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Students' knowledge on intestinal ostomies before and after an online educational platform intervention

Conhecimento dos estudantes sobre estomias intestinais antes e após intervenção educativa em plataforma online

Conocimiento de los estudiantes acerca de estomas intestinales antes y después de la intervención educativa en plataforma en línea

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ABSTRACT

Objectives: to evaluate undergraduate nursing students' knowledge about intestinal ostomies before and after an educational intervention via an online platform. **Methods:** before and after one-group type quasi-experimental research, carried out with 90 undergraduate nursing students from two higher education institutions in Piauí, from July to October 2014. For knowledge assessment, an instrument validated in Brazil was used. Nonparametric inferential statistics was used to compare the pre-test and post-test averages. **Results:** there was an increase in the average number of correct answers for undergraduate students after intervention in the online educational platform, from 23.67 (SD = 5.9) in the pre-test to 32.01 (SD = 2.72) in the post-test, and this difference was statistically significant (p = 0.000). **Conclusions:** intervention via online educational platform is considered applicable for teaching undergraduate nursing students on intestinal ostomies.
Descriptors: Ostomy; Internet-Based Intervention; Educational Technology; Students; Nursing.

RESUMO

Objetivos: avaliar o conhecimento dos estudantes de graduação em Enfermagem sobre estomias intestinais de eliminação antes e após intervenção educativa em plataforma on-line. **Métodos:** estudo quase-experimental, do tipo grupo único, antes e depois, realizado com 90 estudantes de graduação em Enfermagem de duas instituições de ensino superior do Piauí, no período de julho a outubro de 2014. Para avaliação do conhecimento, empregou-se instrumento validado no Brasil. Estatística inferencial não paramétrica foi utilizada para comparar as médias do pré-teste e pósteste. **Resultados:** houve aumento da média do número de acertos dos estudantes de graduação após intervenção em plataforma educativa on-line, de 23,67 (DP = 5,9) no pré-teste para 32,01 (DP = 2,72) no pós-teste, e essa diferença foi estatisticamente significante (p = 0,000). **Conclusões:** a intervenção em plataforma educativa on-line é considerada aplicável para o ensino de estudantes de graduação em Enfermagem sobre estomias intestinais de eliminação.
Descritores: Estomia; Intervenção Baseada em Internet; Tecnologia Educacional; Estudantes de Enfermagem; Enfermagem.

RESUMEN

Objetivos: evaluar conocimiento de los estudiantes de grado en Enfermería sobre estomas intestinales de eliminación antes y post intervención educativa en plataforma en línea. **Métodos:** estudio casi-experimental, del tipo grupo único, antes y después, realizado con 90 estudiantes de grado en Enfermería de dos instituciones de enseñanza superior de Piauí, de julio a octubre de 2014. Para evaluación del conocimiento, empleó instrumento validado en Brasil. Estadística inferencial no paramétrica fue utilizada para comparar las medianas del pretest y postest. **Resultados:** hubo aumento de la mediana del número de aciertos de los estudiantes de grado post intervención en plataforma educativa en línea, de 23,67 (DP = 5,9) en el pretest para 32,01 (DP = 2,72) en el postest, y esa diferencia fue estadísticamente significante (p = 0,000). **Conclusiones:** la intervención en plataforma educativa en línea es considerada aplicable a enseñanza de estudiantes de grado en Enfermería sobre estomas intestinales de eliminación.
Descriptores: Estomía; Intervención basada en la Internet; Tecnología Educacional; Estudiantes de Enfermería; Enfermería.

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INTRODUCTION

Colon and rectal cancer, one of the first three most common types of cancer in Brazil and second in the world[1], is one of the main etiological factors responsible for the surgical construction of stomata[2]. Intestinal ostomies consist of a surgical intervention that externalizes a portion of the large or small intestine in the abdominal wall for eliminating feces and flatus[3].

The preparation of an intestinal ostomy can be a potentially stressful event, capable of interfering in a person's quality of life[3]. The psychological impact caused by the ostomy demands a comprehensive, multidisciplinary, and specialized assistance intervention, oriented from the perspective of the person and their respective family members, with the purpose of a physical and psychosocial recovery[4].

Nursing knowledge regarding the ostomy is fundamental, as it has the role of caring and guiding for the promotion of autonomy and self-care[5]. There are applications of online educational platform in the field of nursing, either in undergraduate courses[6] or in permanent nursing education[7]. These information and communication technologies (ICTs) can be tools capable of providing theoretical support about intestinal ostomies to nurses and undergraduate nursing students to provide safe and quality care[8].

However, implementing a high-quality online educational platform in public and private educational institutions is a challenge. A study evidenced the need to reinforce the theme of stomatherapy in plans for undergraduate nursing courses, since satisfactory performance towards the person who needs specialized care will require such knowledge from the future professional[9].

In national and international literature, there are resources available on the Internet on ostomies for the education of nurses[7,10] and patients[5,11]. However, there are few studies involving educational strategies complementary to face-to-face teaching on intestinal ostomies with undergraduate nursing students[8,12].

The insertion of technologies in education is inevitable and is a trend in the teaching context[13]. To date, in Brazil, there are no research involving the effect of an online educational platform on the knowledge of undergraduate nursing students about intestinal ostomies, which is why the study was proposed. It is believed that investigations of this nature may contribute to the health and nursing learning process for evidence-based practice, with impacts on learning averages[14].

OBJECTIVES

To evaluate undergraduate nursing students' knowledge about intestinal ostomies before and after an educational intervention via an online platform.

METHODS

Ethical aspects

The research project was approved by the Research Ethics Committee (via Plataforma Brasil), in compliance with the ethical precepts required by Resolution No. 466/2012.

Study design, period, and location

It is a before and after, one-group type, quasi-experimental research, guided by the STROBE tool, carried out from July to October 2014, in two higher education institutions (HEIs), public and private, both located in the state of Piauí, Northeast Region of Brazil.

Population or sample; inclusion and exclusion criteria

The study population consisted of undergraduate students from the 7th, 8th, and 9th periods (n = 381) of the Nursing course at two HEIs. The sample was obtained by convenience and consisted of 197 undergraduate nursing students who met the following inclusion criteria: being regularly enrolled, having studied the Adult and Elderly Health course subject, being available to participate in the study in an extra-curriculum effort. As an exclusion criterion: having been an intestinal ostomies tutor in an online educational platform. As a discontinuity criterion: abandoning the online educational platform on intestinal ostomies at any stage of the pre-test study, after obtaining access to the platform, and during post-test.

Study protocol

In this study, the dependent variable was the knowledge of undergraduate nursing students about intestinal ostomies, and the independent variables were related to sociodemographic aspects (sex, age, marital status, educational background), contact with the ostomized person and access to the computer and internet. For this, three data collection instruments were used. The first contained sociodemographic variables and related to the use of the computer and the internet, adapted from literature[15]. The second had 39 questions with the options "true", "false", and "I don't know", previously validated and that dealt with nursing care in the perioperative of intestinal ostomies[16]. To identify the causes of participant dropout during the study, an adaptation of the third instrument[17], was used, which included probable reasons for dropping out of the course: situational factors, lack of academic support, problems with technology, lack of administrative support and work overload; and undergraduate nursing students could mentioned other factors not covered by the previous options.

The online educational platform was previously built and validated[8] and is hosted on the Modular Object-Oriented Dynamic Learning Environment (Moodle), at the electronic address: http://ead.uninovafapi.edu.br, with a 31-hour completion workload.

The study participants were recruited from a list provided by the Nursing Course Coordination of the two HEIs, and were enrolled in either morning, afternoon, or night classes. After exposing the objectives of the study, undergraduate nursing students were invited to participate; and, in case of acceptance, they were asked to sign the Free and Informed Consent Form (FICF), provide an e-mail address, as well as a telephone for the creation of a group within the WhatsApp application. Sequentially, the webmaster registered the participants on the online educational platform; and login and password were sent by email. Within four weeks, six hours were allocated for three face-to-face

meetings to accompany students in the computer labs of each institution. The meetings were conducted by a graduate nurse and tutors who were undergraduate nursing students belonging to the Grupo de Estudo Pesquisa e Extensão em Estomaterapia e Tecnologia (GEPEETEC) [Research and Extension Study Group in Stomatherapy and Technology], responsible for setting up the online educational platform. During this period, presentation videos with demonstrations on how to use Moodle, a welcome forum, and pre-test were made available. The remaining 25 hours were allocated to activities included in the online educational platform, such as: texts for reading and studying the content, videos, discussion forums, and crossword puzzle exercises created in the hot potatoes software, with weekly release of the modules. After 30 days from the beginning of the intervention, the participants were reunited at the institution, according to their availability, for post-test application.

Analysis of results and statistics

The data were entered and validated twice in Microsoft Excel. Statistical analysis was performed using the SPSS program, version 18.0. Descriptive statistics were used for the sociodemographic variables, use of the computer and internet, and for dropping out of the online educational platform. Frequency (absolute and relative) was used for qualitative variables; and for quantitative, dispersion measures (mean and standard deviation - SD). Nonparametric inferential statistics was adopted to compare the pre-test and post-test averages. The Wilcoxon test (paired samples) was performed at a significance level of 0.05.

RESULTS

Out of 197 undergraduate nursing students, 90 effectively participated in the study (Figure 1). The dropout rate was 54.31%; due to lack of time (40.4%), followed by work overload (23.1%), and internet instability (20.2%).

The sample was predominantly characterized by female nursing students 77 (85.6%), single 70 (77.8%), and with an average age of 26.63 years (SD = 7.34). As for education, 44 (50%) came from public institutions; seventy-six (84.4%) were from private HEIs; and 22 (24.4%) were in the 7th period; 50 (55.6%), 8th period; and 18 (20%), 9th period.

Forty-four (50%) participants had come in contact with an ostomized person at some point during the undergraduate course; of these, 16 (44.4%) stated that the first contact occurred as of the 7th period. Eighty-seven (96.7%) had a computer: for daily use, 72 (80%); and at home, 79 (88.8%). Only 1 (1.1%) graduate student in Nursing did not have access to the internet; and 74 (82.2%) accessed it daily; and at home, 81 (92%).

With regard to the knowledge of undergraduate nursing students related to the domains "Concept", "Indication", and "Classification" of intestinal ostomies, only one item related to the definition of colostomy showed a decrease in the number of correct answers in the post-test - 42 (47.2%). The definition of ileostomy, despite the increase in correct answers after educational intervention, did not reach 80% in the post-test (Table 1).

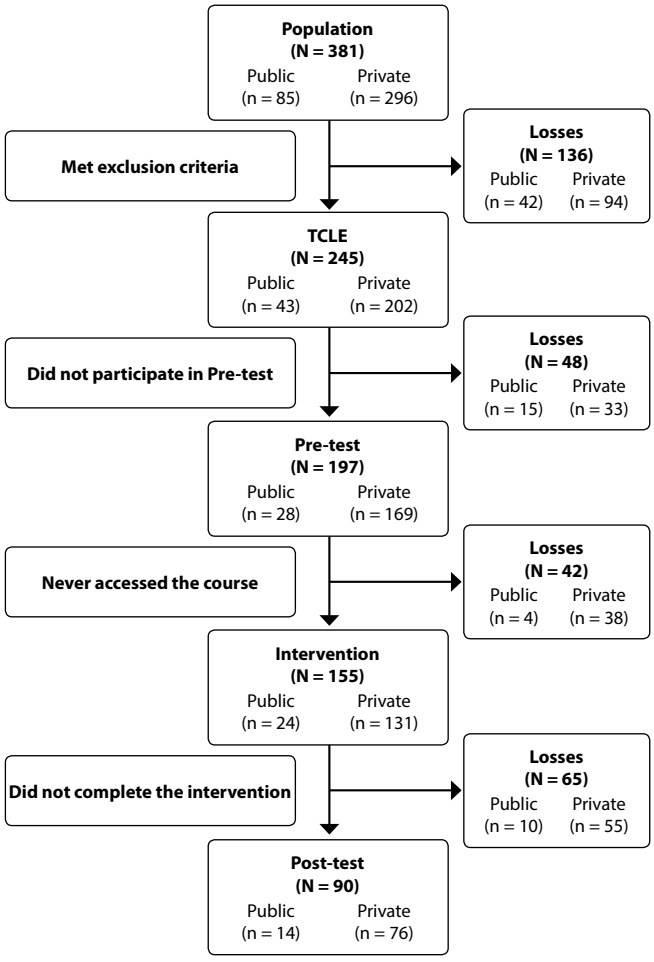

Figure 1 – Study sample, Teresina, Piauí, Brazil, 2015

Most items related to the domain "Nursing care in preoperative intestinal ostomies" had a percentage above 90% after educational intervention, except for the item related to the demarcation of the stoma, which had a reduction in correct answers in the post-test - 58 (65.2%) (Table 2).

Regarding the domain "Nursing care in the immediate postoperative period", there was an increase in the number of correct answers on all items after the online educational platform intervention. Despite the increase, aspects related to the color and shape of the stoma, outflow of flatus, abnormal amount of effluent in the ileostomy, characteristics of the peristomal skin, protrusion of the colostomy and ileostomy did not reach 80% (Table 3).

Table 1 - Percentage of correct answers, according to the "concept", "indication", and "classification" domains, in the pre-test and post-test, (n = 90)

Questions	Correct Answers			
	Pre-test		Post-test	
	n	%	n	%
Concept				
Intestinal stomas	80	89.9	88	97.8
Colostomy	46	52.3	42	47.2
Ileostomy	39	43.8	47	54.7
Indication				
Most frequent causes for surgical confection	78	86.7	87	97.8
Classification				
Temporary and definitive	73	81.1	88	97.8

In the domain "Nursing care in the immediate and late postoperative period", all items had an increase in the percentage of correct answers. However, the item "colostomy irrigation" did not reach 80% of correct answers in the post-test (Table 4).

In the pre-test and post-test, the averages of the number of correct answers were 23.67 (SD = 5.9) and 32.01 (SD = 2.72), respectively, and this difference was statistically significant (p = 0.000).

Table 2 - Percentage of correct answers, according to the domain "Nursing care in the preoperative period", in the pre-test and post-test, (n = 90)

Questions	Correct Answers			
	Pre-test		Post-test	
	n	%	n	%
Nursing care in the preoperative period				
Preoperative consultation	73	81.1	88	97.8
Stoma confection	84	94.4	88	97.8
Stoma characteristic	79	87.8	83	92.2
Collecting equipment and adjuvants	53	63.9	89	98.9
Impact on sexuality	87	96.7	89	98.9
Stoma demarcation	81	90.0	58	65.2
Stoma positioning	31	35.6	78	88.6
Demarcation and complications	24	26.7	82	93.2
Stoma location	40	44.9	80	88.9
Sensitivity test	65	74.7	83	93.3

Table 3 - Percentage of correct answers, according to the domain "Nursing care in the immediate postoperative period", in the pre-test and post-test, (n = 90)

Questions	Correct Answers			
	Pre-test		Post-test	
	n	%	n	%
Nursing care in the immediate postoperative period				
Fitting of the ostomy collecting equipment	76	84.4	83	93.3
Collecting equipment characteristics	85	94.4	89	98.9
Stoma swelling	61	67.8	85	95.5
Stoma color	21	23.3	28	31.8
Stoma shape	47	52.2	73	83.0
Flatus output	35	38.9	71	79.8
First eliminations	31	34.4	76	86.4
Aspect of the ileostomy and colostomy effluent	44	48.9	73	81.1
Abnormal amount of effluent in ileostomy	24	27.0	47	52.8
Peristomal skin	31	34.4	56	62.2
Colostomy protrusion	25	27.8	56	62.9
Ileostomy protrusion	8	9.0	41	45.6
Early complications	64	71.1	77	85.6
Stoma diameter	48	53.3	72	81.8
Adhesive base	67	74.4	83	92.2
Collecting equipment options	66	75	79	87.8

Table 4 - Percentage of correct answers, according to the domain "Nursing care in the immediate and late postoperative period", in the pre-test and post-test, (n = 90)

Questions	Correct Answers			
	Pre-test		Post-test	
	n	%	n	%
Nursing care in the immediate postoperative period				
Effluent characteristic in descending and sigmoid colostomy	40	44.4	73	81.1
Hospital discharge	81	90.0	88	97.8
Customer referral	49	57.0	74	83.1
Nursing care in the late postoperative period				
Public policy	79	87.8	89	98.9
Ostomy patient's association	76	84.4	88	97.8
Colostomy irrigation	32	35.6	56	62.2
Late complications	42	46.7	84	93.3

DISCUSSION

In this study, undergraduate nursing students obtained an increase in the average of correct answers in the post-test, which reflects the positive effect of learning through the online educational platform. Satisfactory results were also found in previous studies that used technological resources in an undergraduate nursing course[14,18]. Most students had a computer and Internet access, reflecting the national scenario[19], which suggests a digital generation for which the insertion of ICTs alongside face-to-face teaching can have a positive effect on the online learning process.

The importance of using online educational platforms in the teaching-learning process was very evident with the pandemic of 2020, since social distancing recommended by governmental guidelines made many undergraduate nursing courses adhere to technologies. However, it is necessary to apply evidence-based tools capable of promoting student engagement with learning and completing online educational programs[20].

In this sense, the percentage of dropouts observed among undergraduate nursing students participating in the online educational platform intervention on intestinal ostomy reinforces the need to implement strategies that enable adherence to ICTs in courses complementary to classroom teaching. In this sense, results have already been shown in a study at the University of Canada which pointed out benefits of using an interactive tool for online engagement of Nursing students in a course on leadership[20].

The evaluation of undergraduate nursing students on perioperative care for surgeries that generate intestinal ostomy showed knowledge gaps before the intervention; also, it was evidenced that the online educational platform contributed to students' learning about ostomy. The theme is rarely addressed in undergraduate studies and is almost always linked to the training of stomatherapy nursing specialists[21]. In this way, an internet mediated resource could enable the acquisition of knowledge and contribute to instrumentalize clinical practice.

Among the evaluated items, there was a decrease in the number of correct answers in the post-test "Concept", "Indication", and "Classification" domains only for the item "definition of colostomy"; and, for the "definition of ileostomy", the increase in correct answers after an educational intervention did not reach 80%. Understanding the types of intestinal ostomy requires basic knowledge of anatomy by the nurse and constitutes indispensable information to be passed

on to the ostomy patient. A previous study showed that more than 80% of nurses demonstrated adequate knowledge regarding the concepts of colostomy and ileostomy, and this may be linked to the experience gained from professional practice[7].

In this research, the limited contact nursing students had with ostomized people indicates less experiences with care; and, according to previous research[22], this can contribute to the lack of knowledge and lack of confidence in the ability to provide care. Knowledge about the theme is essential for students to assess, provide guidance to patients and family members, and to develop self-care strategies[22].

In the domain "Nursing care in the preoperative period of intestinal ostomies", there was a decrease in the number of correct answers in the post-test related to the item "stoma demarcation". This finding corroborates previous studies[7,10] and indicates the need to reinforce the knowledge of undergraduate nursing students about demarcation of the stoma through appropriate educational strategies for this purpose. The programmed demarcation of the stoma substantially reduces the incidence of postoperative complications, so spaces should be created in training and assistance that encourage the teaching of the procedure, combined with practice; still, it is necessary to guarantee its realization in the nurse's workspace, during the preoperative nursing consultation[23].

Regarding the domain "Nursing care in the immediate postoperative period", despite the increase in correct answers on all items in the post-test, aspects related to characteristics of the stoma, peristomal skin, and effluents kept percentages below 80%. The guidelines[24] for the care of intestinal ostomies in the immediate postoperative period include recommendations regarding characteristics, control of effluent and volume, and aim to identify risk factors that influence any complications. Although the guidelines recommend the evaluation of the stoma and peristomal skin in the immediate postoperative period, the present study demonstrated that these undergraduate nursing students have knowledge deficiency in relation to the aforementioned aspects. This should be understood as a warning sign since the limitation of knowledge at graduation and in clinical practice compromises assistance and guidelines for self-care and can lead to complications for the ostomized person[21].

As for the domains "Nursing care in the immediate and late postoperative period of intestinal elimination ostomies", there was an increase in the knowledge of undergraduate nursing students in all items after the online educational platform intervention. Only the item "colostomy irrigation", even with the increase in correct answers in the post-test, obtained a percentage lower than 80%, corroborating other studies[7,10].

The guidelines for the care of intestinal elimination stomas in the postoperative period published by RNAO[24] include irrigation of the descending and sigmoid colostomy as a safe and effective method. However, education for intestinal irrigation is still poorly disseminated, which may be related to the lack of knowledge on the part of health professionals[7]. In this study, the knowledge gap of undergraduate nursing students on colostomy irrigation reinforces the need to stimulate, discuss, and expand the theme to favor the understanding and acquisition of learning.

There was a statistically significant difference in the knowledge of undergraduate nursing students about intestinal ostomies before and after the online educational platform intervention ($p = 0.000$). According to the results of this study, the use of educational strategies that include ICTs in face-to-face teaching is highly effective in the teaching-learning process. The use of these technologies favors the use of pedagogical strategies that facilitate the teaching-learning process, as well as providing the student with a dynamic learning by granting him flexibility in time and place[25]. Thus, associated with face-to-face teaching, ICTs are strategies that improve academic performance, enabling new ways of learning[26-28].

Study limitations

The limitations for carrying out this study were: the sample size, which prevented a generalization of the results; the loss of undergraduate nursing students at the beginning and throughout the intervention, which can be explained by the overload of curricular and extracurricular activities, as well as the reduced number of tutors to monitor and encourage participation; the difficulty in using the online educational platform by some students, despite receiving both printed tutorials that were also available on Moodle as well as face-to-face instructions or via personal e-mail, WhatsApp, phone calls, and phone messages; a single assessment of knowledge, right after the end of the educational intervention, whereas the ideal would be to make further observations.

Contributions to the field

Undergraduate nursing students' lack of knowledge pertaining care for ostomized people prior to the intervention portrays the gaps in the training of nurses. It should be considered that the knowledge received in the undergraduate course enables the development of actions, as well as training future professionals involved in the specialized and systematized assistance of stomatherapy.

In this way, this study can support the inclusion and support of educational technologies in undergraduate courses, as their implementation can improve learning outcomes. In addition, it is pertinent to encourage: the development of future educational offerings in order to ensure that the educational content and format are adequate to meet the needs of students; redesigning the current program to emphasize key learning points and/or other active learning strategies.

CONCLUSIONS

There was a positive effect on the knowledge of undergraduate nursing students about intestinal ostomies, after the online educational platform intervention, which makes it applicable to teaching. Web-based educational resources that involve collaborative learning can complement face-to-face teaching and favor the teaching-learning process.

In this study, some items did not stand out in the number of correct answers after intervention in an online educational platform, so it is believed that the assimilation of content can be

greater when combined with practice and when the subject is constantly taken up for greater fixation and learning effectiveness.

In general, ICTs are tools that, if used properly, stimulate students' interest to actively participate in the learning process, promote collaborative learning, and enable them to build their knowledge and develop their skills.

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