ORIGINAL ARTICLE



Evaluation of interventions in people with digestive stoma through the Nursing Interventions Classification

Concepción Capilla-Díaz PhD, RN¹ Noelia Moya-Muñoz MSc, RN² José Manuel Matas-Terrón MSc, RN² María Ángeles Pérez-Morente PhD, RN³ María Adelaida Álvarez-Serrano PhD, RN⁴ Rafael Montoya-Juárez PhD, RN⁵ César Hueso-Montoro PhD, RN⁶

- ¹ Department of Nursing, Faculty of Health Sciences, University of Granada, Granada, Spain
- ² Virgen de las Nieves University Hospital, Granada, Spain
- ³ Department of Nursing, Faculty of Health Sciences, University of Jaén, Jaén, Spain
- ⁴ Department of Nursing, Faculty of Health Sciences, University of Granada, Ceuta, Spain
- ⁵ Department of Nursing, Faculty of Health Sciences, University of Granada, Granada, Spain
- ⁶ Department of Nursing, Faculty of Health Sciences, University of Granada, Granada, Spain

Correspondence

César Hueso-Montoro, Faculty of Health Sciences, University of Granada, Granada, Spain. Avda/Ilustración N° 60 18016 (Granada - SPAIN).

Email: cesarhueso@ugr.es

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Abstract

Purpose: To determine which nursing interventions are used in individuals with a digestive stoma and the relationships between nursing interventions used and sociodemographic and clinical variables.

Methods: The present study is an observational, cross-sectional, descriptive. Data from 102 individuals in the general surgery unit of a first-level hospital (University Hospital Complex of Granada, Spain) were analyzed. Data on the use of nursing interventions and sociodemographic and clinical variables were collected. Univariate, bivariate, and multivariate data analyses were conducted.

Findings: Interventions: Decision-Making Support (5250) and Ostomy Care (0480) were the most prevalent interventions in the sample. The period of care (postoperative and follow-up) was the most common significant variable (p < 0.05) among the interventions observed. Anxiety Reduction (5820), Nutritional Counseling (5246), Self-Esteem Enhancement (5400), and Body Image Enhancement (5220) were also relevant findings.

Conclusions: The present study contributes to determining which nursing interventions are used in individuals with a digestive stoma.

Implications for nursing practice: This study could be useful in planning nursing interventions in individuals with a digestive stoma.

KEYWORDS

colostomy, ileostomy, ostomy, standardized nursing terminology

INTRODUCTION

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A digestive stoma is a surgically created opening in the abdominal wall that results in the external diversion of faeces and urine. An ostomy may be permanent or temporary, and each procedure results in a stoma, which is the end of the small or large intestine that can be seen protruding through the abdominal wall (Registered Nurses' Associa-

tion of Ontario, 2019). Stomas are used for therapeutic purposes in different conditions, such as inflammatory bowel disease or abdominal trauma, but most frequently in colorectal cancer (Martín-Muñoz et al., 2018). In Europe, colorectal cancer is the most common type of cancer and the second leading cause of mortality in both sexes, with 446,000 new cases diagnosed each year (EU Science Hub, 2020; Siegel et al., 2017). In Spain, colorectal cancer was the second leading cause of

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mortality in 2018 (Instituto Nacional de Estadística, 2019). The number of new cases is estimated to be around 277,234 for both sexes in 2020 (Sociedad Española de Oncología Médica, 2020).

Stoma creation is associated with a change in the lives of individuals. This change has a great impact and influences virtually all areas of life (Hoon et al., 2013; Whitehead & Cataldo, 2017). Psychologically, the individual experiences fear and concerns which may create a sense of loss, stress, anxiety, and depressive symptoms of uncertainty throughout the process (Capilla-Díaz et al., 2019; Peng et al., 2019). Among other aspects, these changes may affect the way people dress, their daily activities, and their sexual relations due to their physical change, which may act both as a physical as well as psychological barrier (Ayaz-Alkaya, 2019; Paula et al., 2012). This is associated with other issues, such as tiredness, sleeping difficulties, discomfort, or pain (Carmack et al., 2011; Vonk-Klaassen et al., 2016). As a result, having a digestive stoma is a state where both patients and families have experienced a negative change in their lives and where the family becomes essential for coping with these changes (Silva et al., 2017).

From the moment patients are informed of surgery until they are discharged, as well as throughout the period of continuity of care, the role of nurses is essential to support and monitor the entire process (Buckle, 2014; Burch, 2017a; Comb, 2003; McGrath, 2017). These professionals are crucial in educating patients on self-care and in preparing them for the entire process by resolving their concerns as often as necessary, by involving their families, providing coping strategies, and monitoring them to ensure that patients' needs are met (Capilla-Díaz et al., 2019; McGrath, 2017; Nascimento et al., 2011; Sampaio etal., 2008; Silva et al., 2017).

Patients and families must have sufficient knowledge to deal with this process, as well as all the support necessary to respond to any potential complications. Problems after surgery, such as anastomotic leakage, surgical site infection, or skin problems around the stoma itself, may be the source of major complications that reduce the patient's quality of life, resulting in a negative impact on survival rates (Aoyama et al., 2017; Burch, 2014; da Silva et al., 2014; Zhang et al., 2019). Understanding and weighing up the nature and consequences of treatment based on personal values is thus an important part of the journey of cancer (McNair et al., 2019). Therefore, nurses are a perfect reference point for both patients and families when it comes to ensuring knowledge of self-care and adaptation to the new situation with the highest possible quality of life (Capilla-Díaz et al., 2019).

NURSING INTERVENTIONS CLASSIFICATION INTERVENTIONS

Having standardized languages available provides nurses with benefits associated with improved communication, assistance in patient care delivery, increased visibility of the nursing profession through nursing interventions, nursing practice outcomes, and the education of future nurses. The Nursing Interventions Classification (NIC) is a standardized nursing language that has been translated into nine languages and used to explore and describe nursing practice in a variety of nursing

practice specialties, patient groups, and healthcare settings (Butcher et al., 2019; Hahn, 2014).

Spanish regulations on the minimum dataset for clinical reports in the Spanish national healthcare system (Boletín Oficial del Estado, 2010) specifies the NIC taxonomy as the recording language to be used in nursing care. Several studies have examined NIC interventions for nurses whose practice is with patients with a digestive stoma according to the NIC system (Ayik et al., 2018; Carvalho et al., 2018; Cots & Villalba, 2011; Medeiros et al., 2017).

However, we found no studies describing advanced nursing practice using NIC interventions with individuals with digestive stoma relating the NIC to sociodemographic and clinical factors. In this sense, the purpose of this study is to determine which NIC interventions studied in digestive stoma patients when they are assessed may best be considered, and to analyze which sociodemographic and clinical factors are associated with these interventions.

METHODS

Design

This study used a cross-sectional descriptive design.

Setting

This study was conducted at the general surgery unit of the University Hospital Complex of Granada (Spain). This unit includes postoperative and follow-up areas, and, as such, provides care to patients from surgery to discharge. This unit also includes 82 hospital beds and five operating theatres (two of them for surgical emergencies). Patients who undergo either scheduled or urgent ostomy surgery are cared for at this hospital, which also includes a follow-up care unit after discharge.

Sample

The study population included patients with a digestive stoma who were admitted for a surgical intervention or who were receiving continued care. The exclusion criteria were as follows: patients under 16 years old (in whom stomata are rare), patients with cognitive problems that may hinder their assessment, and patients who did not wish to participate. Consecutive sampling was used until 102 subjects had been recruited. Data were collected between February and April 2017.

Ethical considerations

This study is part of a larger research project approved by the Research Ethics Committee of the province of Granada (Spain) under file number PI-0564-2011. Each patient received an information sheet with the research objectives. All participants gave their informed consent before being included in the study. Data were handled with utmost confidentiality and patient information was anonymized using

TABLE 1 Nursing Interventions studied

Energy Management (0180)	Skin Surveillance (3590)	Coping Enhancement (5230)	Hope Instillation (5310)	Support System Enhancement (5440)	Family Process Maintenance (7130)
Bowel Management (0430)	Behavior Modification (4360)	Nutritional Counseling (5246)	Mood Management (5330)	Teaching: preoperative (5610)	Family Support (7140)
Ostomy Care (0480)	Self-Modification Assistance (4470)	Sexual Counseling (5248)	Security Enhancement (5380)*	Anxiety Reduction (5820)	Family Therapy (7150)
Nutrition Management (1100)	Socialization Enhancement (5100)	Decision-Making Support (5250)	Enhancing Self-Esteem (5400)	Family Integrity Promotion (7100)	Resiliency Promotion (8340)
Improving Sleep (1850)	Body Image Enhancement (5220)	Grief Work Facilitation (5290)	Spiritual Growth (5426)	Family Involvement Promotion (7110)	

^{*}This intervention was included in the previous edition of the Nursing Interventions Classification Source: the authors.

identification codes. The nurse in charge of data collection guaranteed the confidentiality of the information obtained.

Instruments and study procedures

Each patient was assessed in the unit itself. For this purpose, a notebook was prepared containing instructions, ethical considerations, the list of variables, and the interventions selected for analysis. The data were collected in a brief interview conducted by a nurse with experience in stomal therapy and NIC terminology. During data collection, the nurse introduced themselves to the patient, explained the purpose of the study to them, requested their participation in the study, and handed them the informed consent form to sign. No patients refused to participate. Both the responses and the clinical judgement of the nurses were used to determine the presence or absence of each intervention. Once the patient had been assessed by the first nurse, the nursing supervisor of the gastroenterology ward, an expert in stomal therapy, examined and verified the selected data. The supervisor was chosen as the second assessor because of her expertise and knowledge of the patients being assessed, in addition to being in the position of supervising visits during the continuity of care period.

Measures

The following sociodemographic and clinical variables were collected: age (years), sex (male/female), membership in a patient association (yes/no), family member with an ostomy (yes/no), stoma site marking (yes/no), medical diagnosis (oncological/nononcological), time with stoma (in the last year/more than a year ago), and period of care (post-operative period and follow-up period). The postoperative period of care began when the patient was discharged from the recovery and ended when the patient was discharged from the hospital. Then, the follow-up period began.

The selection process of these interventions and the list itself were based on a previous qualitative meta-synthesis on the experiences of

patients with digestive stoma (included studies covered the period 2002–2015) (Capilla-Díaz et al., 2019). Subsequently, the list was reviewed by three experts in nursing methodology and a stomal therapy nurse. Finally, the interventions (Table 1) were used for developing the final care plan. This care plan was based on the findings of the meta-synthesis. Following the methodology described in the nursing process, this care plane included the NANDA-I Diagnosis, Nursing Outcomes Classification (NOC) and their corresponding Nursing Intervention Classification (NIC). Both the diagnoses, the interventions and the results were also studied in the patients included in this study. In this article, the results are referred to the interventions.

Data analysis

The data were collected in a Microsoft Excel database and subsequently, for data analysis, exported to the R Commander program and the IBM Statistical Package for the Social Sciences (SPSS), version 23. For continuous variables, a univariate analysis was performed and means and standard deviations were calculated. Frequencies and percentages were used for categorical variables. The bivariate analysis was performed using Student's *t* test to compare each intervention in relation to age. The chi-squared test was used to compare each intervention with the rest of the factors. The contingency tables and the chi-squared test were used to contrast the rest of the variables with each NIC intervention. Fisher's exact test was used when the conditions required for the previous test were not met.

The aforementioned analysis showed that the factor that was most significantly associated with the highest number of interventions was the period of care. The analysis was completed by designing multiple logistic regression models to confirm these associations, adjusting for age and sex. These adjustment variables were chosen for their relevance to sociodemographic and clinical data. Once the relationship between the statistically significant variables had been obtained, the adjustment conditions were verified.

The odds ratio (OR) with a 95% confidence interval (CI) was calculated as a measure of effect size.

Once the relationship between the statistically significant variables was ascertained, the adjustment conditions were checked. The presence of collinearity between variables was explored by calculating the variance inflation factor (VIF), with a VIF value less than 2.5 indicating absence of collinearity. The linearity between the dependent variable and age (the only independent variable in the model) was assessed using an aggregated variables graph; calibration, which is reflected by the absence of statistically significant differences (p > 0.05) between the observed values and the expected values according to the model, was determined using the Hosmer–Lemeshow goodness of fit test. Finally, the discrimination criterion of the model was assessed by calculating the area under the ROC curve, considering an area greater than 0.7 to be valid. The statistical significance threshold for all tests was set at p < 0.05.

RESULTS

Sociodemographic and clinical characteristics of the sample

The mean age of the patients studied was 62.57 years (SD = 11.30, range = 33–84). The sample was distributed homogeneously by sex, with 52 (51%) males and 50 (49%) females. Seven (6.9%) patients were members of an ostomy association. Sixteen (15.7%) patients had a family member with digestive stoma. Regarding the diagnostic indication for the stoma, 82 (80.4%) patients had cancer. Ninety (88.2%) patients had undergone ostomy surgery in the past year. Finally, 45 (44%) patients were in postoperative care, and 57 (56%) were in follow-up care. Stoma site marking had been performed in 84 (82%) patients.

Interventions and associated factors

Of the 29 NIC interventions included in this study, "Decision-Making Support (5250)" and "Ostomy Care (0480)" were present in all cases, whereas "Hope Instillation (5310)," "Support System Enhancement (5440)," "Family Involvement Promotion (7110)," "Behavior Modification (4360)," "Teaching: Prescribed Activity/Exercise (5612)," "Mood Management (5330)," and Family Integrity Promotion (7100) were not present in any of the participants. Of the rest of the patients, more than 50% had "Sleep Enhancement (1850)" and "Skin Surveillance (3590)", whereas less than 50% of them had the rest of the interventions.

The bivariate analysis (Table 2) showed significant associations found, highlighting the variable period of care and the interventions.

By adjusting this association by age and sex through logistic regression (Table 3), it can be observed that the association remains significant for "Anxiety Reduction (5820)," "Nutritional Counseling (5246)," "Self-Esteem Enhancement (5400)," and "Body Image Enhancement (5220)." The rest of the associations were discarded due to loss of statistical association. This was the case with Family Process Mainte-

nance (7130), "Security Enhancement (5380)," "Nutrition Management (1100)," Self-Modification Assistance (4470), and "Sexual Counseling (5248)." Other associations were discarded due to problems with the linearity criterion, as in the case of Skin Surveillance (3590), "Resiliency Promotion (8340)," and "Socialization Enhancement (5100)." Thus, using the postoperative period with respect to that of follow-up care as a reference, the probability of being present was higher for the interventions Anxiety Reduction (5820) (OR = 0.11), Nutritional Counseling (5246) (OR = 0.30), and Self-Esteem Enhancement (5400) (OR = 0.32), whereas the probability was lower for the intervention Body Image Enhancement (5220) (OR = 2.92).

DISCUSSION

The aim of this study was to determine which NIC interventions are used in patients with digestive stoma and to identify their associations with sociodemographic and clinical variables. Two interventions were present in all subjects: Decision-Making Support (5250) and Ostomy Care (0480). It seems reasonable that care plans for patients with digestive stoma should include these interventions for better adaptation to and improvement of the stoma, as this is essential for the individual to be able to return to their daily life (Silva et al., 2017; Souza et al., 2016). All this, from a psychological, social, and biomedical approach, justifies the presence of these NIC interventions, which play a crucial role in care plans. However, this may not be exclusive to the individual and may include family support (McDonald et al., 2017; Silva et al., 2017). Regarding the intervention Ostomy Care (0480), selfcare is crucial and represents an essential need for this type of patients both during the post-operative and the follow-up periods of care (da Silva et al., 2014; Ran et al., 2016; Silva et al., 2018). With respect to the intervention Skin Surveillance (3590), counselling and proper management of drainage bags is key to preventing complications (Hill, 2020; Kundal & Bøgebjerg, 2008). As pointed out by previous studies, it is of paramount importance to avoid skin damage and monitor for possible signs of infection after each intervention (Burch, 2014, 2017b). The rest of the NIC interventions analyzed were heterogenous and particularly significant.

In relation to "Coping Enhancement (5230)," it may be safe to say that the process of having a digestive stoma fitted is considered to be a stressor disrupting the daily life of individuals and is perceived as threatening due to the number of changes that ensue (Brown, 2017; Carmack et al., 2011; Hueso-Montoro et al., 2016; Nascimento et al., 2011; Silva et al., 2017; Vonk-Klaassen et al., 2016). Information about diagnosis and treatment is key, as it may minimize the intensity of the effects of surgery. However, it is necessary to be aware of the patients' and families' knowledge of the treatment and its consequences (da Silva et al., 2014; Sampaio et al., 2008; Zhang et al., 2019).

Responses such as Resiliency Promotion (8340) or "Energy Management (0180)" were also relevant in this study. Patients experience suffering from the very moment they are informed of the need for surgery and a stoma, and nursing professionals should act as educators to support the adaptation of individuals to this new situation (Jefford et al., 2011). It is also important to note the role of interventions relating



 TABLE 2
 NIC interventions code versus sociodemographic and clinical variables

			Age	Sex	Ostomy association	Ostomy in the family	Medical diagnosis	Time (years)	Stoma marking	Period of care
NIC	Y/N	N	p value							
0180	Υ	29	n.s.	n.s.	n.s.	n.s.	n.s.	0.020*	n.s.	n.s.
	N	73								
0430	Υ	3	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	99								
1100	Υ	3	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	99								
1850	Υ	73	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	29								
3590	Υ	66	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	V	<0.001
	N	36								
4470	Υ	7	n.s.	n.s.	0.019	n.s.	n.s.	n.s.	n.s.	0.017
	N	95								
5100	Υ	26	n.s.	n.s.	0.046	n.s.	n.s.	n.s.	n.s.	< 0.001
	N	76								
5220	Υ	50	n.s.	0.030	n.s.	n.s.	n.s.	n.s.	n.s.	0.016
	N	52								
5230	Υ	33	n.s.	n.s.	n.s.	n.s.	n.s.	0.011	n.s.	n.s.
	N	69								
5246	Υ	22	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.010
	N	80								
5248	Υ	23	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	79								
5290	Υ	2	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	100								
5380	Υ	4	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.035
	N	98								
5400	Υ	30	n.s.	n.s.	n.s.	n.s.	n.s.	0.017	n.s.	0.012
	N	72								
5426	Υ	8	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	94								
5820	Υ	21	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	< 0.001
	N	81								
7130	Υ	8	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.001
	N	94								
7140	Υ	2	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	100								
7150	Υ	17	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
	N	85								
8340	Υ	34	n.s.	n.s.	n.s.	n.s.	n.s.	0.009	n.s.	< 0.001
	N	68								

Abbrevations: Y, Yes; N, No: n.s., not significant.

Source: the authors

TABLE 3 NIC intervention vs Period of care: post-operative care versus follow-up care (adjusted by age and sex)

NIC	State of health (p-value)	Odds ratio (OR)	Confidence interval (CI)	Hosmer- Lemeshow (p-value)	Area under the ROC curve
Body Image Enhancement (5220)	0.016	2.92	1.26-7.07	0.830	0.68
Nutritional Counseling (5246)	0.024	0.30	0.10-0.83	0.372	0.73
Enhancing self-esteem (5400)	0.018	0.32	0.12-0.81	0.660	0.70
Anxiety Reduction (5820)	<0.001	0.11	0.02-0.34	0.902	0.75

Variance Inflation Factor (VIF) < 2.5.

Source: the authors.

to the promotion of socialization, Socialization Enhancement (5100) as facilitating elements that place emphasis on interaction with others through mutual aid groups (Carmack et al., 2011; Sampajo et al., 2008; Sayar & Vural, 2019).

Other relevant interventions present were Anxiety Reduction (5820), Self-Esteem Enhancement (5400) (in the surgical period of care), and Body Image Enhancement (5220). Patients with a digestive stoma experience both physical and psychological difficulties (Burch, 2015; Gómez del Río et al., 2013). Patients report feelings of isolation, shame, and depression (Hueso-Montoro et al., 2016; Kenderian et al., 2014). There is also evidence of the impairment of these individuals' self-esteem (Gómez del Río et al., 2013; Lima et al., 2018; Sampaio et al., 2008). During the preoperative period, interventions such as Anxiety Reduction (5820) and Self-Esteem Enhancement (5400) gained relevance, as it is a phase of uncertainty, stress, and distress. This may explain the need to reinforce the knowledge and support of patients in this period due to the changes that take place since the patient is first informed of their cancer.

However, the intervention Body Image Enhancement (5220) is present in the follow-up care phase. It is important to highlight stoma site marking as a preoperative intervention that contributes to improving the patients' adaptation to their new state during follow-up care. In fact, the active participation of patients in this intervention, according to their needs, has been indicated as relevant (da Silva et al., 2014; Gómez del Río et al., 2013).

If both the patient and their partner are involved, there is a greater likelihood that the Sexual Counseling (5248) intervention will appear. It can be difficult for the patient to talk about it, and it may even be a taboo subject for both of them. It is worth remembering that, with active listening and by giving the patient the necessary time to express their emotions, it is possible to build a relationship of trust in order to deal with these problems (Bird, 2019; Gómez del Río et al., 2013; Moreira et al., 2017).

With respect to nutrition, interventions such as Nutritional Counseling (5246) and Nutrition Management (1100) have not appeared in any of the cases in our research. During ostomy surgery of the bowel, a resection of a part of the bowel is performed, leading to electrolyte and nutritional imbalances. It seems reasonable to think that, with these two interventions, in addition to maintaining the hydroelectrolytic balance of patients, patients are provided with all the information necessary to maintain good intestinal functioning and avoid the occurrence

of unwanted flatulence, diarrhea, or constipation (Arenas Villafranca et al., 2014: Lee et al., 2019: Nascimento et al., 2011).

Another important intervention is performed in the absence of support, either from the patients' family or network of friends. It is worth noting that interventions such as Support System Enhancement (5440) or Family Involvement Promotion (7110) were not included in any of the cases. However, this may be due to the existence of a strong family and social structure clearly involved from the beginning of the process (Burch, 2015) meaning that this therefore does not constitute a priority area for nursing practice. On the other hand, it is possible that family support needs are met from the beginning of the process (Wieczorek etal., 2018).

Finally, it has been observed that the period of care (i.e., surgery vs follow-up care) may influence the presence of various other interventions. This is an interesting finding, as it may guide the development of nursing care plans more accurately in clinical practice.

There are some limitations to this study. Given that this is an observational and cross-sectional study, the associations found cannot be verified as reflecting the true causal relationships between the variables. As a result, these associations must be viewed as causal hypotheses that require further comparison studies with a larger sample size. Secondly, this study is based on a list of NIC interventions developed in a previous study (Capilla-Díaz et al., 2019), which means that relevant interventions might have been left out of the study.

This is partly compensated for by the review of the 29 interventions conducted by experts in the field. In addition, in the study itself, the inclusion of interventions for each patient was monitored by a second observer, even though it was not an in-situ assessment, an aspect that we hope to improve in future studies. Ultimately, the aforementioned study is based on a thorough review of the published scientific literature on the expressed needs of ostomy patients.

CONCLUSIONS

The most frequently identified interventions in individuals with a digestive stoma are Decision-Making Support (5250) and Ostomy Care (0480). The predominance of interventions relating to the psychosocial and physical sphere of the person should also be noted. Finally, the period of care in which the patient is at the time, classified as either the post-operative period (period of hospitalization) or follow-up care

(period after discharge), helps to determine which interventions are in place. As a result, Anxiety Reduction (5820), Nutritional Counseling (5246), and Self-Esteem Enhancement (5400) are more likely to be in place during the period of hospitalization, whereas the NIC intervention Body Image Enhancement (5220) stands out during the follow-up care period.

IMPLICATIONS FOR NURSING PRACTICE

By using NIC interventions, provides advanced, evidence-based guidance in helping nursing professionals to develop individual care plans for this population. Self-care is crucial and represents an essential need for patients with stoma both during the post-operative and the follow-up periods of care. Information about diagnosis and treatment is key and it needs to be discussed with both, patients and family.

AUTHOR CONTRIBUTION

Concepción Capilla-Díaz: study supervision, analysis, interpretation of data, writing original draft, review and editing. Noelia Moya-Muñoz: acquisition of data, data entry, analysis, interpretation of data, writing original draft, review and editing. Jose Manuel Matas-Terrón: analysis, interpretation of data, writing original draft, review and editing. María Ángeles Pérez-Morente: interpretation of data, writing review and editing María Adelaida Álvarez-Serrano: interpretation of data, writing review and editing. Rafael Montoya-Juárez: study concept, study design, study supervision, writing review and editing. César Hueso-Montoro: study concept, study design, study supervision, statistical analysis, analysis, interpretation of data, writing original draft, review and editing.

CONFLICTS OF INTEREST

No conflicts of interest have been declared by the authors.

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ORCID

María Adelaida Álvarez-Serrano PhD, RN https://orcid.org/0000-0001-6779-806X

César Hueso-Montoro PhD, RN D https://orcid.org/0000-0003-1515-3870

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