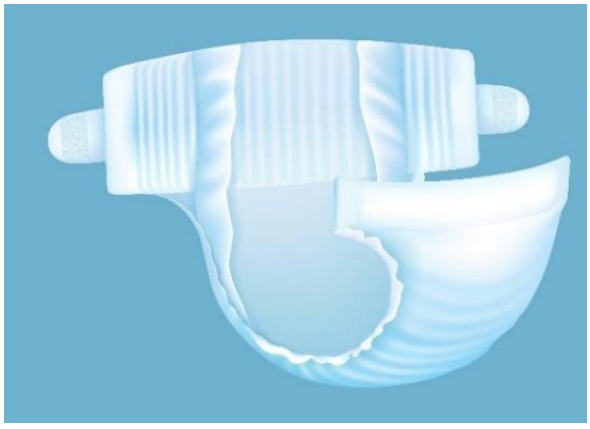
Proper Management of Incontinence

There are several types of products available that are routinely used to manage incontinence. These include:

- Incontinence liner – can be applied to regular underwear
- Pull ups - are used for lighter absorption and are easier to use when the client is continuing to toilet
- Absorptive brief (or attend) - more absorptive and are easier to change if the client is less mobile as they have removable tabs on the sides
- Waterproof bed pad or bed sheet – are laid underneath the patient

Remember:

- Choose the appropriate product based on volume of incontinence
- It is important to ensure that the product is properly fitted for the client. These products are not one-size-sits-all and come in a wide range of sizes
- Avoid doubling up products; for example, applying two briefs. If a client experiences high volume incontinence there are appropriate products to use to manage the fluid or more frequent changing may be required
- Change incontinence products and/or wet clothing as soon as possible after the episode of incontinence and on a regular schedule



Optimizing Nutrition

Assessing your client's nutritional status can identify areas within the diet that can be improved, promoting the prevention of tissue damage from IAD and aid in wound healing.

- Protein supports the body's maintenance and repair of its tissue, including skin. A diet high in protein can provide the body with optimal healing process for skin damage such as IAD (Grada & Phillips, 2022).

- Carbohydrates provide the body with energy to maintain skin and heal wounds.

- Clients can be referred to or self-refer to a dietician for further client specific nutritional advice.

Section 5:
The A.C.T. Approach to Prevention and Management Strategies

The prevention and management of IAD must take a consistent, structured approach. This approach can be divided into 3 processes using the acronym A.C.T. (McNichol, et al., 2018).

A – Assess

C – Cleanse

T – Treat

The A.C.T. process has been summarized in poster format and will be displayed in client care areas. It can be viewed in Appendix B.

If despite prevention efforts, a client does develop IAD, all preventative measures continue!

A: Assess

The assessment of the client's skin should occur after each episode of incontinence or at least a daily basis (LeBlanc et al., 2020).

The areas examined would include the following:

- Groins
- Buttock
- Upper thighs
- Gluteal folds
- Lower abdomen
- Perineum
- Any skin fold in these areas where moisture or stool can be trapped

Staff must inspect these areas for the presence or worsening of:

- Erythema (redness)
- Maceration (skin breakdown due to moisture)
- Lesions (including blisters or pustules)
- Erosion (breakdown of the outer layers of skin)

(McNichol et al., 2018).

Any inspected skin irritation should be documented appropriately on the clients' health record and communicated to those in charge of the client's care. A PCA should report this to the LPN or RN assigned to this client or the RN in charge, depending on the practice in the client setting.

Diagnosis

The accurate assessment and diagnosis of IAD is important to ensure:

- The client receives the right treatment
- Documentation is accurate
- Quality reporting is correct
  (Beeckman et al., 2015)

Early recognition and diagnosis of IAD can allow the prompt implementation of treatment measures promoting best outcomes for clients.

Remember:
If the client is not incontinent, it is not IAD!

Assessing for Complications

If a client should develop IAD and treatment measures are in place, staff are required to continually monitor and assess the condition of the skin to detect any further deterioration.

- When necessary, staff should notify the (RN or primary care provider) to ask for thorough assessment.

Nursing staff must monitor for signs that IAD is present and if complications from IAD have occurred. Two of the most common complications include secondary infection and development of a pressure injury.

- Secondary infection (bacterial or yeast):
  Signs that a yeast infection have developed on the skin include the presence of pinpoint pustules, usually white in colour, around the perimeter of the IAD (Beeckman, 2017). Treatment for this condition will be discussed later in the toolkit.

An example of an occurrence of IAD with a yeast infection:

© lavizzara /*Adobe Stock*

IAD and Pressure Injuries

It has been determined that the occurrence of IAD is a contributing factor for the development of a pressure injury (LeBlanc et al., 2020). However, IAD is also commonly misdiagnosed as a pressure injury (Yates, 2020). This can result in inappropriate treatment and potential development of complications. Therefore, it is important to distinguish between the two conditions to target prevention and treatment measures. It is also important to note that a client can develop both IAD and a pressure injury at the same time. The following chart can help you distinguish between the two conditions.

Incontinence-Associated Dermatitis	**Pressure Injury**
 (DermNet,2019)	 © ps3000/Adobe Stock
Usually located in the area of the perineum, buttock and groins	Usually occurs over bony prominences
Must have a history of urine and/or fecal incontinence	History of limited or immobility, or exposure to friction or tear
Client experiences pain, tingling and burning	Client experiences pain
Pink or red in colour	Red to purplish/blue in colour
Depth is usually superficial	Depth can be full thickness
Diffuse margins	Defined borders (Beeckman et al., 2015)

C- Cleanse

- Cleansing requires the removal of urine and/or feces from the client's skin
- Ensure to cleanse the client's skin daily and after each episode of incontinence
- Use a gentle, pH balanced cleanser
- No-rinse cleansers are preferred
- Avoid using alkaline or perfumed soaps
- Use soft, disposable wash cloths if available to limit friction damage
- Use a gentle, circular approach to cleansing
- Avoid excessive rubbing or scrubbing as this can create damage to the client's skin
- Gently pat the skin dry after cleansing; do not rub
  (LeBlanc et al., 2020)

T - Treat

Skin assessments will help guide staff in planning care for clients to prevent or heal IAD. This involves moisturizing and protecting the skin. This typically occurs after cleansing.

Moisturize

Applying moisturizer to a client's skin can help provide a skin barrier and promote the retention of the water content of the skin (McNichol et al., 2018).

Important things to remember:

- Moisturize a client's skin at least once a day
- Apply after bathing or showering
- Use unscented products
- Check the ingredient list to ensure the client is not allergic to any component of the product

Protect

After cleansing and moisturizing, skin protectants (also called barriers) should be applied to protect the client's skin from urine, feces, and moisture.

Skin protectants come in many forms:

- Cream
- Ointment
- Lotion
- Film
- Spray
- Paste

- It is important to note reapplication of these products would depend on the manufacturer's instructions as not all barriers are the same.

- Some products available are a combination of a barrier and a moisturizer in one. These types of products would eliminate one step of the process. (McNichol, et al., 2018)

Avoid using talc or other powders, including baby powder. Do not use any homemade mixtures such as flour that has been burnt. These are not best practice!

Consistency of Care

The successful prevention and management of IAD is dependent on a consistent approach to care.

- All healthcare staff involved in a client's care must be aware of the treatment goals and the processes outlined in the A.C.T. approach. Education and communication amongst the healthcare team is crucial.

- Staff must have easy access to the products and supplies needed to implement care for clients to prevent and treat IAD. For example, pH balanced cleansers, barriers, etc.

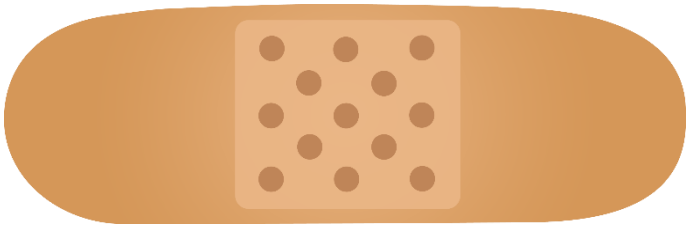
- Having supplies kept at the bedside is an efficient approach and ensures that a consistent strategy is used.

- Details regarding the products being used, treatments being completed, and any other details of a client's care should be clearly documented in their chart to communicate these details across the healthcare team.

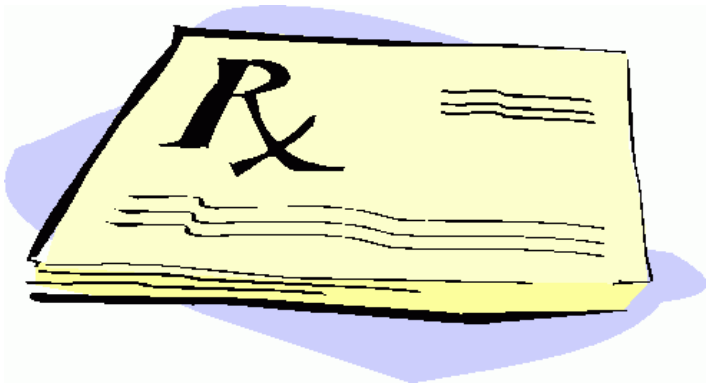
- Nursing staff should review this IAD education and other resources endorsed by Central Health related to skin health and wound care as needed to refresh information on skills and guide practice.

Additional Treatments

In cases of IAD where there are open wounds and/or weeping occurs dressings may be utilized to promote healing, however due to skin contours, contamination, and the presence of moisture they may be difficult to maintain (Beeckman et al., 2015). Therefore, the use of dressings should be a decision made by the care team and the client.



Moderate to severe cases of IAD may require the use of a topical steroid to reduce inflammation. Fungal or bacterial infections may also require topical medicated treatment (LeBlanc et al., 2020). These medications must be prescribed by the primary care provider (physician or nurse practitioner) and applied by staff who have this skill in their scope of practice (LPN or RN).



In severe cases of IAD, an internal urinary or fecal containment devices can be used if ordered by a primary care provider, which may include a foley catheter or a rectal tube. These are invasive measures, thus the benefits of using them must outweigh the risks. It is important to note that these should be considered short-term measures and are not the first choice of treatment (LeBlanc et al., 2020).

There are other less invasive containment devices that may be utilized to contain urine such as the condom catheter for a male and the PureWick external female urine collection device (Bagley & Severud, 2021).

(Beeson & Davis, 2018)

Section 6:
A Team Approach to Care

The prevention and management of IAD requires a team approach from multidisciplinary staff. All those involved in the client's care must be included in the treatment plan and aware of goals of care.

Communication and consistency are key!

The roles of each discipline with regards to IAD may include (but are not limited to):

Personal care attendants (PCA)	Provides day-to-day care for clients. Can identify first onset of IAD. Monitor clients who have identified cases of IAD. Consult with primary care provider as needed.
Licensed practical nurse (LPN), Registered Nurse (RN)	Provides day-to-day care for clients. Thorough assessments and monitoring. Can consult with primary care provider or wound care consultant about plan of care.
Physician/Nurse practitioner (NP)	Coordinates care of client, including managing co-morbidities. Complete assessment of client's skin and occurrences of IAD. Prescribe medication for symptom management or secondary infection.
Dietician	Provide nutritional assessment. Optimize nutritional intake for those at risk for malnutrition or dehydration. Maximize nutritional intake to aid with wound healing (i.e. high protein).
Physiotherapist	Teach strength building exercises to maintain physical ability and mobility. Teach techniques of pelvic physio to assist with maintaining continence.
Occupational Therapist	Can provide assessments on a client's environment especially surfaces to identify contributing factors for IAD. Assess cognitive and/or physical abilities to provide self-care related to hygiene and toileting and provide teaching.
Pharmacist	Review medications for any contribution to incontinence or suggest medications to improve. Suggest topical treatments.
Wound Care Consultant	Provide expert assessment of client's condition. Provide guidance on treatment plan.

(LeBlanc et al., 2020)

Engaging and Educating Clients, Families, and Caregivers

- Engaging clients and caregivers and educating them on strategies to prevent IAD is crucial as they control many of the factors that influence the development of IAD (LeBlanc et al., 2020).

- When clients and caregivers are educated on the various aspects of IAD prevention and care it supports the timely intervention and treatment.

- Nursing staff must include clients and their families or caregivers when conducting skin assessments and educate them on the signs to monitor related to IAD. Clients are in a position to help prevent a recurrence once they have knowledge on cause, prevention and monitoring.

- Encouraging engagement in these processes can help clients and their caregivers feel empowered and influence willingness to actively participate in care decisions and behaviours.

As Part of this toolkit a pamphlet has been developed for clients, families, and caregivers to provide education about recognizing signs of IAD and ways they can actively participate in prevention and management strategies. The pamphlet can be viewed in Appendix C.

Test Your Knowledge of Incontinence-Associated Dermatitis (IAD): Self Assessment Quiz

Determine if the following statements are true or false for questions 1-5:

1.) Clients who develop IAD generally have longer lengths of stay in the hospital.

True False

2.) Families should not be included in the assessment of IAD in clients.

True False

3.) Secondary yeast or bacterial infections may develop from occurrences of IAD.

True False

4.) IAD always looks the same in individuals with light skin tone and those with dark skin tone.

True False

5.) An effective way to manage incontinence is to apply two briefs or attends at once.

True False

Select the most appropriate answer for multiple choice questions 6-12:

6.) Which of the following is not a risk factor for IAD?

a.) Client is bedridden.

b.) Client has dual incontinence.

c.) Client has a diet high in protein.

d.) Client has a BMI of 38.

7.) Which statement is correct regarding moisturizing a client's skin?

a.) Moisturize a client's skin only once weekly.

b.) Moisturize client's skin only after IAD has occurred.

c.) Use unscented moisturizer.

d.) Moisturize client's skin prior to bathing.

8.) Which of the following is not a classification of IAD?

a.) Severe

b.) Scarce

c.) Mild

d.) Moderate

9.) Which of the following is an important member of the interdisciplinary that can play a role in preventing or managing IAD?

a.) Personal care attendant

b.) Dietician

c.) Physiotherapist

d.) All of the above

10.) Which of the following characteristics are true of IAD?

a.) Has defined borders

b.) Occur primarily over bony prominences

c.) Can cause blisters to occur

d.) Never causes a burning sensation

11.) Skin protectants or barriers come in which of the following forms?

a.) Paste

b.) Film

c.) Cream

d.) All of the above

12.) Which of the following is not a strategy to maintain continence?

a.) Implementing a toileting schedule

b.) Assess for a reversible cause for incontinence

c.) Once a client has their first episode of incontinence, encourage voiding in attends.

d.) Suggest client see a pelvic physiotherapist

Fill in the blanks with the most appropriate answer from the words provided for questions 13-18:

13.) An increase in _____ causes microorganisms to grow and thrive on the skin.

a.) pH b.) dryness

14.) _____ is integral in the team management of IAD.

a.) Inconsistency b.) Communication

15.) IAD can create _____ healthcare cost for the client and/or the healthcare system.

a.) lower b.) higher

16.) Diets high in _____ can promote skin health and wound healing.

a.) salt b.) protein

17.) _____ mobility is a risk for the development of IAD.

a.) Limited b.) Independent

18.) Skin is still intact in a _____ occurrence of IAD.

a.) mild

b.) moderate

Choose the correct diagnosis associated with the picture by choosing the best answer for questions 19-20.

19.) The picture below is an example of:

a.) IAD.

b.) Pressure injury.

(DermNet, n.d.-a)

20) The picture below is an example of:

a.) IAD.

b.) Pressure injury.

(DermNet, n.d.-b)

Answers to Self Assessment

1.) True

2.) False

3.) True

4.) False

5.) False

6.) c

7.) c

8.) b

9.) d

10) c

11.) d

12.) c

13.) a

14.) b

15.) b

16.) b

17.) a

18.) a

19.) a

20.) b

Additional Resources

Guideline for Moisture-Associated Skin Damage:

https://www.clwk.ca/get-resource/moisture-associated-skin-damage-masd/

Incontinence-Associated Dermatitis Best Practice Principles:

https://multimedia.3m.com/mws/media/1048834O/incontinence-associated-dermatitis-best-practice-principles.pdf

Best Practice Recommendations for the Prevention and Management of Moisture-associated Skin Damage:

https://www.woundscanada.ca/doclink/wc-bpr-prevention-and-management-of-moisture-associated-skin-damage-1949e-final/eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJ3Yy1icHItcHJldmVudGlvbi1hbmQtbWFuYWdlbWVudC1vZi1tb2lzdHVyZS1hc3NvY2lhdGVkLXNraW4tZGFtYWdlLTE5NDllLWZpbmFsIiwiaWF0IjoxNjQyMTEwNjczLCJleHAiOjE2NDIxOTcwNzN9.S7mKKQ3JunE-nVepnNESMB6uOd-EQyP9BCGVMHoZoZg

References

3M. (2023). *Understanding incontinence-associated dermatitis.* https://www.3mcanada.ca/3M/en_CA/medical-ca/conditions/incontinence-associated-dermatitis/

Bagley, K., & Severud, L. (2021). Preventing catheter-associated urinary tract infections with incontinence management alternatives: PureWick and condom catheter. *Nursing Clinics of North America*, *56*(3), 413–425. https://doi.org/10.1016/j.cnur.2021.05.002

Batchelor, F. A., Dow, B., & Low, M. A. (2013). Do continence management strategies reduce falls? A systematic review: Continence interventions and falls. *Australasian Journal on Ageing*, *32*(4), 211–216. https://doi.org/10.1111/ajag.12047

Beeckman, D. (2017). A decade of research on incontinence- associated dermatitis (IAD): Evidence, knowledge gaps and next steps. *Journal of Tissue Viability, 26*(1), 47–56. https://doi.org/10.1016/j.jtv.2016.02.004

Beeckman, D., Campbell, J., Campbell, K., Chimentao, D., Coyer, F., Domansky, R., Gray, M., Hevia, H., Junkin, J., Kardag, A., Kottner, J., Arnold Long, M., McNichol, L., Meaume, S., Nix, D., Sabasse, M., Sabasse, H., Yu, P, Voegeli, D., & Wang, L. (2015). *Proceedings of the Global IAD Expert Panel. Incontinence-associated dermatitis: Moving forward.* incontinence-associated-dermatitis-best-practice-principles.pdf (3m.com)

Beeson, T., & Davis, C. (2018). Urinary management with an external female collection device. *Journal of Wound, Ostomy and Continence Nursing, 45*(2), 187-189. https://doi.org/10.1097/WON.0000000000000417

Benedetti, J. (2021, December). *Structure and function of the skin.* Structure and Function of the Skin - Skin Disorders - MSD Manual Consumer Version (msdmanuals.com)

Conley, P., McKinsey, D., Ross, O., Ramsey, A., & Feeback, J. (2014). Does skin care frequency affect the severity of incontinence-associated dermatitis in critically ill patients? *Nursing, 44*(12), 27–32. https://doi.org/10.1097/01.NURSE.0000456382.63520.24

Connecting Learners with Knowledge (CLWK). (2019). *Guideline summary: Prevention & treatment interventions for moisture-associated skin damage (MASD).* https://www.clwk.ca/get-resource/moisture-associated-skin-damage-masd-2/d

DermNet. (n.d.-a). *Incontinence dermatitis* [Photograph]. https://dermnetnz.org/assets/Uploads/incontinence-dermatitis-10-v2__WatermarkedWyJXYXRlcm1hcmtlZCJd.JPG

DermNet. (n.d.-b). *Pressure ulcer 00002* [Photograph]. https://dermnetnz.org/assets/collection/Pressure-ulcer-paraplegia/pressure-ulcer-00002__WatermarkedWyJXYXRlcm1hcmtlZCJd.jpg

DermNet. (2019). *Incontinence-induced dermatitis* [Photograph]. https://dermnetnz.org/assets/Uploads/incontinence-dermatitis-02__WatermarkedWyJXYXRlcm1hcmtlZCJd.JPG

Ferreira, M., Abbade, L., Bocchi, S. C. M., Miot, H. A., Boas, P. V., & Guimaraes, H. Q. C. P. (2020). Incontinence-associated dermatitis in elderly patients: prevalence and risk factors. *Revista Brasileira de Enfermagem, 73*(Suppl 3), 1–6. https://doi.org/10.1590/0034-7167-2018-0475

Francis, K. (2019). Damage control: Differentiating incontinence-associated dermatitis from pressure injury. *Nursing Critical Care, 14*(6), 28–35. https://doi.org/10.1097/01.CCN.0000602748.09013.9d

Grada, A., & Phillips, T. J. (2022). Nutrition and cutaneous wound healing. *Clinics in Dermatology*, *40*(2), 103–113. https://doi.org/10.1016/j.clindermatol.2021.10.002

Gray-Miceli, D. (2017). Impaired mobility and functional decline in older adults: Evidence to facilitate a practice change. *Nursing Clinics of North America*, *52*(3), 469–487. https://doi.org/10.1016/j.cnur.2017.05.002

Johansen, E., Bakken, L. N., Duvaland, E., Faulstich, J., Hoelstad, H. L., Moore, Z., Vestby, E. M., & Beeckman, D. (2018). Incontinence-associated dermatitis (IAD): Prevalence and associated factors in 4 Hospitals in Southeast Norway. *Journal of Wound, Ostomy, and Continence Nursing, 45*(6), 527–531. https://doi.org/10.1097/WON.0000000000000480

Kaysar, S. A., Phipps, L., VanGilder, C. A., & Lachenbruch, C. (2019). Examining prevalence and risk factors of incontinence associated dermatitis using the international pressure ulcer prevalence survey. *Journal of Wound Ostomy Continence Nursing, 46* (4), 285-290. https://doi.org/10.1097/WON.0000000000000548

Kayser, S. A., Koloms, K., Murray, A., Khawar, W., & Gray, M. (2021). Incontinence and incontinence-associated dermatitis in acute care: A retrospective analysis of total cost of

care and patient outcomes from the Premier Healthcare Database. *Journal of Wound, Ostomy and Continence Nursing*, *48*(6), 545–552. https://doi.org/10.1097/WON.0000000000000818

Kopelman, J. (2000). Obesity as a medical problem. *Nature*, *404*(6778), 635–643. https://doi.org/10.1038/35007508

Kottner, J., & Surber, C. (2016). Skin care in nursing: A critical discussion of nursing practice and research. *International Journal of Nursing Studies*, *61*, 20–28. https://doi.org/10.1016/j.ijnurstu.2016.05.002

Kotowski, S. E., Davis, K. G., Wiggermann, N., & Williamson, R. (2013). Quantification of patient migration in bed: Catalyst to improve hospital bed design to reduce shear and friction forces and nurses' injuries. *Human Factors*, *55*(1), 36–47. https://doi.org/10.1177/0018720812474300

LeBlanc, K., Forest-Lalande, L., Rajhathy, E., Parsons, L., Hill, M., Kuhnke, J.L., Hoover, J., Lillington, T., & Cyr, M.H. (2020). Best practice recommendations for the prevention and management of moisture-associated skin damage. In: *Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada* (pp. 1-52) https://www.woundscanada.ca/doclink/wc-bpr-prevention-and-management-of-moisture-associated-skin-damage-1949e-final/

McNichol, L. L., Ayello, E. A., Phearman, L. A., Pezzella, P. A., & Culver, E. A. (2018). Incontinence-associated dermatitis: State of the science and knowledge translation. *Advances in Skin & Wound Care*, *31*(11), 502–513. https://doi.org/10.1097/01.ASW.0000546234.12260.61

Phipps, L., Gray, M., & Call, E. (2019). Time of onset to changes in skin condition during exposure to synthetic urine: A prospective study. *Journal of Wound, Ostomy and Continence Nursing, 46*(4), 315–320. https://doi.org/10.1097/WON.0000000000000549

Van Damme, N., Van den Bussche, K., De Meyer, D., Van Hecke, A., Verhaeghe, S., & Beeckman, D. (2017). Independent risk factors for the development of skin erosion due to incontinence (incontinence-associated dermatitis category 2) in nursing home residents: Results from a multivariate binary regression analysis. *International Wound Journal*, *14*(5), 801–810. https://doi.org/10.1111/iwj.12699

Yates, A. (2020). Incontinence-associated dermatitis 1: Risk factors for skin damage. *Nursing Times, 116*(3), 45–50.

Appendix A: Braden Scale

REGIONAL HEALTH LOGO

Section 5 – Appendix 2

BRADEN SCALE – FOR PREDICTING PRESSURE SORE RISK

Source: Barbara Braden and Nancy Bergstrom, copyright 1988.

Note: The lower the score, the greater risk of developing pressure ulcers. Refer to back for interventions.

RISK ASSESSMENT	SCORE/DESCRIPTION				Date of Assessment:			
Sensory Perception Ability to respond meaningfully to pressure related discomfort.	**1. Completely Limited** Unresponsive (does not moan, flinch or grasp) to painful stimuli, due to diminished level of consciousness or sedation. **OR** Limited ability to feel pain over most of body surface.	**2. Very Limited** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. **OR** Has sensory impairment, which limits the ability to feel pain or discomfort over ½ **of body.**	**3. Slightly Impaired** Responds to verbal commands but cannot always communicate discomfort or need to be turned. **OR** Has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	**4. No Impairment** Responds to verbal commands. Has no sensory deficit, which would limit ability to feel or voice pain or discomfort.				
Moisture Degree to which skin is exposed to moisture	**1. Constantly moist** Skin kept moist almost constantly by perspiration, urine etc. Dampness is detected every time patient is moved or turned.	**2. Often moist** Skin is often but not always moist. Linen must be changed at least once a shift.	**3. Occasionally moist** Skin is occasionally moist, requiring an extra linen change approximately once a day.	**4. Rarely moist** Skin is usually dry; linen only requires changing at regular intervals.				
Activity Degree of physical activity	**1. Bedfast** Confined to bed	**2. Chairfast** Ability to walk severely limited or nonexistent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	**3. Walks occasionally** Walks occasionally during day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	**4. Walks frequently** Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.				
Mobility Ability to change and control body position	**1. Completely immobile** Does not make even slight changes in body or extremity position without assistance.	**2. Very limited** Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently	**3. Slightly limited** Makes frequent though slight changes in body or extremity position independently.	**4. No limitations** Makes major and frequent changes in position without assistance.				
Nutrition Usual food intake pattern [1]NPO: nothing by mouth [2]IV: Intravenously [3]TPN: Total parenteral nutrition	**1. Very poor** Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. **OR** Is NPO[1] and/or maintained on clear liquids or IV[2] for more than 5 days.	**2. Probably inadequate** Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement. **OR** Receives less than optimum amount of liquid diet or tube feeding.	**3. Adequate** Eats over ½ of most meals. Eats a total of 4 servings of protein (meat, diary products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered. **OR** Is on a tube feeding or TPN[3] regimen, which probably meets most of nutritional needs.	**4. Excellent** Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and diary products. Occasionally eats between meals. Does not require supplementation.				
Friction and Shear	**1. Problem** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.	**2. Potential problem** Moves feebly or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	**3. No apparent problem** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.					
TOTAL SCORE: Total score of 12 or less represents HIGH RISK								

Assessment Date	Signature/Status	Assessment Date	Signature/Status

Appendix B – Poster

Incontinence-Associated Dermatitis

Incontinence-associated dermatitis (IAD) is a skin irritation that is caused by repeated exposure to urine and/or feces. IAD is characterized by redness, inflammation, pain, and lesions such as blisters that occur in the areas of the genitalia, perineum, upper thighs, and lower abdomen. Clients often describe experiencing itchiness, burning or pain in affected areas.

Healthy Skin

(3M, 2023)

- There is no redness of the skin.
- Skin is intact.

Mild

(CLWK, 2019)

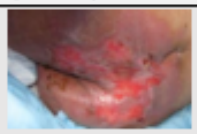
- Light redness of the skin.
- Skin is still intact.

Moderate

(CLWK, 2019)

- Medium redness of the skin.
- Skin is peeling or flaking.
- There are small areas of partial-thickness skin damage and/or small blisters

Severe



(CLWK,2019)

- Skin has a dark, red rash.
- Deeper skin peeling or larger areas of erosion, large blisters, and/or weeping skin.

To Prevent and Treat IAD follow these Guidelines and Remember to A.C.T!
(A consistent approach to care is key when managing IAD)

A – Assess

- Attempt to identify **reversible causes** for incontinence, i.e. constipation or UTI.
- Assess for and attempt to limit contributing **factors**, i.e. exposure to friction and tear, excessive use of linens, or poor nutrition.
- Encourage continence by establishing a **toileting schedule**.
- **Assess** skin with each change of incontinence product, during bathing, or at least once a day.
- Monitor for **early signs** of IAD or **worsening** of symptoms.
- **Document** assessments on the client's health care record as per organization's policy and communicate with the staff member who is responsible for the client's care.

C - Cleanse

- Change **incontinence product** and/or wet clothes as soon as possible after an episode of incontinence.
- Use gentle **skin cleanser** that is pH balanced. No-rinse is preferred.
- Avoid alkaline or perfumed **soaps**.
- Use soft, disposable **cloths** for cleansing.
- Avoid vigorous **scrubbing** or rubbing of the skin.
- Gently **pat dry** after cleansing.
- Ensure that all products the client requires (cleansers, cloths, attends, barriers, etc.) are **stored at the bedside** and are readily available for staff.

T – Treat

- Once the client's skin has been cleansed apply an unscented **moisturizer**.
- Use a **barrier product** as a skin protectant after cleansing and moisturizing. These may contain zinc or dimethicone.
- If using a thick **barrier** such as a zinc-based product, there is no need to scrub the skin to remove all of the product after an episode of incontinence.
- Watch for signs of **secondary infections,** including white patches on the skin, and consult with primary care provider. This may have to be treated with topical medications and applied by licensed staff members.
- Consult with **wound care consultant** for guidance on further treatment for moderate to severe cases.
- The presence of **broken skin** may require wound care and dressing application as recommended by the wound care consultant or primary care provider.

Appendix C - Pamphlet

IAD can occur in any setting for any client who experiences incontinence. Clients, family members, and caregivers can take an active role in the preventative and management measures for IAD to ensure optimal outcomes.

This pamphlet aims to educate clients and those who participate in their care about the signs of IAD and ways that they can actively participate in prevention and management strategies.

Preventing and Managing Incontinence-Associated Dermatitis

A Guide for Clients, Families and Caregivers

Central Health

What is Incontinence-Associated Dermatitis (IAD)?

IAD is a skin irritation that develops due to repeated exposure to urine or feces.

It can occur on the buttock, genitalia, upper thighs, or lower abdomen.

What Does IAD Look Like?

Skin in these areas may become red, sore, or develop blisters. IAD can cause burning or pain.

(CLWK, 2019)

People who develop IAD often describe feeling itchiness, burning or discomfort in affected areas.

Who is at Risk for Developing IAD?

Those who:

- are incontinent of urine and/or feces.
- have limited mobility.
- are obese.
- have poor nutritional status.

How Can Help Prevent IAD from Occurring?

Preventing IAD by:

- optimizing nutrition, including maintaining a high protein diet.
- establishing a toileting schedule to maintain continence. For example, sit or have your loved one sit on the toilet/commode every 2-4 hours and attempt voiding.
- changing attends/pullup and any wet or soiled clothing as soon as possible after the episode of incontinence.
- limiting the use of linen layers underneath the skin. Less is more.

To Prevent and Treat: A.C.T.

Assess

Check the skin every time a incontinence product is changed or during bathing.

Monitor for early signs of redness or worsening of current symptoms.

Cleanse

Cleanse the skin with warm water and gentle soap that is pH balanced.

Avoid alkaline or perfumed soaps.

Use a gentle cleansing action; do not scrub or rub the skin. Pat skin dry.

Treat

After cleansing the skin, apply an unscented moisturizer.

Use a barrier to protect skin, such as a zinc or dimethicone based cream.

Continue with all prevention measures.

When to contact a medical professional?
When IAD is not improving with above efforts, if you suspect an infection (white patches develop or fever occurs), or pain increases.