A patient admitted to the hospital for ostomy surgery may experience anxiety, fear, depression, body image impairment, anger, and denial. By building a close relationship with their patients, nurses may be able to identify these feelings and provide needed encouragement, support, and counseling to help patients learn how to integrate independent ostomy care into their daily activities. This encouragement is most often provided by the bedside nurse. For this reason, having a nurse who is confident and knowledgeable in providing ostomy care can make the difference between a positive or negative outcome and may play a significant role in the patient’s satisfaction with the care received while in the hospital.

The rehabilitation of ostomy patients is dependent on their ability to provide self-care. This ability is directly related to the quality of care received from the bedside nurse, as well as the quantity and the consistency of patient teaching. Several aspects of the US health insurance and payment system have influenced ostomy teaching in hospitals today and include decreased length of stay and early discharge for continued recovery. As a result, ostomy teaching is frequently provided by nonspecialized clinicians who may not be familiar with state-of-the-art care and new products and subsequently may lack the necessary insight to provide cost-effective ostomy care. Fragmented teaching is yet another problem — ie, the patient may be taught certain techniques at the hospital that may not be consistent with instructions from the postdischarge health-care provider.

In order to standardize care and provide the ostomy patient with the necessary skills to independently manage their ostomies, a teaching tool for the bedside nurse that provides the patient with consistent education and basic skills for ostomy care needs to be developed. Standardizing ostomy education will help patients learn effective techniques that will assist in maintaining independence throughout the care continuum. Plus, the development of an easily accessible learning resource for nurses will promote autonomy to meet individual educational needs. Finally, a healthcare institution should promote autonomy among its nurses to nurture confidence. Autonomy permits and expects the nurse to practice independently and consistently within professional standards.

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**Abstract**

Fragmented teaching and ostomy care provided by nonspecialized clinicians unfamiliar with state-of-the-art care and products have been identified as problems in teaching ostomy care to the new ostomate. After conducting a literature review of theories and concepts related to the impact of nurse behaviors and confidence on ostomy care, the author developed a computer-based learning resource and assessed its effect on staff nurse confidence. Of 189 staff nurses with a minimum of 1 year acute-care experience employed in the acute care, emergency, and rehabilitation departments of an acute care facility in the Midwestern US, 103 agreed to participate and returned completed pre- and post-tests, each comprising the same eight statements about providing ostomy care. F and P values were computed for differences between pre- and post test scores. Based on a scale where 1 = totally disagree and 5 = totally agree with the statement, baseline confidence and perceived mean knowledge scores averaged 3.8 and after viewing the resource program post-test mean scores averaged 4.51, a statistically significant improvement (P = 0.000). The largest difference between pre- and post test scores involved feeling confident in having the resources to learn ostomy skills independently. The availability of an electronic ostomy care resource was rated highly in both pre- and post testing. Studies to assess the effects of increased confidence and knowledge on the quality and provision of care are warranted.

**Key Words:** stoma, cohort study, staff nurse confidence, education, electronic resources

**Index:** Ostomy Wound Management 2010;56(5):60-69

**Potential Conflicts of Interest:** none disclosed
The author, seeing a need for a computer-based resource composed of step-by-step instructions on managing fecal and urinary ostomy pouches, developed a program that was added to the hospital’s computer system for clinicians in need of ostomy care instructions. To assess the value of the resource, pre-/post-tests were completed to answer the following questions: 1) Do nurses feel more confident providing ostomy care after completing a computer-based training session regarding ostomy care? 2) Do nurses feel that having a resource for reference will help them maintain their ostomy care skills? 3) Do nurses feel that having a computer-based learning resource will provide them with autonomy to meet their ostomy care training needs?

**Literature Review**

The terms *ostomy* and *stoma* are general descriptive terms often used interchangeably, although they have different meanings. According to the Wound, Ostomy, and Continence Nurses Society, an ostomy is a surgically created opening in the body for the discharge of body wastes; a stoma is the actual end of the ureter or small or large bowel that can be seen protruding through the abdominal wall. Ostomy surgery is performed on persons of all ages, from newborns to the elderly. This type of surgery is necessary to remove part of the bowel or bladder due to disease or trauma.

According to Ringhofer, the three major types of ostomy surgery are colostomy, ileostomy, and urostomy. A colostomy involves the movement of the large intestine through the surface of the abdomen. Indications include cancer, diverticulitis, Hirschsprung’s disease, imperforate anus, and trauma. In an ileostomy, part of the small intestine (ileum) is brought to the surface, often following removal of the entire colon and rectum to treat Crohn’s disease, familial adenomatous polyposis, or ulcerative colitis. A urostomy is created when the flow of urine must be diverted because a portion of the urinary tract is cancerous or nonfunctional. Urostomy surgery also is indicated for birth defects such as spina bifida and spinal cord injuries.

According to Gemmill et al., bladder cancer is the most common cancer requiring a urinary diversion. In the US, bladder cancer is the fourth most common cancer in men and the eighth most common among women, with approximately 68,900 estimated new cases in 2008. Junkin and Beitz found the incidences of cancers that may result in an ostomy are increasing in at an alarming rate; the top five most commonly diagnosed cancers in men in the US include prostate, colorectal, and bladder cancer and in women include colorectal, uterine, and ovarian cancers. In 2005, the American Cancer Society estimated a diagnosis of 106,700 new cases for the following year.

Current statistics estimate that 450,000 people in the US have a stoma and 120,000 new surgeries are performed each year. Numbers of the three major types of ostomy surgeries are distributed fairly equally — colostomy 36.1%, ileostomy 32.2%, and urostomy 31.7%. Turnbull notes the average age of the person with an ostomy is 68.3 years; because US women have a higher average life expectancy than men, it could be presumed that more women than men have an ostomy. As the population ages, the medical community will see an increase in the number of patients with prostate, bladder, colorectal, and gynecologic cancers as well as other diseases for which ostomy surgery is indicated.

Nursing care for ostomy patients has evolved from the bedside nurse to an enterostomal therapist (ET) nurse who is typically responsible for outcomes, but usually the bedside nurse provides the first line of care before responsibility transfers to a home health nurse. Bedside nurses must have resources available to help keep their ostomy care skills sharp. At the very least, the nurse should be able to apply, remove, and empty the ostomy pouch. The nurse also should be able to teach these skills to the new ostomy patient.

Fitting the new ostomy patient with the appropriate appliance may become a challenge for the bedside nurse, especially if he/she has not seen an ostomy for some time. After surgery, the ostomy appliance is fitted according to stoma size and abdominal location, type and amount of effluent, and individual and patient characteristics, including visual acuity and manual dexterity. Ensuring the appliance is fitted properly will help keep the patient’s peristomal skin intact. The accurate measurement of the stoma is an important step that nurses tend to miss; for this reason, educating the nurse with regard to the proper technique to measure the stoma is imperative to obtain a proper seal. Patients expect the nurse to be knowledgeable, competent, and willing to provide care and necessary information. Clearly, the development of training tools for the nurse is important if knowledgeable nursing care is expected to translate into quality care.

Persson et al. developed a questionnaire for a study group comprised patients who had undergone a colostomy for rectal cancer or an ileostomy for ulcerative colitis, all attending a stoma outpatient clinic. Quality of care was assessed using the identity-oriented dimension of a validated questionnaire. Forty-two ileostomy and 49 colostomy patients completed the questionnaire. The study found that 71% of ileostomy patients and 43%...
of colostomy patients developed stoma-related complications. Additionally, the study data suggested that one third to one half of patients reported their care did not meet their expectations.

Some accessories, such as belts, binders, paste, strips, or rings are helpful to obtain a proper seal. These accessories are mostly used by patients experiencing problems with their stoma, patients who depend on the nurse’s expertise to help them problem-solve in a prompt manner to avoid prolonged complications. Often, it is the bedside nurse who decides whether some accessories are needed based on the patient’s stoma size and shape; the wrong decision can lead to complications.

Most new ostomy patients predominantly want information on the practical aspects of caring for their stoma. The best way to teach new patients is to show them how to change the pouch and explain the process step by step, especially in the first 2 to 3 days following surgery. One challenge the nurse may face is the lack of a continuously available resource to maintain the necessary information to provide good care to ostomy patients, care that involves skills not used as frequently as other nursing skills and up-to-date knowledge of products. Nurses may think they do not have the resources to provide the care and education required by their patients but when resources are available for nurses to increase their knowledge and expertise in these situations, professional autonomy is promoted. In fact, the need to increase knowledge and expertise is the

<table>
<thead>
<tr>
<th>Table 1. Pre- and Post-test questionnaire results</th>
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<tr>
<td>You feel confident about your ostomy care skills.</td>
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<td>Pre-test</td>
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<tr>
<td>You feel confident about your ostomy care skills.</td>
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<tr>
<td>If you were assigned to care for an ostomy patient today you would know the first step to provide ostomy care.</td>
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<tr>
<td>You feel that you have the resources available to learn your ostomy care skills independently.</td>
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<tr>
<td>You believe that your ostomy patients would be satisfied with the ostomy care you can provide.</td>
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<tr>
<td>You feel that having an electronic ostomy care learning resource will help you maintain your ostomy care skills up-to-date.</td>
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<tr>
<td>If you had to change an ostomy pouch today, you would be confident that you know what to do.</td>
</tr>
<tr>
<td>It would be a good idea to have an electronic resource available to help you review ostomy care skills when you feel you need it.</td>
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<tr>
<td>You believe that having an electronic ostomy care resource available will increase your autonomy to learn ostomy care skills.</td>
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* Score range 1 (totally disagree) to 5 (strongly agree)
driving force behind autonomy. Autonomy stimulates the nurse to exercise independent judgment in their daily pursuit of positive patient outcomes.18

Thus, it is necessary to provide ways for nurses to independently access learning tools in the clinical area to reinforce their knowledge in order to provide better care to patients. Different instructional methods are available to teach nurses ostomy care. A group of nurse specialists developed an interactive learning program for stoma care nursing.19 This program allows for the staff to have the flexibility to learn at their own pace by using the internet, or via a CD-ROM or DVD. Other areas of nursing have used computer-based training resources to effectively teach nursing staff.20 Moses Cone Health Systems21 developed a computer-based training to teach nurses strategies for pressure ulcer documentation. This program allowed nurses to complete the modules without the assistance of an instructor; they set an independent pace using downtime to complete the modules.

**Theoretical Framework**

The Theory of Modeling and Role-Modeling enables nurses to care for and nurture each client with an awareness of and respect for individual uniqueness.22,23 This Theory defines nursing as the holistic helping of persons with their self-care activities in relation to their health — ie, nursing is an interactive and interpersonal process that nurtures strengths to enable the development, release, and channeling of resources for coping with one’s circumstances and environment.24

Multiple concepts are involved in the Theory of Modeling and Role-Modeling. **Modeling** is the process nurses use to develop an image and understanding of the patient’s world — somewhat like creating a mirror image of the situation from the patient’s perspective. With the ostomy patient, the nurse can practice modeling to accept and understand the patient’s abilities and limitations to perform ostomy care independently.

**Role-modeling** occurs when the nurse plans and implements interventions unique for the client. The nurse with a goal to teach ostomy self-care to his/her patients will develop interventions that facilitate the patients’ learning of the necessary skills at their own pace and within their own model.

The nurse who teaches a patient ostomy self-care will encourage the patient to return a demonstration of the skills learned, recognize the skills that have been mastered, and nurture and encourage the patient to continue to work on the development of skills that are not as strong during the return demonstration.

Burch18 considered each person’s own mind-body relationship and identifiable resource potential that predicts one’s ability to deal with stress. Swain22 explained that a relationship exists between needs status and developmental processes, satisfaction with needs and attachment objects, loss and illness, and health and need satisfaction, a practice model validated and affirmed by Tomey and Alligood24 that helped expand and explain labeled phenomena, concepts, and theoretical relationships.

The goal of nursing in these situations is to assist patients in achieving a state of perceived optimum health and contentment by regaining their independence as they master self-ostomy care. **Nurturance** refers to the act of gently supporting and encouraging the client to integrate all biophysical, cognitive, and affective processes with the goal of developing independence with ostomy care. Similarly, **unconditional acceptance** refers to the ability to use empathy to fully accept the person as worthy, with no strings attached, to facilitate self-ostomy care to his or her own potential.19 In order to achieve this, it is vital to remember that human beings are connected through their holism, lifetime growth and development, and need for affiliated-individuation. Likewise, human beings differ from each other due to different set of genes that, to some extent, will predetermine their appearance, growth, development, and responses to life events. Some people are able to cope with ostomy surgery and self-care very efficiently, while others may never achieve independence with ostomy care.

All ostomates have two basic needs that can be satisfied: pouch application and pouch emptying. These basic needs are only fulfilled from within the framework of each individual ostomate and they are only met when the individual considers them met. The Modeling and Role-Modeling Theory defines affiliated individualism as the need for dependence on support systems, while at the same time, maintaining a certain amount of independence from these support systems.24 The ostomate develops a close relationship with the nurse, who becomes part of his/her support system. The goal of teaching the ostomate self-ostomy care is to support developing independence with that care.

The Modeling and Role-Modeling Theory presents the nurse as a facilitator for the ostomate’s adaptation to the new way he/she must meet the body’s elimination needs. **Adaptation** occurs when the ostomate mobilizes internal and external coping resources to regain his/her self-ostomy care independence. In the ostomate’s case, **self-care** is defined as the use of knowledge obtained from the nurse’s teaching, the use of resources available to them (nurse, family, friends), and action. The ostomate knows what caused the dependence for care and knows what will make him or her independent again.

According to Tomey and Alligood,24 the two last concepts of the Modeling and Role-Modeling Theory are self-care resources and self-care action. For the ostomate, self-care resources represent the mobilization of internal and external resources to help gain, maintain, and promote an optimum level of holistic health. Self-care action means that the ostomate has learned the necessary skills and is utilizing these newly learned skills for self-ostomy care.

**Conceptual Framework**

The conceptual framework for this study was based on nurses’ requests to have higher-quality, easily accessible...
ASSESSING AN OSTOMY TRAINING RESOURCE

Figure 1. Pouch change instruction.

Step 1: Remove old appliance. Cleanse the peristomal skin with plain water and a washcloth. Pat dry. Assess the peristomal skin and the stoma’s appearance and document.

Step 2: Use a stoma measuring guide to measure the patient’s stoma. Select a size that fits comfortably around the stoma without exposing the peristomal skin.

Step 3: Trace the selected size on the back of the ostomy appliance’s barrier.

Step 4: Use curved scissors to cut the appliance along the line you have traced. Point the curve of the scissors inward to facilitate cutting.

Step 5: After cutting the appliance to size, place the appliance over the stoma before removing the protective backing paper that covers the adhesive to make sure you have the correct fit for your patient’s stoma.

Step 6: Remove the protective paper backing from the barrier. Avoid placing your gloved fingers over the adhesive.

Step 7: Make sure the peristomal skin is dry. Apply the barrier over the skin. Rub the surface of the barrier with your fingers to warm up the appliance and help it adhere. Do this for approximately 1–2 minutes.

Step 8: Apply the pouch over the barrier. Make sure it is secure all around to avoid leakage.

Step 9: Close the velcro closure.

learning tools consistently available when they encounter an occasional ostomy patient at a Central Illinois hospital. The ET nurse often is consulted to meet a patient’s needs regarding the basic ostomy care that could easily be provided by the bedside nurse. The development of an electronic resource could meet the nurses’ training needs and will promote autonomy through independent access. The conceptual framework looks as follows:

↑ nurses training in ostomy care
↓
↑ nurses confidence in providing ostomy care
↓
↑ nurses’ autonomy
Methods

Conceptual and operational definitions. According to Adams et al., training is defined as an innovative way to offer individuals the opportunity to develop skills in a defined area of nursing that enhances their own working practice. For the purpose of this study, the main focus of the training consisted of ostomy care in regards to pouch application and pouch emptying. The patient should be shown the steps involved in the emptying and changing of the pouch and encouraged to carry out these steps with assistance and supervision. For the benefit of the patient, the bedside nurse should receive instruction on the performance of these steps; this training may increase nurse confidence in providing ostomy care, which then will transfer to the patient as greater confidence in performing these duties independently, which may effect ostomy patient rehabilitation.

For the purpose of this study, ostomy care is defined as the process involved in the pouch application and pouch emptying. These two skills are the foundation the nurse will need to teach, reinforce, and monitor during the patient’s hospital stay. Confidence is defined as the feelings the nurse has regarding his or her own ability to provide proper ostomy care to patients. Autonomy is defined as the expectation that the nurse will take responsibility to learn the necessary skills to provide ostomy care that is consistent with professional standards; additionally, autonomy refers to the expectation that nurses exercise independent judgment within the context of a multidisciplinary approach to patient care. The completion of the computer-based ostomy care training session was intended to increase the nurse’s confidence when providing ostomy care to ostomy patients as well as increase his/her autonomy in learning ostomy care skills.

Instruments and study design. For the purpose of this study, the independent variable was represented by nurses’ completion of the computer-based ostomy care training session. The dependent variable was represented by the change in confidence and autonomy ratings measured using a pre-test/post-test questionnaire.

The author developed the eight-question pre- and post-test instrument based on the relevant nursing literature reviewed. Using a 5-point scale, nurses were asked to rate their level of confidence with providing ostomy care, the usefulness of electronic resources, and sense of autonomy providing care (see Table 1).

The research was approved by the research committee of Methodist Medical Center of Illinois, a 300-bed community hospital. The computer-based ostomy training module consisted of photographs and instructions used by the author in live training sessions and is based on needs of nurses at her facility. Recognizing that it is difficult for nurses to leave their units for training, the author created a computer-accessible module that the nurses could access as necessary. The module is a simple step-by-step

![Figure 2. Fecal pouch emptying instruction. A fecal pouch should be emptied when it is 1/3 to 1/2 full.](image)
set of instructions that use pictures taken by the author and also provided by Coloplast Corp. (Minneapolis, MN) as a visual aid to show the steps. Nurses with appropriate expertise reviewed the module to validate the instructions and provide feedback (see Figures 1 through 3).

Participants and study implementation. The target population included registered nurses from the acute care setting, emergency department, and the rehabilitation unit of the hospital. The project was reviewed by the research committee and a physician assigned to oversee research at the hospital. Nurses were recruited if they were >20 years of age and had at least 1 year of acute care nursing experience. The researcher distributed a letter throughout the hospital 1 week before the start of the study providing pertinent information about the study and requesting nurse participation. Fifteen participant names from each unit were drawn from a bag containing pieces of paper with the names of all potential participants. Participation was voluntary and confidential. During the recruiting week, a total of 189 registered nurses were asked to participate in the study. Of these, 170 registered nurses agreed and four declined. Of the 170 pre- and post-tests distributed, 103 were returned (60.5%). The study was conducted over 3 months.

Volunteers were instructed to complete the pre-test, use the computer-based ostomy care training resource, and complete the post-test. Participants were given 2 weeks to complete the pre-test, 1 week to review the resource, and 2 weeks to complete the post test. At the completion of these three steps, participants placed the pre- and post-test documents in an envelope in a designated area in their units. The primary researcher collected the documents.

Data analysis. All data were analyzed using the SPSS (Chicago, IL) statistical program. A statistician assisted with data entry and analysis. The means and standard deviations were calculated for each question. Repeated measures multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA) were used to compare participant pre- and post-test ratings.

Results

Differences between pre- and post-test scores were significant. Pre-test scores means ranged from a low of 3.27 (SD 0.899) for question “You feel confident about your ostomy care skills” to a high of 4.43 (SD 0.62) for question “It would be a good idea to have an electronic resource available…” (P = 0.000) (see Table 1). Differences in average scores ranged from .26 on question 7 to 1.1 on question 3 (see Table 1).

Response comments on the post-test were positive and included: “This tutorial was very helpful and not time-consuming”; “This is a good tutorial and I found the new pouch information very helpful”; “Great pictures on the Novel Application Launcher (NAL) tool”; “Having the photos and order numbers were great!”; “A good idea to have a resource to refer to”; “Pictures and directions very easy to follow”; “Since we see so few ostomy patients on our unit, I feel this is really something we can utilize”; “The ostomy care resource would come in very useful for me since I rarely have an ostomy patient”; “Great tutorial”; “I feel this resource is great, I am glad that it is available to us”; “Wonderful tool”.

Discussion

The literature review confirmed that no other research studies addressing the use of a computer-based, step-by-step ostomy care training resource for staff nurses are available.
This is the first ostomy training program that has been developed at this hospital. Study results demonstrated that nurses found the ostomy care computer-based resource helpful in maintaining their ostomy care skills and that it increased their level of confidence and that nurse confidence in their ability to provide ostomy care also increased after reviewing the resource.

Ostomy care skills need to be refreshed and reviewed, especially when the nurse does not care for this type of patient regularly. Having a resource available that may be accessed at any time could enable nurses to maintain skills and ensure they stay up-to-date with the products used at their institution. This also could benefit the patient by standardizing the care provided at this hospital and ensuring that every nurse at a particular institution is learning the same skills.

Strengths and Limitations

Recruitment of nurses from a single hospital is a limitation of this study; it is not known if the results apply to other populations (such as extended care or other acute care facilities with different programs in place). The random selection of participants, large sample size, consistency of the results and expertise of the author/researcher are important study strengths. Although data show that nurse confidence and perceived autonomy increased as a result of this program, the actual effects or the impact of similar programs on the quality of care provided has yet to be established.

Conclusion

The results of a study to assess the impact of a computer-based ostomy care resource demonstrated that providing an opportunity for registered nurses to review their ostomy care knowledge may increase confidence, which appears to be low, in their ability to provide care. The study indicates a need for more/ongoing education regarding ostomy care. Providing easily accessible ostomy care training may improve patient care; more research is needed to find which methods of resource provision are most effective.

References