

Effect of Skin Intervention Protocol on Incontinence-Associated Dermatitis among Patients with Fecal Incontinent

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Abstract: Incontinence-associated Dermatitis (IAD) is a serious and common problem that must be addressed in acute care settings.

Aim: to examine the effect of skin intervention protocol on incontinence-associated dermatitis among patients with fecal incontinent.

Methods: Quazi- experimental design was utilized. A convenience sample of 60 adults patients. Patients were divided randomly and equally into two groups (30 patients each) control group, received the routine hospital skin care and the study group, received the skin intervention protocol. Twenty patients were dropped from the study from both groups. The final sample was 40 patients (20 patients for each group). The study was conducted in medical and surgical departments at one of the Ministry of Health Hospitals at Center region in Saudi Arabia. Four tools were used to collect data, a demographic and clinical characteristics data sheet, The Perineal Assessment Tool (PAT), The Incontinence-Associated Dermatitis and Its Severity Instrument (IADS) and Skin intervention protocol.

Results: The study results showed that there was statistical significant difference between study and control groups post intervention among high risk participants. In the study group, there was a significant reduction of the IAD incidence by the fourth day. Additionally, there was a statistical significant difference between study and control group for IAD participants from the Fifth day to the Seventh day. In the study group, there was improvement in the management by the end of day Seven.

Conclusion: The skin intervention protocol was effective in prevention and treatment of IAD among high risk and IAD patients of the study group.

Recommendation: Replication of the study with larger sample size to determine the safety and effectiveness of commonly used products and procedures.

Keywords: Fecal incontinent, Incontinence-associated Dermatitis, Acute care settings, Perineal skin care

I. Introduction

The effect of incontinence on the skin is recognized to be a major cause of skin damage known as moisture lesions [1]. Incontinence-associated dermatitis (IAD) is one form of these moisture lesions [2]. It is distinguished as erythema of the skin in the genital, buttock or upper leg areas when exposed to urine and or stool, it is often accompanied by erosion of the skin and cutaneous candidacies [3]. IAD has a prevalence rate range from 5.6% to 50% and the incidence rates range from 3.4% to 25%, depending on the type of setting and population [4].

IAD is a common problem in patients with urinary, fecal or dual incontinence and can distress any age group [5]. The incidence of fecal incontinence among patients in acute/critical care settings range from 18% to 37%. [6]. It has been reported that fecal incontinence is more strongly associated with IAD than urinary incontinence [7]. In elderly residents in nursing homes, all of the patients who developed IAD also had fecal incontinence [8].

Fecal incontinence has a devastating effect on patient's skin, quality of life and dignity [9]. IAD can be painful, hard to properly identify, complicated to treat, and costly. IAD resulting from prolonged contact with normal stool, that is alkaline with a distinctive pH of 7.0-7.5, and perspiration which commonly occurs when diapers are worn [10]. Additionally, the increase of pH of the skin leads to colonization of microorganisms from stool that can be broken the skin permeability resulting in irritation or infection. Furthermore, the skin is susceptible to physical damage by pressure, shear or friction resulting from a patient's bedbound status, repositioning, diaper use and cleansing [11-12]. There are factors that raise the risk of IAD including continued contact with moisture, obstruction of the skin through persistent wearing of damp diapers and increasing age [13-14].

There is evidence that prevention and treatment of IAD is the best treatment. Preventive regimens for individuals at risk for IAD should include inspection, gentle cleansing, moisturizers and skin protectants [3, 15-20]. Although, IAD is a prevalent nursing problem, 33% of patients in acute care settings have fecal

incontinence with a third of these patients developed IAD [11]. Notably, IAD has received little attention as a distinct skin disorder and sometimes confused with superficial pressure ulcer and research focused on incontinence products and protocols often takes place in long term-care facilities with comparatively limited research studies done in the acute care settings. Where the level of patient acuteness is more and the effect of IAD may be challenging [4, 21]. Although, many skin intervention protocols, cleansers, moisturizers, moisture barriers, skin protectants and absorbents existing to provide prevention and management little is known about their practicality and effectiveness in acute care setting. Additionally, skin breakdown is diagnosed as a key indicator for quality of care [22]. IAD is a form of skin breakdown and its prevention and management is considered nurse-sensitive indicator. Thus, the purpose of the current study is to examine the effect of skin intervention protocol on IAD among Patients with Fecal Incontinent.

1.1 Aim of the study

The aim of this study was to examine the effect of a skin intervention protocol on incontinence-associated dermatitis among patients with fecal incontinent.

II. Methods

2.1 Framework of the Study

The Donabedian model is a conceptual model that provides a framework for examining quality of health care for decades [23]. According to the model, information about quality of care can be drawn from three categories: “structure,” “process,” and “outcomes. It was used as the guiding framework for the current study. The Donabedian’s 1966 framework is linear and assumes that the structure such as unit type, staff, or available product affects processes such as skin intervention protocol and thus influences positive or negative outcomes such as skin breakdown in the presence of incontinence.

1.2 Design

Quasi-experimental research design was utilized in the current study.

1.3 Setting

The study was carried out in medical and surgical departments at one of the Ministry of Health Hospitals at Center region (Kingdom of Saudi Arabia).

1.4 Sample

Convenient samples of 60 adult patients admitted to the previously mentioned setting were recruited. Calculation of the sample size was based on the previous studies that examined the effect of skin care protocol to prevent IAD and used similar sample size [24-28]. Patients who met the study inclusion criteria which include those who were at risk and/or affected by IAD, newly admitted or within 48 hours after admission, had indwelling urinary catheterization, using stool collective pad and age 18 years or older. Patients were excluded from the study if they have any of these conditions: open sore on perineal skin caused by pressure / shear, diagnosed skin disease of the perineum and known allergy influencing skin integrity. Patients were divided randomly and equally into two groups (30 patients each) control group, received the routine hospital skin care and the study group, received the skin intervention protocol. Twenty patients were dropped from the study from both groups. Five patients died and the rest of the participants were transferred to another hospital in different region. The final sample was 40 patients (20 patients for each group).

2.5 Tools of Data Collection

- 1- **A demographic and clinical characteristics questionnaire:** which includes demographic data such as age, gender and medical data such as present diagnosis and past medical history.
- 2- **The Perineal Assessment Tool (PAT):** developed by Nix, (2002) [29] to assess risk for IAD. It is a numerical rating tool which consisted of a 4-item based conceptually on the 4 determinants in perineal skin breakdown: type and intensity of irritant, duration of contact with irritant, perineal skin condition, and contributing factors e.g. low albumin, antibiotics, and tube feeding. Each item is rated with a score ranging from 1 to 3.

The total scores of the PAT ranging from 4 (least at risk) to 12 (most at risk). Cumulative scoring indicate that, the higher the score the higher the risk of IAD. Inter-rater reliability reported was 87 %.

- 3- **The Incontinence-Associated Dermatitis and Its Severity Instrument (IADS):** developed by Borchert, Bliss, Savik & Radosevich (2010) [30] to evaluate incontinence-associated dermatitis and its severity. The IADS is a descriptive tool that ranks the severity of IAD. The tool contains the 4 constructs of location, redness, skin loss, and rash. The location of IAD is identified based on 13 locations including the perianal skin, buttocks, genitalia, upper thigh, and skin folds between genitalia

and thigh. The magnitude of erythema is based on a 3-point ordinal scale that varies from none (0) to pink (1) to red (2); the tool includes 2 pallets designed to aid the clinician in evaluating persons with lighter and darker skin tones. Rash is scored as present (3) or absent and Skin loss are scored as present (4) or absent. The worse type of skin damage for each of the 13 body locations was recorded as one number that describes the worst level of skin damage for each body location. Sum the 13 numbers to identify IADS score. The possible range of scores was from 0 to 52. Score decreases with improvement. Inter-rater reliability reported was 0.98 %.

- 4- **Skin intervention protocol:** skin intervention protocol was developed based on literature review [7, 18, 15, 31-32]. It includes inspection, gentle cleansing, routine use of moisturizers, and a moisture barrier/skin protectant to minimize skin contact with feces (3 in 1 step). Content validity of the protocol was revised by 5 panel of expertise in the field of Medical Surgical Nursing and Nursing Education to determine its validity. The final protocol was limited to 11 items (table 1).

Table 1. A skin intervention protocol for patient with fecal incontinent for prevention and management of IAD.

<p>The Perineal assessment tool (PAT) and The Incontinence-Associated Dermatitis and Its Severity Instrument (IADS) were evaluated within 48 hours of admission and reevaluated daily and accordingly the genital area, buttocks and upper legs of whom at risk for IAD and/or affected:</p> <ol style="list-style-type: none">1- Cleanse by a disposable washcloth with 3 in 1 contains 3 % dimethicone (Comfort Shield Barrier Cloths).2- Use for daily routine perineal skin hygiene and every shift3- After each under-pad changes and immediately after each episode of incontinence.4- Drying by evaporation was recommended and no towel rubbing or patting was allowed after applying the perineal washcloth.5- If the perineal area was extremely soiled by stool. It is allowed to use soft washcloth and lukewarm water to remove soiling with gentle rubbing technique to dry skin then wiped the perineal area with the disposable cloth without rinsing or applying an additional barrier product.6- The comfort Shield Barrier Cloths were kept ready for use at the bedside of the patient.7- If clinical signs of cutaneous bacterial or fungal infection occurred, the patient was consulted. Antifungal, antibiotics or anti-inflammatory topical products were combined with perineal washcloth.8- Frequent change of linen and repositioning patient.9- Avoid wrapping the buttocks with diaper or brief.10- Use absorptive underpad.11- Implement skin intervention protocol for one week.
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2.6 Procedure

Once official permission was granted from the research committee and from the head managers of the selected hospital to proceed with the study, the researchers initiated data collection. Participants who met the inclusion criteria were approached to participate in the study. The researcher explained the purpose and nature of the study to the participants and their family members. Written consent was obtained from the participants who were conscious and communicative. Family members of unconscious participant signed a consent form. Once the participants recruited for study, they were randomly assigned to the study and control groups. They assessed within 48 hours of admission using Perineal Assessment Tool (PAT) and The Incontinence-Associated Dermatitis and Its Severity Instrument (IADS) to evaluate risk or affected for IAD for every patient within control and study group. Throughout the study, the perineal skin area was inspected and reevaluated daily in the morning shift by the researchers using the PAT for whom at risk and IADS for whom affected for each participant within study and control group and documented in the designed data sheet from day One to day Seven. Nurse's notes were revised for recorded perineal skin observation and evaluation during changing linens, cleansing soiled area, repositioning patient and changing under pads for every participant. Routine hygiene skin care was completed once a day and repeated whenever the perineal area was found to be soiled for the control group. Routine hygiene skin care include cleansing with a soft wash cloth with water and a pH neutral soap (pH range, 6.5-7.5), drying using a soft towel rubbing technique. No additional skin protectant was applied and under pads was used. When clinical signs of bacterial or fungal infection occurred, consultation occurred. For the study group, skin intervention protocol was implemented daily every shift and whenever the perineal area was soiled immediately after each episode of incontinence.

Skin intervention protocol of care was implemented for 7 consecutive days. All participants of the studied sample were followed for seven consecutive days. Data collection was conducted over a period of six months started from October 2014 and ended at March 2015.

2.7 Ethical Considerations

An official permission was taken from the research committee and hospital administrators. Also, each patient and guardian person for those unconscious was informed about the purpose and nature of the study and informed consent was taken from each patient and guardian. The researchers emphasized that participation in

the study is entirely voluntary; anonymity and confidentiality of the participants were assured through coding the data.

2.8 Pilot Study

A pilot study was carried out on 5 patients to assess the clarity and feasibility of the tools. The five Patients who participated in the pilot study were excluded from the study.

2.9 Data Analysis

Data was coded for entry and analyzed using SPSS Statistical Software Package Version 18. Data was presented using descriptive statistics in the form of frequencies and percentages, means and standard deviations. Data was described by summary tables and figures. T-test & Chi square were used. Statistical significance was set at P-value ≤ 0.05 .

III. Results

Table 2. revealed that the mean age of the participants was (38.65 ± 12.60 & 38.80 ± 11.05) of the study & control groups respectively. The majority of the sample were male is the dominant gender in the study group (60 %) while in the control group was (50 %). Regarding present medical diagnosis, stroke was the most prevalent diagnosis (45 %) while motor neuron disease was the least prevalent diagnosis (10 %) among study group and among control group were (35 %, 25 %) respectively. Additionally, most of the participants in the study and control group (50 %, 45 %) respectively had no past medical history. According to PAT and IADS instrument, the prevalence of high risk participants for IAD among study and control group was one third while two thirds were affected by IAD. Fig. 1 showed that causes of IAD (60 %, 45 %) had neurological conditions in study and control group respectively. In addition, 25 %, and 40 % of the participants had impaction with overflow among study and control group respectively. While, there was (40 %, 35 %) had more than one cause among study and control group respectively. Table 3. showed that there was a statistical significant difference between study and control group post intervention from day four till day seven among high risk participants .

Figure (2) showed that there was a significant reduction of IAD incidence among high risk participants between study and control group in day one, day four and day seven. In the study group, there was a significant reduction of the IAD incidence by the 4th day. While there was absent of IAD by the 7th day. Table 4. shows that there was a statistical significant difference between study and control group in relation to effectiveness of skin intervention protocol for IAD participants from the Fifth day to the Seventh day (P<000).

Table 2. Characteristics of the study and control group.

Variables	Study (n= 20) X \pm SD	Control (n= 20) X \pm SD	P-value
Age	38.65 \pm 12.60	38.80 \pm 11.05	0.48
t-test	.040		
	Study (n= 20) N (%)	Control (n= 20) N (%)	P-value
Gender:			0.53
Male	12 (60 %)	10 (50 %)	
Female	8 (40 %)	10 (50 %)	
Chi – square	.404		
Present diagnosis:			0.45
Stroke	9 (45%)	7 (35%)	
Motor neuron disease	2 (10%)	5 (25%)	
others	9 (45%)	8 (40%)	
Chi – square	1.59		
Past medical history:			0.44
No past history	10 (50%)	9 (45%)	
Hypertension	8 (40%)	6 (30%)	
Diabetes Mellitus	2 (10%)	5 (25%)	
Chi – square	1.62		
Patients at High risk for IAD			0.07
	6 (30 %) 9.33 \pm 2.16	6 (30 %) 11.00 \pm 1.549	
t-test	1.54		
Affected IAD patients according to IADS	14 (70 %) 33.70 \pm 9.40	14 (70 %) 36.64 \pm 10.93	0.22
t-test	0.76		

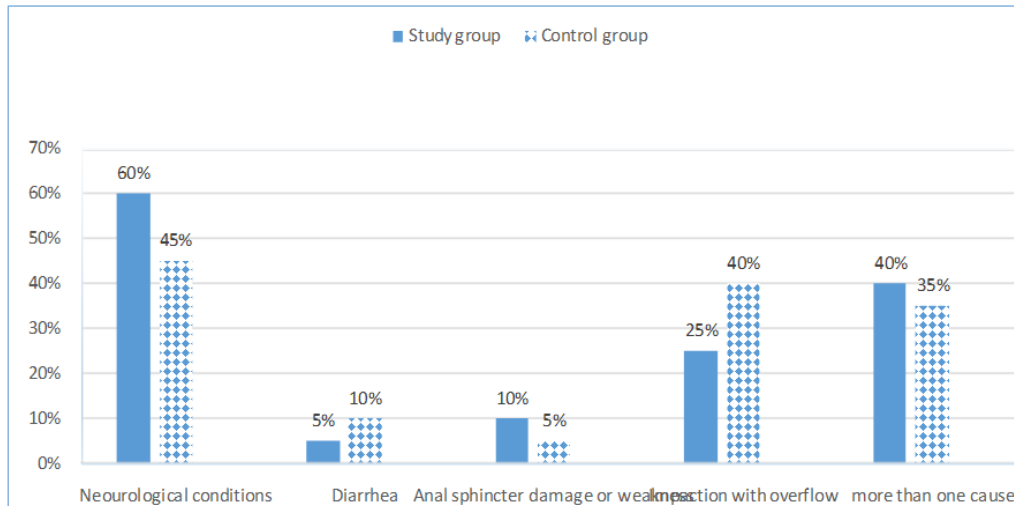


Figure 1. Causes of fecal incontinence associated dermatitis among study and control group

Table 3. Effectiveness of skin intervention protocol at high risk IAD participants in study and control groups over time.

Time	Study group X ± SD	Control group X ± SD	P-value
Day 1	9.33 ± 2.16	11.00 ± 2.55	0.12
Day 2	7.50 ± 1.22	9.00 ± 2.67	0.13
Day 3	5.50 ± 1.87	7.67 ± 1.21	0.02
Day 4	4.50 ± 1.64	7.00 ± 1.87	0.01
Day 5	3.00 ± 0.00	5.75 ± 1.89	< 0.001
Day 6	3.00 ± 0.00	5.00 ± 1.83	< 0.001
Day 7	3.00 ± 0.00	5.00 ± 1.83	< 0.001

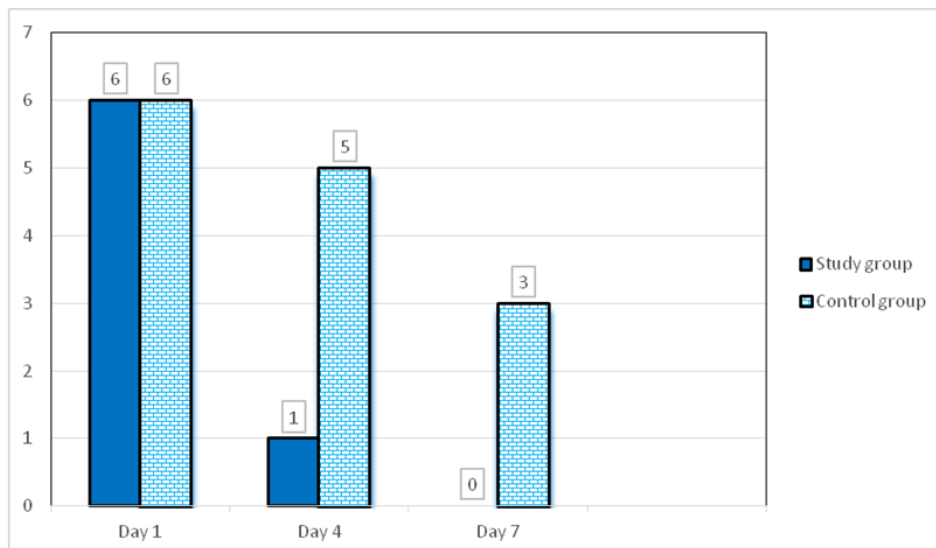


Figure 2. The effect of implementing skin intervention protocol on IAD among high risk participants

Table 4. The effect of skin intervention protocol for IAD participants on study and control group over time.

Time	Study Group X ± SD	Control Group X ± SD	P-value
Day 1	40.93 ± 12.04	36.64 ± 10.93	0.84
Day 2	36.50 ± 12.05	35.00 ± 10.18	0.64
Day 3	29.71 ± 7.06	33.07 ± 10.27	0.16
Day 4	22.86 ± 6.83	26.20 ± 8.66	0.014
Day 5	16.14 ± 3.03	26.50 ± 7.60	<0.001
Day 6	11.21 ± 3.89	23.19 ± 7.79	<0.001
Day 7	4.29 ± 1.16	19.25 ± 3.79	<0.001

IV. Discussion

To date, there is a lack of rigorously performed research studies addressing the effectiveness of different skin intervention regimens for prevention or treatment of IAD especially in acute care setting in adult despite the level of patient acuity is greater and the impact of incontinence-related skin breakdown may be more problematic [21]. The current study findings showed that one third of the participants were at high risk for IAD while two thirds were affected. The present findings are different from Driver, (2007) [11] who reported a 50% incidence rate in 16 patients with fecal incontinence. The findings are higher in the present study than what was reported by Bliss, et al., (2011) [16] with 36% incidence rate among 45 patients with fecal incontinence. The high incidence of IAD in the current study can be justified by the fact that the characteristics of study participants are different and the instruments used to measure IAD were different.

The current study findings showed that there was a significance difference between study and control groups post intervention, which indicate that using skin intervention protocol was effective and significantly reduced the incidence of IAD among participants in the study group. There was a highly statistical significant difference between study and control group from the 5th day to the 7th day ($P < 0.000$). These findings were consistent with Beeckman, et al (2010) [4] who reported that using soap and water is inadequate for prevention and management of IAD and using a structured perineal skin protocol of care was highly effective in reducing incidence of IAD among patients with IAD. Also, the results of the current study were consistency with Bale, et al., (2004) [33] who used a defined skin care regimen with perineal skin cleanser and moisturizer, application of polymer acrylate barrier film skin protectant and reported that reduction in the rate of IAD reduced from 25.3% prior to intervention to 4.7% post intervention.

The current findings are different from Lyder, et al., (1992) [24] who did not find differences in the incidence of IAD when using structured skin regimen of using cleanser, moisturizer, and moisture replant to the perineal area skin following each incontinence episode for four weeks and non-structured skin regimen.

In relation to the effect of skin intervention on the IAD severity, the current findings revealed that participants in the study group showed improvement by the end of the 7th day. The current study findings are consistent with Park and Kim (2014) [3] who reported that The structured skin care protocol reduced the severity of IAD, in the study group compared to the control group who received standard skin care (5.19 ± 3.41 vs 14.13 ± 11.7 , $t = 4.836$, $P < .001$), which indicating that the study group has less severe IAD than control group.

V. Conclusion

IAD is a prevalent problem that demands serious attention. Incontinence and IAD are significant issues that cause costly consequences. The implementation of skin intervention protocol of care was effective in the prevention of IAD among high risk patients and increasing healing rate and resulted in less-severe lesion of existing IAD among patients with fecal incontinent.

VI. Limitation of the study

1. The findings of the current study are limited in their generalizability because of the convenience sample. The lack of random sampling may contribute to sample selection bias and limits the generalization of the findings.
2. Another limitation relates to the small sample size of the current study and using a single setting for data collection.

VII. Recommendations

- Establish a preventive skin care protocols in the high-risk patient and aggressive management of incontinence-related dermatitis are essential for effective holistic management.
- Health care providers should be instructed about using skin care intervention protocol for prevention and management of IAD as a routine practice in acute setting.
- Frequent and ongoing assessment for IAD on admission is crucial in acute care setting
- Educate the care givers about skin care intervention protocol for prevention and management of IAD at home.
- Replication of the study with larger sample size is needed to determine the safety and effectiveness of commonly used products and procedures.
- Additional research is needed to determine the influence of acuity of illness on IAD and its severity because acuity of illness might influence the risk for IAD in the acute care setting.

VIII. Nursing Implications

- Structured perineal skin intervention, including cleansing with a product with a pH near to that of normal skin, is recommended to prevent and treat IAD.
- Promote application of products that incorporate a skin protectant into a 1-step cleansing solution or system, thus reducing the time required to adequately cleanse and protect the perineal skin in persons with fecal incontinence.

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