

## Effect of Providing Ostomy Care Education to Mothers of Neonates with Peristomal Skin Complications

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### Abstract

**Introduction:** Ostomy is a surgical procedure performed to divert feces and urine output in cases of anorectal anomalies. Although this procedure is a crucial intervention with excellent treatment effect, it is associated with complications, such as peristomal skin lesions. This study aimed at evaluating the effect of providing ostomy care education to mothers of infants with peristomal skin complications.

**Methods:** Forty mothers of neonates with intestinal stomies were informed about the aim of this study and invited to participate. The sampling was conducted in accordance with the quota sampling method. The participants were randomly and equally allocated to the control and experimental groups. The mothers in the experimental group attended a three-session educational program, whereas the mothers in the control group received information about routine care methods used by the study settings. The peristomal skin conditions of the infants in both groups were examined before discharge and 30 days after discharge using the Telegram Software or in person, according to an established checklist. Data were analyzed with the SPSS 21 software to obtain descriptive and analytical statistics.

**Results:** Prior to discharge, the majority of the neonates in both groups had healthy peristomal skin. In the control group, five neonates had acute dermatitis and one had chronic dermatitis. In the experimental group, four neonates had acute dermatitis and two had chronic dermatitis. The  $\chi$ -square test showed that the two groups were not significantly different ( $p$ -value = 0.94). After discharge, most of the neonates in the experimental group had intact peristomal skin and only four neonates had chronic dermatitis. In contrast, in the control group, only six neonates had intact peristomal skin. The results of Fisher's exact test indicated that the two groups of study were significantly different ( $p$ -value = 0.013). In the experimental group, 16 and 14 neonates had intact peristomal skin before and after discharge, respectively. In the control group, 14 and 6 neonates had intact peristomal skin before and after discharge, respectively. The results of McNemar's test revealed no significant differences in the experimental group before and after discharge ( $p$ -value = 0.69), whereas the control group showed significant difference in this context ( $p$ -value = 0.021).

**Conclusions:** Providing mothers with education on proper ostomy care significantly decreased the occurrence of peristomal skin lesions in neonates with intestinal stomies.

## INTRODUCTION

Parents eagerly wait for the time to take their newborns home. However, approximately 9% of newborn infants with anomalies, such as cardiopulmonary and metabolic disorders, and anorectal anomalies, have to be admitted to Neonatal Intensive Unit (NICU), thus placing their parents under stress [1]. Anorectal anomalies are some of the most prevalent congenital anomalies [2] that require surgical intervention. These anomalies are usually identified within the first days of infancy [3]. Ostomy is a surgical procedure that is performed to deviate feces or urine output in case of anorectal anomalies [4]. The main purpose of ostomy management is to prevent the occurrence of complications, such as bleeding, ischemia, necrosis, intestinal protrusion, tightness, peristomal hernia, intestinal obstruction, ulceration, bleeding, and peristomal skin fragmentation, wear and abrasion. Some of these skin complications consist of protrusions, distress, fossa, and ulceration as well as ostomy wounds. Alkatravi et al.'s (2013) study on 105 infants (6–72 months) with ostomy revealed that peristomal skin complications ranged from average to severe in 15 patients (14%) [5]. A descriptive study by Somer et al. (2010) that included 37 infants (1 day to 4 years old), who had undergone colostomy surgery during years 2008 and 2009, indicated that skin lesions are the most common complications after colostomy surgery (58.82%) [6]. The reasons for these complications include the inappropriate selection of the ostomy area, surgical techniques, comorbidities, abnormal connection systems, and lack of knowledge and expertise regarding ostomy care by caregivers [7]. All individuals with ostomies are at risk of peristomal skin complications. However, the occurrence of peristomal skin complications can be decreased through appropriate measures [8]. Proper peristomal skin care directly affects the infant's mortality [9]. Feces can cause skin irritation and create burn-like areas on peristomal skin that requires special attention [10]. Parents, who are the major caregivers of high-risk infants with chronic conditions [11], should receive emotional and training support to alleviate the stress associated with the infants' illnesses and to enable them to perform caregiving activities at home [5]. Peristomal skin care is very important to prevent the rapid progression of skin irritation. Given that infants, who are readmitted for occluded intestinal ostomies often present peristomal skin lesions, this study evaluated the effect of educating mothers of infants with peristomal skin complications about proper ostomy care. This study was conducted at selected hospitals affiliated to the medical universities in Tehran.

## METHODS

The current clinical trial involved three selected hospitals (Mofid, Ali Asghar, and Bahrami) affiliated to medical universities. The convenience sampling method was utilized. Mothers with infants, who required intestinal ostomy without other structural abnormalities and were fluent in the Persian language were recruited as participants. Participants provided written and oral consents. Participants were excluded if the infant died during the study; the duration of ostomy use lasted for less than one month after discharge or longer if the infant was readmitted for non-ostomy-related reasons. The mothers were randomly assigned to the control or inter-

vention groups. Each group comprised of at least 20 mothers whose infants had anorectal anomalies that required intervention through intestinal ostomy. A researcher explained the aim of this study to the participants. The number of samples was calculated in accordance with the following formula. Material: Demographic data were collected using a researcher-designed questionnaire. The questionnaire consisted of 19 questions in two parts. The first part consisted of 13 questions about the mother's demographic information, including age, education, occupation, income, number of children, medical history (depression, cardiovascular diseases, or diabetes). The second part consisted of six questions about the infant's demographic information, including gestational age, gender, weight at the time of surgery, type of ostomy, nutrition, and age at the time of discharge. A skin examination checklist was designed on the basis of a literature review and with the help of four pediatricians and pediatric surgeons and two university professors. The checklist included the following items: intact skin, acute dermatitis, chronic dermatitis, chemical dermatitis, fungal rash, infection, and mechanical damage signs. Validity was confirmed through the content validity method. The questionnaire was sent to 10 experts and the professors of the School of Nursing and Midwifery, Shahid Beheshti. The checklist was modified in accordance with the respondents' comments and suggestions. The examination checklist had six sections, and its reliability was confirmed through the inter-rater method. For this purpose, the examination list was submitted to a second observer. Two observers completed the examination list for 15 infants at the same time. The obtained Kappa coefficient had a value of 1. Mothers of neonates, who were undergoing intestinal ostomy at the participating hospitals, had started nutrition, and met the eligibility criteria were invited to participate in the study. During the first session, the designed questionnaire was distributed to collect demographic information. The participants' phone numbers were recorded for future visits or for peristomal skin examination. The intervention group attended three organized training sessions. The control group received information about routine care procedures in the study settings. Mothers in the experimental group were trained in three 15- to 20-minute sessions. The lectures included images and videos that provided brief explanations about the anatomy of the digestive system, reasons for ostomy, potential complications following ostomy, information about skin complications, the proper care of peristomal skin, and the correct use of ostomy bags. The sessions provided practical and theoretical information on the individual and face to face basis in the ward. The phone number of the researcher was given to the mother in case she had any questions. Training before infant's discharge lasted for a week. Before discharge and one month after discharge, the state of the peristomal skin of the infants in both groups was assessed via the Telegram software or personal observation in the clinic by the researcher, in accordance with the established checklist. Mothers, who were in the intervention group could call the researcher whenever they needed during the experimental period. Given the unequal numbers of samples in one unit and conditions of infants and mothers, there was no possibility of contact between the control and intervention groups. The SPSS 21 software was used to analyze the data. Descriptive statistical parameters including

frequency distribution, mean, and standard deviation were used to describe the characteristics of the subjects. The variables in the experimental and control groups were compared using the Kolmogorov Smirnov normality test. A confidence level of 95% and p-value of lower than 0.05 were considered significant. Data frequency in the control and experimental groups was compared through the  $\chi$ -square test.

**RESULTS**

The experimental and control groups included 20 participants each, all of whom were mothers of infants with anorectal anomalies that required an intervention through intestinal ostomies. Originally, 48 mothers were invited to participate in the study. However, information from only 40 infants (30 males and 10 females) was included. The rest of the information was excluded because the infant died prior to discharge or there was a lack of follow up after discharge. The mean age of the participants in the experimental and control groups was 31.21 and 29.83 years old, respectively. The results of *t*-test did not show any significant difference between the two groups in terms of age ( $P = 0.45$ ). The Mann–Whitney test revealed no significant difference between the two study groups in terms of the mothers’ educational background ( $P = 0.98$ ). At the time of surgery, the average weight of the infants in the control (94.4%) and experimental (94.7%) groups exceeded 2 kg. Nutrition after discharge consisted of breastfeeding (66.7%) and milk powder (5.6%) in the control group and breastfeeding (47.4%) and milk powder (21.1%) in the experimental group. In the control and experimental groups, 77.8% and 78.9%, respectively, did not use ostomy bags after discharge. In the control and experimental groups, 100% and 94.7% of the participants, respectively, had not received any previous training. In general, no significant difference existed between the two groups. The breakdown of peristomal skin condition

before discharge in the control group was as follows: healthy (70%), chronic dermatitis (5%), and acute dermatitis (25%). The breakdown of peristomal skin condition in the experimental group was as follows: healthy (70%), chronic dermatitis (10%), and acute dermatitis (20%). According to Table 1, the majority of infants in both groups had a healthy peristomal skin prior to discharge. In the control group, five infants had acute dermatitis and one had chronic dermatitis. In the experimental group, four infants had acute dermatitis and two had chronic dermatitis. The results of  $\chi$ -square test showed no significant difference between the two groups ( $P$ -value = 0.94). As shown in Table 2, after discharge, 30% and 10% of the infants in the control group had healthy skin or fungal rashes, respectively. In contrast, 80% and 20% of the infants in the experimental group had healthy skin and acute dermatitis, respectively. Most of the infants in the experimental group had healthy skin and only four had acute dermatitis. However, in the control group, only six infants had a healthy skin. The results of Fisher’s exact test showed significant differences between the two groups ( $P$ -value = 0.013). As shown in Table 3, in the experimental group, 14 and 16 infants had healthy skin before and after discharge, respectively. In contrast, in the control group, 14 and 6 infants had healthy skin before and after discharge, respectively. The results of McNemar’s test showed that no significant difference was observed in the experimental group both before and after discharge ( $P$ -value = 0.69), whereas the control group exhibited a significant difference before and after discharge ( $P$ -value = 0.021).

Before discharge, most of subjects in both groups had healthy skin prior to discharge. In the control group, five subjects had acute dermatitis and one subject had chronic dermatitis. In the experimental group, four subjects had acute dermatitis and two had chronic dermatitis. The results of the  $\chi$ -square test ( $P$ -value = 0.94) showed no significant difference between the two groups.

**Table 1:** Descriptive/Inferential Statistics of the Skin Condition of the Subjects in the Research Groups before Discharge

Group	Intervention		Control	
	Number	Percentage	Number	Percentage
Healthy	14	70	14	70
Acute dermatitis	4	20	5	25
Chronic dermatitis	2	10	1	5
Total	20	100	20	100
Statistical significance test	$\chi$ -square, P-value = 0.94			

**Table 2:** Descriptive/Inferential Statistics of the Skin Condition of the Subjects in the Research Groups after Discharge

Group	Intervention		Control	
	Number	Percentage	Number	Percentage
Healthy	16	80	6	30
Acute dermatitis	4	20	4	20
Chronic dermatitis	0	0	5	25
Chemical dermatitis	0	0	3	15
Fungal rash	0	0	2	10
Total	20	100	20	100
Statistical significance test	Fisher’s exact test, P-value = 0.013			

The majority of the subjects in the experimental group had healthy skin and only four subjects had acute dermatitis. In contrast, only six subjects had healthy skin in the control group. The results of Fisher's exact test showed a significant difference between the two groups of study.

The number of infants with healthy skin before and after discharge was 14 and 16 in the experimental group, respectively, and 14 and 14 in the control group, respectively. The results of McNemar's test showed that no significant difference was observed in the experimental group before and after discharge ( $P = 0.69$ ), whereas a significant difference existed in the control group before and after discharge ( $P = 0.021$ ).

**DISCUSSION**

Ostomy is performed on infants to manage anorectal anomalies. The findings of this study are consistent with those of a previous studies, which reported that 70% (14 out of 20 infants) did not show peristomal skin complications at 30 days after surgery. The purpose of this study was to foster a continuous and dynamic relationship between healthcare professionals and the caretakers of infants with ostomies, thus improving the patient's life quality, decreasing the occurrence of complications, and increasing satisfaction, health, and healthcare quality. A continuous and effective caregiving relationship is defined as a balanced and dynamic relationship between healthcare professionals, the patient, and the patient's family; the quality and content, method, and nature of healthcare services are thus important to the patient's health [12]. According to the main goal of the study, the effect of infant's ostomy care training sessions for mothers on skin complications resulted from intestinal stoma in selected hospitals of Tehran was investigated. The results of the study showed that 80% of the subjects in the intervention group had healthy skin, whereas only 30% of the subjects in the control group had healthy skin. A significant difference was

found between the two groups. The findings of this study are consistent with those presented by Cho and Dong (2015), who described and investigated the value of a training plan regarding a child's health and parent's concerns. Their results showed that concerns about the infant and his future are common among mothers, who were all concerned about economic issues. Training could improve the infant's health. Mothers in the experimental group were eager to learn about the proper care of their children; as a result, they had healthier children, who required fewer emergency visits than the children of mothers in the control group, thus decreasing the total expenses of the family and the healthcare system [13]. This study investigated the skin conditions of infants with intestinal ostomies after discharge. In this study, the degree of the skin complications of the infants in the control and experimental groups ranged from average to severe. Results showed that 30% of infants from each group were discharged with different degrees of skin complications; these complications may be related to the lack of knowledge and expertise regarding healthcare activities at the hospital. Ilhan and Torner (2015) utilized descriptive and observational methods to evaluate the knowledge and expertise of the Neonatal Intensive Care Unit (NICU) nurses at Zekai Tahir Burak Hospital. Of the 165 NICU nurses, 120 were recruited for the study. The average scores of knowledge level and expertise of the nurses were  $59.90 \pm 16.1$  out of 100 and  $53.4 \pm 11.7$  out of 84, respectively [7]. The results of this study showed that the level of nursing knowledge about ostomy care was weak. One of the findings of this study on 40 infants showed that of the participating infants in the present study, 70% and 30% were male and female, respectively. This result is consistent with that reported by Davari et al. (2010); 55% and 45% of 93 subjects were male and female, respectively [14]. However, given that this study was conducted at a healthcare center and the present study was conducted at selected hospitals in Tehran, the results cannot be generalized.

**Table 3:** Frequency Distribution of Peristomal skin Complications in the Research Groups before and after Discharge

After discharge	Before discharge							
	Control group				Intervention group			
	Healthy	Acute dermatitis	Chronic dermatitis	Total	Healthy	Acute dermatitis	Chronic dermatitis	Total
Healthy	5	0	1	6	12	3	1	16
Percentage	25	0	5	30	60	15	5	80
Acute dermatitis	4	0	0	4	2	1	1	4
Percentage	20	0	0	20	10	5	5	20
Chronic dermatitis	3	2	0	5	0	0	0	0
Percentage	15	10	0	25	0	0	0	0
Chemical dermatitis	1	2	0	2	0	0	0	0
Percentage	5	10	0	10	0	0	0	0
Fungal rash	1	1	0	2	0	0	0	0
percentage	5	5	0	10	0	0	0	0
Total	14	5	1	20	14	4	2	20
Percentage	70	25	5	100	70	20	10	100

The limitations of this study consisted of time, sample collection, and lack of cooperation of mothers regarding images and software knowledge. This study obtained results that will help hospital managers and the nursing community to facilitate nursing goals and activities. Moreover, no consensus exists about the advantages of the use of an ostomy bag in infants, and some centers do not suggest the use of ostomy bags, given their high costs. Thus, further studies are needed to compare skin complications while using ostomy bags.

### ETHICAL CONSIDERATION

Issues, Informed consent, conflict of interest, plagiarism, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been considered carefully by the authors.

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### CONFLICTS OF INTEREST

There is no conflict of interest to be declared

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### AUTHOR CONTRIBUTION

All authors participated in the study design, literature review, data collection, analysis, and editing of the manuscript.

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