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Ostomy Care and Management

A Systematic Review

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ABSTRACT

The frequency of ostomy surgery in Canada is not known, but it is estimated that approximately 13,000 ostomy surgeries are performed annually in Canada. This systematic review incorporates evidence for the assessment and management of colostomies, ileostomies, and urostomies, as well as the peristomal skin. The review was completed as part of a best practice guideline document generated by a task force appointed by the Registered Nurses' Association of Ontario.

KEY WORDS: assessment of peristomal skin, best practice guideline, colostomy, ileostomy, management of peristomal skin, ostomy assessment, ostomy management, systematic review, urostomy

Introduction

An ostomy can be defined as any surgical procedure resulting in the external diversion of feces and urine through a stoma. The most common ostomies are a colostomy and ileostomy for diversion of the fecal stream, and urostomy for diversion of the urinary stream. Persons living with ostomies require specialized care and management to sustain physical health and quality of life (QOL). The provision of specialized ostomy care begins preoperatively and continues throughout the postoperative and rehabilitative period and throughout the patient's lifetime with an ostomy. Ongoing stoma and ostomy appliance sizing, the treatment of peristomal skin complications, ostomy appliance modifications, access to ostomy products and financial assistance, dietary consultation, and emotional support are just a few of the health management issues that require ongoing management following creation of an ostomy.

Based on findings from an online survey completed in 2006, the Registered Nurses' Association of Ontario (RNAO) identified ostomy care and management to promote best practice in nursing care of these individuals. A comprehensive systematic review was undertaken by the RNAO to provide evidence-based recommendations for registered nurses and registered practical nurses (as licensed in Ontario, Canada). The review focused on the assessment and management of persons with colostomies, ileostomies, and urostomies, including the assessment and management of the peristomal skin. The best practice guideline was published in 2009 and is available at http://www.RNAO.ca.

In January 2008, an international, interprofessional panel of nurses and allied healthcare professionals with expertise in practice, education, and research on ostomy care and management from a range of practice settings was convened under the auspices of the RNAO. The panel discussed the purpose of their work and came to consensus on the scope and purpose of the best practice guideline as well as the clinical questions it wished to answer by searching the literature. The systematic review was guided by the following clinical questions, as developed by the guideline development panel:

1. What physical and psychosocial needs require nurse-led interventions to prepare the neonate, pediatric, or adult populations for ostomy surgery?
2. What nurse-led interventions are effective in improving ostomy care and peristomal skin care (eg, reducing degree/frequency of complications, shortening healing time) in neonatal, pediatric, or adult populations?

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Conflict of interest: Dr. Gray serves on the Peristomal Skin Working Group for Hollister Inc.

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3. What nurse-led interventions are effective in promoting patient self-care of ostomy and peristomal skin in pediatric or adult populations?
4. What nurse-led interventions are effective in managing complications in ostomies and peristomal skin in neonatal, pediatric, or adult populations?
5. What are the special considerations in caring for individuals with ostomies who have special needs, including blindness?
6. What are the educational needs of nurses looking after individuals with ostomies?
7. What patient-focused educational interventions are effective in improving physical and psychosocial status of individuals with ostomies?
8. What resources used by nurses in ostomy care are most effective in managing ostomies (eg, promoting healing, reducing complications)?
9. What resources used by patients in self-managed ostomy and peristomal care are most effective in managing ostomies (eg, promoting healing, reducing complications)?

Methods

A literature search was conducted in February 2008 in the following electronic databases: MEDLINE, CINAHL, PsycINFO, and EMBASE. Broad search terms included stoma, ostomy, enterostomy, cecostomy, colostomy, continent ileostomy, duodenostomy, ileostomy, jejunostomy, ureterostomy, urinary diversion, fecal diversion, ostomy care, peristomal skin care, complications, education, QOL, enterostomal therapy, and nursing. English-language systematic reviews and primary studies were included if they were within the scope of the clinical questions and published between 1998 and 2008. There was no preference on the basis of research design; both qualitative and quantitative primary studies of various designs were included. Studies were excluded if they included only the following terms: fistula, neobladder, continent diversions, gastrostomy, tracheostomy, esophagostomy, and nephrostomy. These key terms were excluded because the focus for this guideline was the 3 most commonly created ostomies: colostomy, ileostomy, and urostomy. In the fall of 2011, the RNAO updated the information in the manuscript in order to seek publication of the systematic review. Two independent research assistants were asked to review the literature and update the manuscript.

The initial search identified 929 abstracts that were independently screened for inclusion by 2 master's prepared registered nurses. The final screen occurred after a pilot test to facilitate consistency in screening procedures was completed. Results were compared and any disagreements were resolved by discussion. Based on this initial review of abstracts, 80 articles were included for full-text review. Sixteen were subsequently excluded and another 3 were excluded because they were unavailable for retrieval. The remaining 61 articles were independently reviewed for methodological quality; results were compared and any disagreements were resolved by discussion. Given the diversity with respect to research design across the included studies, a variety of instruments were used to assess methodological quality as directed by the RNAO (the Appendix). Articles were subsequently categorized based on relevance to clinical questions. In some cases, an article addressed more than 1 clinical question and therefore was included in multiple categories. Reviewers discussed relevant themes arising from the literature.

The second search in the fall of 2011 found an additional 193 abstracts. All articles were reviewed by 2 master's prepared registered nurses to determine if they met the inclusion criteria. Results were compared and any differences were resolved by discussion. A total of 95 articles were included in this final review: 69 quantitative, 11 qualitative, and 8 systematic reviews. In some instances, articles were included under more than 1 question. Articles were not included if they were not research based, were not retrievable, did not meet the inclusion criteria, or were duplicates of previously included works. This manuscript represents the culmination of the updated literature and the shared findings of the reviewers.

Literature Review

While the clinical questions were intended to address ostomy care for neonatal, pediatric, and adult populations, only 2 studies were found in the initial review[1,2] and no studies identified in the updated review that discussed issues relevant to pediatric patients and their families. There were 3 qualitative papers that did address issues of relevance to adolescents and young adults.

Question 1: What physical and psychosocial needs require nurse-led interventions to prepare the neonate, pediatric, or adult populations for ostomy surgery?

There were 32 quantitative studies considered for the context of this question. Please note that not all articles are included in the discussion; however, a complete list of all articles reviewed is provided in Table 1. Studies that addressed the physical and psychosocial needs, including factors contributing to QOL, predictors of complications, and the importance of preoperative education and postoperative follow-up were identified and assessed for quality. Better understanding of the needs and symptoms of stoma patients will assist healthcare professionals with their care and may improve the QOL for these patients.[3]

Five studies focused on overall health-related QOL after stoma surgery.[3-7] Overall these studies described poorer QOL in persons with stomas reporting difficulty with work/social function, sexuality/body image, and stoma function. Siassi and colleagues[5,6] discussed QOL and patient expectations following ostomy surgery. They

TABLE 1.

Articles Reviewed by Clinical Question[a]

Citation	Study Design	Appraisal Instrument
Clinical Question 1: What physical and psychosocial needs require nurse-led interventions to prepare the neonate, pediatric, or adult populations for ostomy surgery?		
Authors unknown[51]	Qualitative	CASP qualitative
Bossema and colleagues[16] (2011)	Questionnaire	Quantitative tool
Celasin and colleagues[54] (2011)	Survey	Quantitative tool
Coons and colleagues[19] (2007)	Cross-sectional survey	Quantitative tool
Cotrim and colleagues[3] (2008)	Cross-sectional survey	Quantitative tool
Daluvoy and colleagues[55] (2008)	Retrospective review	Quantitative tool
Dazio and colleagues[26] (2009)	Qualitative	CASP qualitative
England and Subramaniam[56] (2007)	Retrospective chart review	Quantitative tool
Gilbert and colleagues[57] (2007)	Cross-sectional questionnaire	Quantitative tool
Gobet and colleagues[58] (2009)	Retrospective chart analysis	Quantitative tool
Gore and colleagues[59] (2009)	Retrospective chart analysis	Quantitative tool
Ho and colleagues[60] (2011)	Survey	Quantitative tool
Jansen and colleagues[10] (2010)	Systematic review	AMSTAR
Jimenez and colleagues[61]	Prospective/longitudinal	Quantitative tool
Kasparek and colleagues (2011)	Secondary analysis	Qualitative tool
Lidor and colleagues[21] (2011)	Secondary analysis	Qualitative tool
Ma and colleagues[18] (2007)	Survey	Qualitative tool
McMullen and colleagues[23] (2008)	Qualitative	CASP qualitative
Nicholas and colleagues[62] (2008)	Qualitative	CASP qualitative
Nichols[63] (2011)	Cross-sectional survey	Quantitative tool
Neuman and colleagues[7] (2011)	Longitudinal survey	Quantitative tool
Oderda and colleagues[12] (2008)	Systematic review	AMSTAR
Osterfeld and colleagues[17] (2008)	Longitudinal survey	Quantitative tool
Pittman and colleagues[13] (2009)	Systematic review	AMSTAR
Ramirez[25] (2011)	Qualitative	CASP qualitative
Savard and Woodgate[27] (2009)	Qualitative	CASP qualitative
Scarpa and colleagues[64] (2009)	Prospective analysis	Quantitative tool
Sharpe and colleagues[65] (2011)	Prospective analysis	Quantitative tool
Siassi and colleagues[5] (2009)	Questionnaire/mixed methods	CASP Qualitative/quantitative tool
Siassi and colleagues[6] (2008)	Prospective/mixed methods	CASP Qualitative/quantitative tool
Simmons and colleagues[66] (2009)	Scale testing	Quantitative tool
Sinclair[29] (2009)	Qualitative	CASP qualitative
Smith and colleagues[15] (2009)	Survey/observational	CASP cohort
Somani and colleagues[11] (2009)	Systematic review	AMSTAR
Soulsby and colleagues[67] (2010)	Questionnaire	Quantitative tool
St Jernman and colleagues[68] (2010)	Questionnaire	Quantitative tool
Sylvia and Jones[8] (2010)	Qualitative	CASP qualitative
Symms and colleagues[24] (2008)	Case control/mixed	CASP cohort
Taylor and Morgan[9] (2011)	Systematic review	AMSTAR
Thorpe and colleagues[14] (2009)	Systematic review	AMSTAR

(*continues*)

TABLE 1.

Articles Reviewed by Clinical Question[a] (*Continued*)

Citation	Study Design	Appraisal Instrument
Trininic and colleagues[4] (2009)	Cross sectional survey	Quantitative tool
Wade and colleagues[69]	Retrospective audit	Quantitative tool
Clinical Question 2: What nurse-led interventions are effective in improving ostomy care and peristomal skin care (eg, reducing degree/ frequency of complications, shortening healing time) in neonatal, pediatric, or adult populations?		
Bryan and Dukes[34] (2010)	Retrospective audit	Quantitative tool
Greenblatt and colleagues[31] (2010)	Retrospective chart analysis	Quantitative tool
Hoeflok and colleagues[70] (2009)	Survey	Quantitative tool
Jemec and colleagues[35] (2011)	Model testing	Quantitative tool
Jensen and colleagues[71] (2009)	Questionnaire	Quantitative tool
Kalashnikova and colleagues[33] (2011)	Algorithm evaluation	Quantitative tool
Parmer and colleagues[72] (2011)	Prospective case study	Quantitative tool
Ratliff[73] (2010)	Prospective observation	CASP cohort
Sinha and colleagues[74] (2009)	Correlational survey	Quantitative tool
Varma[36] (2009)	Systematic review	AMSTAR
Welser and colleagues[37] (2009)	Comparative cross over	Quantitative tool
Whitely and Sinclair[32] (2010)	Retrospective analysis	Quantitative tool
Williams and colleagues[43] (2010)	Descriptive questionnaire	Quantitative tool
Clinical Question 3: What nurse-led interventions are effective in promoting patient self-care of ostomy and peristomal skin in pediatric or adult populations?		
Carlsson and colleagues[38] (2010)	Mixed survey	Quantitative tool
Lynch and colleagues[75] (2008)	Timed series survey	Quantitative tool
Nichols and Reimer[22] (2008)	Survey	Quantitative Tool
Clinical Question 4: What nurse-led interventions are effective in managing complications in ostomies and peristomal skin in neonatal, pediatric, or adult populations?		
Corbett and Turnock[76] (2010)	Retrospective chart audit	Quantitative tool
Courtney and colleagues[77] (2009)	Prospective audit	Quantitative tool
Ginger and colleagues[78] (2010)	Retrospective chart audit	Quantitative tool
Gore and colleagues[79] (2011)	Chart review	Quantitative tool
Nybaek and colleagues[40] (2010)	Comparative case study	Quantitative tool
Osifo and colleagues[41] (2008)	Retrospective chart review	Quantitative tool
Rathnayake and colleagues[42] (2008)	Prospective audit	Quantitative tool
Richbourg and colleagues[80] (2008)	Survey	Quantitative tool
Rudoni and Dennis[81] (2009)	Questionnaire	Quantitative tool
Sung and colleagues[39] (2010)	Retrospective analysis	Quantitative tool
Wiener and colleagues[82] (2011)	Retrospective analysis	Quantitative tool
Clinical Question 5: What are the special considerations in caring for individuals with ostomies who have special needs, including blindness?		
Hocevar and Gray[83] (2008)	Systematic review	AMSTAR
Mahjoubi and colleagues[44] (2007)	Cross-sectional	Quantitative tool
Symms and colleagues[24] (2008)	Mixed methods/case control	CASP Qualitative/ Quantitative tool
Wilson and Kerr[45] (2009)	Survey	Quantitative tool

(*continues*)

TABLE 1.

Articles Reviewed by Clinical Question[a] (*Continued*)

Citation	Study Design	Appraisal Instrument
Clinical Question 6: What are the education needs of nurses looking after individuals with ostomies?		
Gemmill and colleagues[46] (2011)	Pilot study	Quantitative tool
Law and colleagues,[47] (2010)	Mixed methods	CASP qualitative/ quantitative tool
Clinical Question 7: What patient-focused educational interventions are effective in improving physical and psychosocial status of individuals with ostomies?		
Culkin and colleagues[48] (2009)	Questionnaire	Quantitative tool
Thorpe and colleagues[14] (2009)	Systematic review	AMSTAR
Clinical Question 8: What resources used by nurses in ostomy care are most effective in managing ostomies (eg, promoting healing, reducing complications)?		
Lo and colleagues[49] (2009)	Randomized control trial	Quantitative tool
Clinical Question 9: What resources used by patients in self-managed ostomy and peristomal care are most effective in managing ostomies (eg, promoting healing, reducing complications)?		
None		

Abbreviation: AMSTAR, Assessment of Multiple Systematic Reviews.[42]

[a]CASP cohort = "12 questions to help you make sense of a cohort study"[40]; CASP qualitative = "10 questions to help you make sense of qualitative research"[39]; Quantitative tool = Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies.[41]

noted that clinical parameters had limited effect on a patient's QOL. As well, those undergoing closure of the stoma noted no change in overall QOL after that procedure. Reported findings in this area showed that persons with stomas experienced poorer results in emotional and cognitive functioning, social isolation, and psychological dysfunction pertaining to depression, loneliness, feelings of stigma, and low self-esteem compared with nonstoma patients.[3,4] These studies highlight the importance of psychological treatment as an integral part of the treatment plan for stoma patients' coping and adaptation to their altered body state.

There were 7 qualitative studies that addressed either the lived experience or QOL issues for those with an ostomy, 1 paper identified that the role nurses took in their approach to caring for an individual with an ostomy made a significant difference in their recovery. Furthermore, WOC nurses had the unique ability to influence outcomes of care for those struggling with issues related to stoma and wound care.[8] A complete list of articles reviewed is provided in Table 1.

There were 5 systematic reviews included that discussed aspects of QOL for the person with an ostomy, noting that social health as a concept was most interesting to explore as there is less reported literature in this area.[9] Table 1 provides a complete list of articles reviewed.

The literature refuted previously published claims by stating that QOL is influenced by both external value systems and a complex set of internal values.[9] Jansen and colleagues[10] found that overall QOL of long-term colorectal survivors appears to be comparable to population norms. However, colorectal cancer survivors may have slightly worse physical QOL, suffer from long-lasting symptoms such as bowel problems, often report distress related to cancer, and have worse depression scores.[11]

Findings from cross-sectional studies suggest that multiple factors, including the underlying reason for an ostomy, presence and severity of ostomy complications, presence and severity of comorbid conditions, sexual function, age, and ability to pay for ostomy supplies influence health-related QOL.[11]

Oderda and colleagues[12] tested a number of tools for measuring QOL with elderly patients and found that this was one of the few studies assessing the measurement of QOL in the elderly. They articulated the challenges in assessing QOL with the elderly in general and in particular in this circumstance.[13]

Quality of life among long-term cancer survivors, when compared to the QOL of the general population, mirrors that of the general population. A key difference, however, was the degree of long-term discomfort and symptoms they continued to experience. Taylor and Morgan[9] assessed QOL for those undergoing stoma reversal post–rectal cancer treatment. It was also noted that high-quality nursing support before, during, and after surgery is a key component to positive outcomes in this population.[9]

The experience of body change through stoma formation has been explored. The most pertinent finding was the degree to which ostomates experienced profound body image changes as a result of the stoma formation and the effect this had on an embodied wholeness.[14]

Coping and adaption are affected by stoma type (eg, temporary vs permanent).[7,15] Increased life satisfaction was reported in those with permanent stoma compared with those with temporary stomas. Patients with reversible

ostomies initially reported higher life satisfaction; however, as time progressed, these patients reported declining life satisfaction.[15] Furthermore, there was a significant positive effect of time, in persons with a permanent stoma, indicating an increase in well-being whereas there was no effect of time in the group with a temporary stoma. This finding suggests that knowing an adverse situation is temporary can interfere with adaptation in the longer term.[15] In comparison, it was found that patients who underwent stoma reversal continued to experience difficulty with body image and feeling attractive.[7]

Negative reactions to the stoma can improve over time of having the stoma.[7,15,16] There were no significant differences between persons with and without a stoma with respect to global health/QOL, physical role, emotional, cognitive, and social functioning after approximately 8 years after stoma surgery.[7] A longitudinal study by Osterfeld and colleagues[17] found that stoma patients who had initially reported strong feelings of disgust/shame, inability to handle their stoma bag and poor physical/emotional well-being, improved their scores 3 months to a year later, resulting in improved QOL.[17]

Age was reported as an important factor related to improving QOL. It was reported that older patients were able to reach their maximum QOL by 6 months, whereas younger patients had improved QOL at approximately 12 months postostomy surgery.[17] Predictors of problems adjusting to the ostomy were age, being married or living with a partner, income, being retired, years since surgery, and stoma site marking prior to surgery.[18,19] Pittman and colleagues[20] and Lidor and colleagues[21] found that lack of adequate income or health insurance was a powerful predictor of disease severity and QOL. Occupational stability and spouse/life partner profoundly influence life satisfaction following life-altering ostomy surgery. Nichols and Riemer[22] indicated that those not married prior to surgery and those who experienced habit and/or occupational change reported a nonpositive life satisfaction score.

From a qualitative perspective, McMullen and colleagues[23] noted 6 distinct themes that caused ostomates the greatest challenges: dealing with the ostomy and appliances; discomfort, comorbidities, and complications; healthcare barriers, quality, and service; negative psychosocial impacts; support and education; and coping philosophies and adaptations.

There were a number of studies that described significantly lower sexual activity among persons with ostomies and how this contributed to greater social isolation and negative body image.[3,23,24] Symms and colleagues,[24] using a case-control, mixed-methods study design in male patients with ostomies, found that age (ie, being younger), income, and type of ostomy (ie, ileostomies) were positively associated with resumed sexual activity. The ability to resume sexual activity after an ostomy improved enjoyment of life, greater satisfaction with appearance, and less interference with social activities.[3,24] It is important for WOC nurses to assess sexual concerns pre- and postoperatively to assist with patients' adjustment to an ostomy.[24]

There were 2 qualitative papers that discussed the challenges associated with sexuality after an ostomy.[25,26] Issues of sexual challenges and adaptations in female colorectal cancer survivors with ostomies were discussed by Ramirez.[25] It was noted that while there were some women who reported that their ostomy did not interfere with their sexual participation as long as the ostomy pouch was in place and leakage-prevention measures (eg, using towels, nightgowns for coverage) were followed. However, their partners' attitudes varied. Other women in this study either experienced long-term challenges such as painful intercourse or chose to discontinue sexual behavior all together. Women who experienced pain during intercourse indicated that more of their physical challenges related to sexuality postostomy developed as a result of their cancer treatment rather than the ostomy itself. Furthermore, those who were already in a partnership experienced less difficulty than those who were not. Participants who were not in a partnership noted that the stoma served as a barrier to the development of a potential partnership.[25]

Dazio and colleagues[26] explored the experiences of being male and undergoing surgery for colorectal cancer resulting in an ostomy. While findings did not dwell on sexuality per se, they articulate the challenges the men experienced toward their masculinity and sense of themselves as a man. The researchers believe that the symbolism given to the colostomy models transformed the body, generating conflict due to the loss of the previous life and echoing the hegemonic meanings of masculinity.[26]

Pre- and postoperative education and follow-up were addressed in many of the included studies.[21,24,27] Pre- and postoperative education can facilitate adjustment, reduce complications, and improve overall QOL. A cross-sectional descriptive study suggested that a WOC nurse intervention can play a clinically relevant role in the recovery of persons undergoing ostomy surgery; furthermore, that the WOC nurse intervention should address social connectivity, life satisfaction, and body image as these tend to be greatest during the early postoperative period.[21] A prospective, longitudinal, cohort, 3-month multicenter study found that patients who had consultation with a preoperative ostomy care nurse were positively associated with a greater probability of improvement in patient QOL.[27] The importance of feelings of self-efficacy and the patients' ability to master daily care as a key role in optimal ostomy adjustment was also discussed in 2 studies.[19,24] Successful transition to self-care management is likely to occur with instruction in self-care and psychological support.[24]

Three qualitative papers addressed issues unique to young adults and adolescents. Table 1 provides a complete list of reviewed articles. Notably, the challenges of meeting expected adolescent milestones (searching for independence) while living with an ostomy were discussed.[21]

Adolescents in this study[21] made particular mention of the effect on body image and sense of self attributed to living both with their disease and with an ostomy. Adolescents struggled with deciding when it was appropriate to share with others the presence of their ostomy and articulated the effect this had on relationships, challenges to one's self-esteem, and body image for young people living with an ostomy.[28] Participants in this study[28] identified the difficulty in beginning new relationships as a result of the ostomy. They also spoke of the power of the relationships they had with the nursing staff, noting that the initial reaction from the RN to their stoma was an indicator of how they themselves would feel about the stoma. It was also identified that young people living with a temporary ostomy experienced feelings of embarrassment and frustration due to their ostomy. Individuals discussed the overall effect that living with their disease (ulcerative colitis) had on them, and that to some degree they felt relief with their temporary ostomy.[26]

Question 2: What nurse-led interventions are effective in improving ostomy care and peristomal skin care (eg, reducing degree/frequency of complications, shortening healing time) in neonatal, pediatric, or adult populations?

Fourteen descriptive quantitative studies provided information about the common types of complications, including significant predictors.[19,29-31] Please note that Table 1 provides a complete list of all articles reviewed for this article. The highest peristomal skin complication rates were for irritant dermatitis following a leak and irritant dermatitis as a result of the patient or carer cutting the wafer too large, erosion of the wafer or undermining the wafer.[31] The most frequent stoma-related complications were parastomal hernia, mucocutaneous separation, retraction, prolapse, and stenosis.[32]

Although the findings from a study mentioned previously indicated that there were no significant differences in ostomy complications based on ethnicity, gender, or education, other works found that there was a greater incidence of stoma complications in women.[19] Common predictors of ostomy complications and peristomal skin complications include age (younger than 42 years), ostomy type (ileostomy vs colostomy), reason for ostomy surgery (eg, colon cancer or inflammatory bowel disease), lack of preoperative site marking of stoma, and whether a healthcare provider explained the ostomy prior to surgery.[19,31] Other significant predictors of peristomal skin complications included "overactive" stoma, body mass index greater than 30, and the use of a flat, 1-piece ostomy appliance.[29,31] Patients with a problematic stoma or complications are more likely to have delayed hospital discharge, experience an inability to participate in the care of their stoma, and face greater risk of hospital readmission.[29,30] Knowledge and understanding of predictors of complications can facilitate the identification of educational needs and organization of stoma care.[31,32]

There were 3 studies that described tools to assist nurses with diagnosing and choosing treatment of ostomy complications.[32-34] Jemec and colleagues[34] evaluated the inter- and intranurse assessment variability of the ostomy skin tool and found the tool to be a reliable and accurate instrument that provides common language to describe the extent of severity and possible cause of peristomal skin disorders. Kalashnikova and colleagues[33] evaluated algorithms that assist practitioners to diagnose and treat ostomy complications. These researchers found that the algorithm enabled practitioners to assess the nature of the ostomy complication and determine the type of treatment needed to manage peristomal skin disorders and stoma complications without physician assistance. Finally Bryan and Dukes[35] evaluated an enhanced recovery program and found a reduction in stress response after ostomy surgery and a faster recovery and shorter hospital stays. Findings from this evaluation indicated that all the patients who participated in the enhanced recovery program benefited from the evidence-based pathway of care.[35] The researchers noted that the success of the enhanced recovery program was largely a result of positive multidisciplinary team approach.[35] No studies were found that targeted interventions to neonatal or pediatric patients with ostomies.

There were no qualitative studies addressing this question.

There was 1 systematic review to address this research question.[34] The paper discussed the role that stoma irrigation played in managing complications of one's ostomy. This work found that the literature was not extensive but what had been published identified irrigation as a safe means of caring for one's ostomy and decreasing unpleasant complications.

Question 3: What nurse-led interventions are effective in promoting patient self-care of ostomy and peristomal skin in pediatric or adult populations?

Four studies described and evaluated different appliances and interventions that promoted patient self-care of ostomy and peristomal skin in the adult population.[36-38] Two of these studies evaluated type of ostomy appliance and its ability to address areas that may be important to the QOL of people with stomas, including appliance changes, stool seepage, overfilling, patient mobility, odor management, pouch flexibility, adhesiveness, and erosion.[36,37] It was found that the "Fistula and Wound Management System" provided an effective pouching seal with good protection to the perifistular skin.[37] The pouch wear time was longer than previously used pouching systems, and patients reported increased comfort and mobility when using the pouch. Two new, 2-piece ostomy appliances with mechanical couplings were evaluated

(both from the SenSura range by Coloplast). According to the findings, SenSura performed better than the reference appliances on QOL indicators.

One study by Carlsson and colleagues[38] evaluated nurse-led interventions such as the practice of colostomy irrigation (CI) and the effect that positive and negative aspects of this practice had on patients' perspective. Patients reported that CI improved self-esteem and intimacy. Fifty-six of the participants also described negative aspects of CI, including the time required to perform CI and the need for prolonged occupation of the toilet. These factors contributed to emotional distress and negatively influenced successful irrigation. However, almost all of the participants in the study described positive aspects of CI, including promotion of feeling secure and maintaining an empty pouch.

There were no qualitative or systematic reviews that addressed this question.

Question 4: What nurse-led interventions are effective in managing complications in ostomies and peristomal skin in neonatal, pediatric, or adult populations?

There were 12 quantitative studies that were considered in the context of this research question.[39-42] A complete list of reviewed articles is provided in Table 1. A retrospective chart analysis by Sung and colleagues[39] describes peristomal irritant dermatitis and allergic contact dermatitis as the most frequent ostomy-related complications in the study population of 1170 patients. The chart analysis also indicated that women showed significantly higher incidences of peristomal hernias, flush stomas, and retracted stomas than men.[39] This finding is consistent with the findings from a study cited in Q2, which also found a higher incidence in ostomy-related complications in women.[35] Obesity was associated with a higher incidence of several stomal and peristomal complications. Careful attention to the position and height of the stoma in patients with abdominal obesity as well as comprehensive education, including exercise and diet, is warranted for weight control and prevention of stomal and peristomal complications in obese persons. Sung and colleagues[39] recommend education for preventing irritant contact dermatitis, such as proper pouching and peristomal skin protection, and weight control should be emphasized in a self-care program for persons living with an ostomy.[43] Furthermore, the importance of preoperative counseling and education for patients and their family by an enterostomal therapist or WOC nurse as a key element of supportive care was supported in the literature.[40,41] Osifo and colleagues[41] found that adequate preoperative counseling of parents/caregivers, good stoma care, and early stoma closure gave encouraging results.

The study by Nybaek and colleagues[40] examined the skin barrier function in persons with ostomies and its sensitivity in relation to the presence of any kind of peristomal skin problems. The researchers found that the use of the stoma appliance affects the skin barrier adversely in all patients. Furthermore, by changing from a single-component ostomy appliance to a 2-component system, the frequency of changing the base plate adherent to the skin surface is reduced and skin problems are often better controlled.

Both Whiteley and Sinclair[32] and Pittman and colleagues[13] describe preoperative marking to reduce ostomy complications and peristomal skin complications. In addition, preoperative marking by a WOC nurse is needed to reduce the prevalence of flat (flush) stomas.[40] The importance of proper education and support for new ostomates to ensure that they recognize and know how to treat peristomal complications was also discussed.[43]

There were no qualitative studies or systematic reviews that addressed this question.

Question 5: What are the special considerations in caring for individuals with ostomies who have special needs, including blindness?

There were 3 quantitative studies considered for this research question. Mahjoubi and colleagues[44] assessed the nonpsychotic psychiatric disorders of stoma patients in Iran. Findings from this study indicated that the most significant ostomy complications that increased the General Health Questionnaire scores (a measure of mental health) were mucosal hemorrhage and stomal stenosis. Interestingly, the General Health Questionnaire score did not have any significant correlation with patient age and duration of the disease before construction of the ostomy but had a significant correlation with duration of having a stoma.[44]

Wilson and Kerr[45] assessed the challenges in helping those with back pain cope and manage their stomas. They found that women were more likely to have back pain, and those with a colostomy experienced more back pain than those with an ileostomy.[44]

Symms and colleagues,[24] as discussed in Q1, focused on male veterans' sexuality following ostomy. They note that these individuals faced challenges postoperatively in initiating intimate relationships. Those who had been in relationships prior to their surgery reported less difficulty than those who had not.[24]

There were no qualitative studies or systematic reviews included for this question.

Question 6: What are the education needs of nurses looking after individuals with ostomies?

Two studies were considered in the context of this research question.[45] Gemmill and colleagues[46] describe acute care oncology nurses' knowledge about and attitudes toward providing direct ostomy care support and education. The results of this study showed that the participants have a fair working knowledge of the principles of ostomy care; however, only 30% of respondents agreed that there is adequate staff education or in-service opportunities to keep knowledge up-to-date on ostomy care.[46] Resources

needed to provide improved patient care were described by respondents and included an information booklet, an instructional video, demonstration of care, and follow-up in the home by nurses.[46] Respondents described perceived barriers to patient education to include patient barriers as well as challenges related to current limited hospital stays.[46]

There were no qualitative studies or systematic reviews included for this question.

Question 7: What patient-focused educational interventions are effective in improving physical and psychosocial status of individuals with ostomies?

A study by Culkin and colleagues[48] evaluated an intervention based on personalized nutrition advice incorporating the use of an information booklet for patients with chronic intestinal failure. This study demonstrated that personalized nutritional advice, when tailored to specific requirements in conjunction with an information booklet, significantly improves knowledge of the chronic intestinal failure regimen.[48] Furthermore, patients who reduced their frequency of infusions showed an improvement in the EQ-5D index and SF-36 (36-item Short Form Health Survey) physical functioning compared with those who maintained infusion frequency.[48]

There were no qualitative studies or systematic reviews included for this question.

Question 8: What resources used by nurses in ostomy care are most effective in managing ostomies (eg, promoting healing, reducing complications)?

A randomized experimental study by Lo and colleagues[49] compared the costs and effectiveness of enterostomal education using a multimedia learning education program (MLEP) and a conventional education service program (CESP). This study demonstrated that using MLEP to educate individuals with a newly formed stoma provides a cost saving over CESP.[49] Moreover, the patients in the MLEP group showed significantly greater improvement in knowledge of self-care, attitude in self-care, and behavior in self-care than those in CESP.[49] Therefore, the effectiveness of MLEP over CESP has been demonstrated by this study.[49]

There were no qualitative studies or systematic reviews included addressing this question.

Question 9: What resources used by patients in self-managed ostomy and peristomal care are most effective in managing ostomies (eg, promoting healing, reducing complications)?

No studies were found in any sections that addressed this research question.

Discussion

The objective of this review was to fashion recommendations based on the best available evidence to create a guideline for registered nurses and registered practical nurses with respect to ostomy care and management. This review highlights research evidence that may facilitate nurses' understanding of the experience of living with an ostomy, including the complications that may be experienced, overall QOL, physical and psychological impacts, and self-care practices used to facilitate adaptation. Unfortunately, despite the common assumption across the literature that nurses were primarily involved in the preoperative, postoperative, and follow-up care of individuals requiring ostomy care, there was minimal empirical research to support nurses' assessment or management of stomas and peristomal skin.

A major gap in the literature reviewed was that although some of the assessments and interventions in the studies were delivered by nurses, the particular provider (and degree of skill of the provider) was often unclear. As none of the studies focused on the effectiveness of different providers, it is difficult to evaluate whether generalist nurses, specialized nurses, or other healthcare providers (eg, physicians, dieticians, social workers) would be more effective, and inherent to, the delivery of specific interventions. Although identified as a gap, there was some evidence to support clinical interventions for nurses in specialized practice (eg, enterostomal therapists, nurse practitioners) who may make recommendations for equipment or pharmacological treatments of complications, such as peristomal dermatitis.

There were several strengths to this review, the first of which is the systematic process undertaken to search, select, and review available studies. Moreover, in light of the lack of experimental data regarding ostomy care and management within the nursing scope of practice, the inclusion of various research designs was essential to understanding the available body of evidence within this topic area. There was some evidence that can facilitate nurses' understanding of the physical and psychosocial impact of living with an ostomy, as well as commonly initiated self-care practices used to facilitate adaptation. However, the literature review did uncover various bodies of evidence that provide some direction for future nursing practice and research.

The findings of this review should be considered in light of several limitations. First, the broad nature of our initial research questions may have limited our ability to identify much-focused studies. However, a broad search was necessary to uncovering the breadth of literature related to nursing practice in this area. The secondary search conducted of this topic did identify more recent evidence; however, it is clear that information addressing the needs of pediatrics, adolescents, and their families is lacking.

Conclusion

This systematic review provided the best available evidence up to 2011 to create evidence-based recommendations

related to the assessment and management of patients with an ostomy, including the assessment and management of the peristomal skin. While there is increasing evidence to support recommendations in some cases, it is clear that there remain gaps in the literature, and reveals areas in need of further research.

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APPENDIX

Instruments Used to Assess Methodological Quality

The following resources were used to guide the critical appraisal of the articles reviewed:

- Qualitative studies

  "10 questions to help you make sense of qualitative research"[50]

- Quantitative studies

  Cohort/Observational: "12 questions to help you make sense of a cohort study"[51]

  Randomized Controlled Trials/Quasi-Experimental: Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies[52]

- Systematic reviews:

  Assessment of Multiple Systematic Reviews (AMSTAR)[53]

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