

RISK FACTORS OF DIAPER DERMATITIS IN CHILDREN UNDER 24 MONTHS OF
AGE IN MOSUL CITY

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ABSTRACT

Diaper dermatitis (DD) is a common inflammatory condition of the diaper-covered skin in infants and toddlers, influenced by inappropriate diaper-area care, dietary factors, and coexisting medical disease, superimposed on an infant skin barrier that is structurally more permeable and less mature than adult skin. This case-control study aimed to evaluate the risk factors for diaper dermatitis in children under 24 months of age in Mosul City, Iraq, and was conducted at Ibn Al-Atheer Teaching Hospital and Al-Mosul General Hospital over six months (January-June 2025), enrolling 280 children: 140 with clinically diagnosed DD (cases) and 140 without (controls), using a structured interviewer-administered questionnaire covering sociodemographic characteristics, diapering practices, and clinical/health information, with associations expressed as odds ratios (OR) and 95% confidence intervals. Exclusive formula feeding increased the risk of DD (OR=1.971), while exclusive breastfeeding was protective (OR=0.282); fewer than six diaper changes per day was a risk factor (OR=2.08), and cleaning with water alone was protective (OR=0.341); maternal illiteracy (OR=1.634) and more than one child currently using diapers (OR=1.727) were associated with increased risk; more than two previous episodes of DD (OR=2.967), oral antibiotic use (OR=1.831), diarrhea (OR=2.318), and oral thrush (OR=20.5) were significant risk factors; and regular use of baby powder (OR=6.091) and steroid-containing agents (OR=2.228) increased risk, whereas diaper creams were protective (OR=0.294). Feeding practice, diapering frequency and hygiene, maternal education, prior DD episodes, antibiotic use, diarrhea, oral thrush, and inappropriate topical agents are therefore significant risk factors for diaper dermatitis, while exclusive breastfeeding and diaper cream use are protective, and caregiver education together with rational use of topical agents is recommended to reduce the burden of DD.

KEYWORDS: Diaper dermatitis; risk factors; case-control study; infants; odds ratio; Mosul; Iraq.

1. INTRODUCTION

Infant skin differs structurally and functionally from adult skin. The stratum corneum, the outermost epidermal layer responsible for barrier function, is thinner and composed of smaller corneocytes in neonates and infants.^[1,2] This immaturity results in a less effective barrier, increased transepidermal water loss, and an underdeveloped acid mantle,^[3] with full maturation of barrier function not achieved until approximately two years of age.^[4,5] Consequently, infant skin is particularly vulnerable to dehydration, irritants, and infection.

Diaper dermatitis (DD) is an inflammatory eruption confined to the diaper-covered skin, including the buttocks, perianal area, inner thighs, genitalia, and

waistline.^[6] It affects approximately one-quarter of infants within the first four weeks of life and peaks between 9 and 12 months of age.^[7] Prolonged contact with urine and faeces in an occlusive, moist environment favours microbial colonisation, most frequently by *Candida albicans*, with *Staphylococcus aureus* and *Streptococcus pyogenes* as secondary pathogens.^[8] Clinically, DD ranges from mild erythema to erosive or ulcerative disease, and validated severity scales are used to grade disease from none to severe.^[9]

DD is the most frequent dermatosis of infancy, with a reported prevalence of 4-35% during the first two years of life; rates are up to three-fold higher in infants with diarrhoea, and under-reporting by caregivers likely leads

to underestimation of the true burden. Socioeconomic disadvantage, limited access to quality diapers, and crowded living conditions have also been implicated as contributors to a higher prevalence.^[10]

The pathogenesis of DD is multifactorial, driven by prolonged skin exposure to moisture and friction and by the enzymatic activity of faecal proteases and lipases, which is enhanced at elevated pH. Continuous wetness macerates the stratum corneum and damages its intercellular lipid lamellae, increasing susceptibility to friction and chemical irritation. Urease-mediated breakdown of urinary urea raises local pH above its normal range of 4.5-5.5, further increasing skin permeability and moisture retention.^[11]

Numerous risk factors for DD have been described. These include inappropriate diaper-area skin care and irritant cleansing products; friction between the diaper and skin; chemical irritants in diapers and wipes, such as fragrances, preservatives, and surfactants; dietary factors,

with formula feeding associated with higher rates of DD than breastfeeding and food allergy increasing susceptibility; immaturity of skin barrier function, particularly in premature infants; underlying medical conditions such as diarrhoea, atopic disease, oral thrush, and congenital anomalies of the urinary or lower gastrointestinal tract; use of broad-spectrum antibiotics, which disturbs gut and skin flora and favours *Candida* overgrowth; malnutrition and associated zinc deficiency, which impair skin integrity and immune defence and a history of previous DD episodes, reflecting persistence of underlying risk factors.^[12,13]

Diagnosis of DD is largely clinical, based on history and examination; laboratory testing (potassium hydroxide preparation, Gram stain) is reserved for suspected candidal or bacterial superinfection. Preventive care is commonly summarised by the “ABCDE” approach - Air exposure, Barrier creams, Cleansing, Dry diapering, and caregiver Education (Table 1).^[14]

Table 1: The ABCDE approach to the prevention of diaper dermatitis.^[14]

A	Air exposure of diaper skin as often as possible, minimising friction and superhydration.
B	Barrier creams applied regularly to clean diaper skin reduce friction and improve barrier function.
C	Cleansing with gentle cleansers to remove irritants and preserve an acidic skin pH.
D	Dry diapering: changes as often as necessary (every ~2 hours in newborns; every 3-4 hours in older infants) to limit overhydration and contact with irritants.
E	Education of caregivers for early recognition of DD and prompt access to healthcare advice.

Despite the high burden of DD, few studies from Iraq - and none recently from Mosul City - have examined its risk factors, despite the widespread use of unsupervised over-the-counter remedies that may themselves cause harm. This study aimed to evaluate the risk factors for diaper dermatitis among children under 24 months of age in Mosul City. The specific objectives were to describe the sociodemographic profile of the study sample; to explore the relationship between feeding type and DD; to assess the association between diapering practices and DD; to describe the relationship between medical history and DD; and to determine the association between previous DD episodes, oral antibiotic use, nutritional status, and DD.

2. PATIENTS AND METHODS

2.1 Ethical Considerations

Permission to conduct this study was obtained from the Directorate of Health in Nineveh on 17 February 2025, and the study was approved by the Local Scientific Council of the Arab Board of Health Specializations in Family Medicine, Iraq. The aims of the study were explained to all participants, and verbal consent was obtained; hospital administrations were informed of the nature and scope of the study, and all data were kept confidential and used only for the study.

2.2 Study Design, Setting, and Period

An analytical, hospital-based case-control study was conducted in Mosul City, northern Iraq, at the paediatric

consultation units of Ibn Al-Atheer Teaching Hospital (left bank of the Tigris) and Al-Mosul General Hospital (right bank), both of which serve patients from Mosul City and surrounding rural areas and receive an average of 60 patients daily. Data were collected over six months, from 2 January 2025 to 30 June 2025.

2.3 Study Sample and Group Definitions

A total of 280 children were enrolled using a convenience sampling technique: 140 children clinically diagnosed with DD by a paediatrician were allocated as cases, and 140 children without DD were allocated as controls. Cases were children under 24 months of age using diapers with a clinical diagnosis of DD; controls were children under 24 months of age using diapers with no DD.

2.4 Inclusion and Exclusion Criteria

Any child under 24 months of age, of either sex, attending the two study hospitals, whose mother consented to participate, was included. Children who did not use diapers or used them only at night, children older than 24 months, children whose mothers refused participation, and children with other skin diseases were excluded.

2.5 Data Collection Tool

Data were collected through a structured, interviewer-administered questionnaire comprising three domains: (i) sociodemographic characteristics of the child and family

(child's age and sex, mother's age, marital status and education, parental occupation, and residence); (ii) diapering practices (number of children in the household currently using diapers, diaper type, daily frequency of diaper changes, cleaning materials, and regular topical agents applied after diaper change); and (iii) clinical/health information (dietary habits, antibiotic use within the last month, presence of oral thrush or diarrhoea, previous DD episodes, nutritional status, birth defects, and allergic disease).

Operational definitions were as follows: a low frequency of diaper changes was defined as fewer than six changes per day, or fewer than three during the daytime; recent antibiotic use was positive if the child received an oral antibiotic within the preceding month; diarrhoea was defined as three or more loose or liquid stools per day; nutritional status was classified using age- and sex-appropriate growth charts, with weight-for-age below -2 Z-score indicating malnutrition; and allergic disease was considered positive if the child had a history of at least one atopic disorder (cow's milk protein allergy, allergic rhinitis, asthma, or atopic dermatitis).^[15]

2.6 Pilot Study

A pilot study of 20 children (10 cases and 10 controls) was conducted over two weeks to assess the completeness of the questionnaire and the feasibility of data collection. The

3. RESULTS

This case-control study involved 280 subjects: 140 children with diaper dermatitis (cases) and 140 without (controls).

3.1 Demographic Characteristics of Children

The highest proportion of children in both groups was aged 7-<13 months, and the age group showed no significant association with DD. Diaper dermatitis was more frequent among female children (53.6% vs 46.4%), but the difference response rate was 90%, and the questionnaire was refined before the main study based on the feedback obtained.

2.7 Statistical Analysis

Data were tabulated using Microsoft Excel 2022 and analysed using Minitab statistical software, version 21. For each risk factor, a 2×2 table was used to calculate the odds ratio (OR), chi-square statistic, and P-value. An OR greater than 1 indicated an increased risk of DD associated with exposure, an OR less than 1 indicated a protective effect, and an OR of 1 indicated no association. The approximate 95% confidence interval (CI) around the OR was calculated as 95% CI = OR (1 ± 1.96/χ), where χ is the square root of the chi-square statistic. The chi-square test (or Fisher's exact test where appropriate) was used to test for statistical association between cases and controls, with P<0.05 considered statistically significant. was not statistically significant (OR=0.650, P=0.073) (Table 2).

3.2 Sociodemographic Characteristics of Parents

Maternal age under 20 years was a significant protective factor (OR=0.408, P=0.05). No formal maternal education was significantly associated with DD (OR=1.634, P=0.042), as was having more than one child currently using diapers (OR=1.727, P=0.032). Marital status, maternal occupation, residence, and paternal occupation showed no significant association (Table 3).

Table 2: Comparison of demographic characteristics of children between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Age in months	<7 months	43 (30.7)	41 (29.3)	1.070 (0.642-1.785)	0.794
	7-<13 months	48 (34.3)	43 (30.7)	1.177 (0.713-1.942)	0.523
	13-<19 months	29 (20.7)	30 (21.4)	0.958 (0.539-1.702)	0.883
	19-<24 months	20 (14.3)	26 (18.6)	0.731 (0.387-1.381)	0.333
Sex	Male	65 (46.4)	80 (57.1)	0.650 (0.406-1.042)	0.073
	Female	75 (53.6)	60 (42.9)	—	—

*Chi-square test used.

Table 3: Comparison of sociodemographic characteristics of parents between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Mother's age	<20 years	7 (5.0)	16 (11.4)	0.408 (0.162-1.025)	0.05
	20-<30 years	76 (54.3)	74 (52.9)	1.059 (0.662-1.694)	0.811
	30-<40 years	49 (35.0)	46 (32.9)	1.100 (0.671-1.805)	0.705
	≥40 years	8 (5.7)	4 (2.9)	2.061 (0.606-7.007)	0.238
Marital status	Married	138 (98.6)	138 (98.6)	1.000 (0.139-7.200)	1.000
	Divorced	2 (1.4)	2 (1.4)	—	—
Maternal education	No formal education	73 (52.1)	56 (40.0)	1.634 (1.018-2.624)	0.042
	Primary	34 (24.3)	44 (31.4)	0.700 (0.414-1.184)	0.183

Parameter	Category	DD (n=140) No. (%)	D (n=140) No. (%)	OR (95% CI)	P-value*
	Secondary	15 (10.7)	23 (16.4)	0.610 (0.304-1.226)	0.163
	Higher education	18 (12.9)	17 (12.1)	1.068 (0.526-2.168)	0.857
Maternal occupation	Unemployed	124 (88.6)	132 (94.3)	0.727 (0.533-0.990)	0.088
	Employed	10 (7.1)	7 (5.0)	1.190 (0.785-1.804)	0.453
	Student	6 (4.3)	1 (0.7)	1.746 (1.261-2.419)	0.056
Residence	Urban	90 (64.3)	87 (62.1)	1.097 (0.675-1.783)	0.710
	Rural	50 (35.7)	53 (37.9)	—	—
Husband's occupation	Unemployed	32 (22.9)	42 (30.0)	0.691 (0.405-1.181)	0.175
	Employed	108 (77.1)	98 (70.0)	—	—
Children using diapers	More than one child	56 (40.0)	39 (27.9)	1.727 (0.351-0.956)	0.032
	One child	84 (60.0)	101 (72.1)	—	—

*Chi-square test used.

3.3 Type of Feeding

Exclusive breastfeeding was significantly protective against DD (OR=0.282, P=0.003), whereas exclusive formula feeding significantly increased risk (OR=1.971, P=0.017). Mixed feeding and feeding with milk plus a normal diet showed no significant association (Table 4, Figure 1).

3.4 Diaper Type and Diapering Practice

Changing diapers fewer than six times per day was significantly associated with DD (OR=2.08, P=0.002). Cleaning with water only was significantly protective (OR=0.341, P=0.003). Diaper type, day/night change frequency, and other cleaning materials showed no significant association (Table 5).

Table 4: Comparison of the type of feeding between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Type of feeding	Exclusive breastfeeding	7 (5.0)	22 (15.7)	0.282 (0.116-0.685)	0.003
	Exclusive formula feeding	42 (30.0)	25 (17.9)	1.971 (1.122-3.464)	0.017
	Mixed feeding	9 (6.4)	16 (11.4)	0.532 (0.227-1.249)	0.142
	Milk and a normal diet	82 (47.1)	77 (42.1)	1.224 (0.764-1.963)	0.400
	Normal diet	16 (11.4)	18 (12.9)	0.875 (0.426-1.794)	0.714

*Chi-square test used.

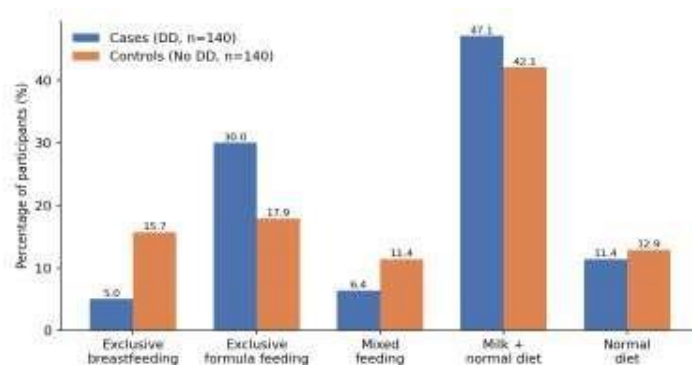


Figure 1: Comparison of feeding types between children with diaper dermatitis (cases) and those without (controls).

Table 5: Comparison of diaper type and diapering practice between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Type of diaper used	Cloth diaper	3 (2.1)	1 (0.7)	3.044 (0.313-2.694)	0.314
	Disposable diaper	137 (97.9)	139 (99.3)	—	—
Frequency/day (total)	<6 times	75 (53.6)	50 (35.7)	2.08 (1.28-3.35)	0.002
	≥6 times	65 (46.4)	90 (64.3)	—	—
Frequency/daytime	<3 times	14 (10.0)	10 (7.1)	1.444 (0.619-3.367)	0.402
	≥3 times	126 (90.0)	130 (92.9)	—	—
Changing at night	No	79 (56.4)	77 (55.0)	1.059 (0.660-1.697)	0.810
	Yes	61 (43.6)	63 (45.0)	—	—

Cleaning material	Soap and water	96 (68.6)	94 (67.1)	1.068 (0.646-1.763)	0.798
	Water only	11 (7.9)	28 (20.0)	0.341 (0.162-0.716)	0.003
	Wet wipes/paper tissue	7 (5.0)	2 (1.4)	3.632 (0.741-17.79)	0.090
	Water + paper/wet wipes	26 (18.6)	16 (11.4)	1.768 (0.902-3.464)	0.094

*Chi-square test used.

3.5 Topical Agents Applied to the Diaper Area

Regular use of baby powder was a significant risk factor (OR=6.091, $P<0.001$), and steroid-containing agents were also significantly associated with increased risk (OR=2.228, $P=0.025$). Diaper creams were significantly protective (OR=0.294, $P=0.001$). No significant differences were found for non-use of any product or use of generic moisturiser/Vaseline (Table 6, Figure 2).

3.6 Medical History of Children

Diarrhoea (OR=2.318, $P=0.001$) and presence of oral thrush (OR=20.5, $P=0.001$) were significantly associated with DD.

Allergic disease and birth defects showed no significant association (Table 7).

3.7 Previous Diaper Dermatitis, Nutritional Status, and Antibiotic Use

All categories of previous DD episodes showed highly significant associations ($P<0.001$): none and ≤ 2 previous episodes were protective (OR=0.274 and OR=0.222, respectively), while more than 2 previous episodes were a risk factor (OR=2.967). Oral antibiotic use in the preceding month was a significant risk factor (OR=1.831, $P=0.012$). Nutritional status showed no significant association (Table 8).

Table 6: Comparison of topical agents applied regularly to the diaper area between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Topical application	Nothing	60 (42.9)	67 (47.9)	0.817 (0.510-1.309)	0.401
	Generic moisturizer /Vaseline	14 (10.0)	25 (17.9)	0.511 (0.253-1.031)	0.058
	Baby powder	30 (21.4)	6 (4.3)	6.091 (2.447-15.163)	<0.001
	Diaper creams	10 (7.1)	29 (20.7)	0.294 (0.137-0.631)	0.001
	Steroid-containing agent	26 (18.6)	13 (9.3)	2.228 (1.093-4.542)	0.025

*Chi-square test used.

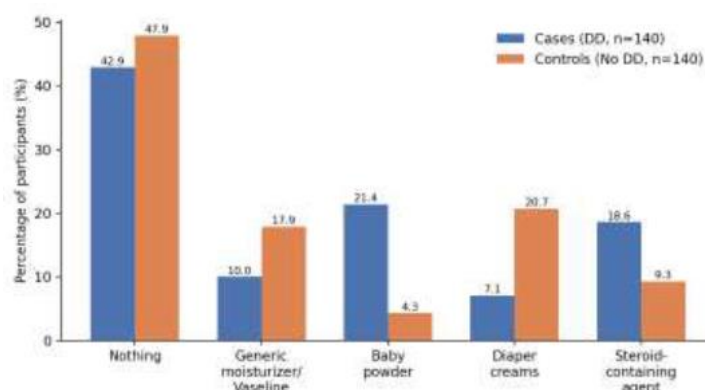


Figure 2: Comparison of topical agents regularly applied to the diaper area between children with diaper dermatitis (cases) and those without (controls).

Table 7: Comparison of medical diseases of children between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	No DD (n=140) No. (%)	OR (95% CI)	P-value*
Allergic disease	Yes	19 (13.6)	17 (12.1)	1.136 (0.564-2.290)	0.721
	No	121 (86.4)	123 (87.9)	—	—
Diarrhoea	Yes	57 (40.7)	32 (22.9)	2.318 (1.379-3.894)	0.001
	No	83 (59.3)	108 (77.1)	—	—
Presence of oral thrush	Yes	18 (12.9)	1 (0.7)	20.5 (1.714-2.396)	0.001
	No	122 (87.1)	139 (99.3)	—	—
Birth defect	Yes	4 (2.9)	2 (1.4)	2.029 (0.366-11.263)	0.409
	No	136 (97.1)	138 (98.6)	—	—

*Chi-square test used.

Table 8: Comparison of previous diaper dermatitis, nutritional status, and oral antibiotic use between cases and control groups.

Parameter	Category	DD (n=140) No. (%)	D (n=140) No. (%)	OR (95% CI)	P-value*
Previous DD episodes	None	18 (12.9)	49 (35.0)	0.274 (0.150-0.502)	<0.001
	≤2 times	20 (14.3)	60 (42.9)	0.222 (0.124-0.397)	<0.001
	>2 times	102 (72.9)	31 (22.1)	2.967 (0.221-3.962)	<0.001
Nutrition status	Malnourished	32 (22.9)	26 (18.6)	1.30 (0.727-2.323)	0.376
	Well nourished	108 (77.1)	114 (81.4)	—	—
Use of antibiotic	Yes (last month)	78 (55.7)	57 (40.7)	1.831 (1.140-2.943)	0.012
	No	62 (44.3)	83 (59.3)	—	—

*Chi-square test used.

4. DISCUSSION

Diaper dermatitis (DD) is one of the most prevalent skin conditions of infancy and early childhood, causing discomfort for infants and concern for caregivers. This study, conducted among 280 children in Mosul City, identified several significant risk and protective factors for DD.

The highest prevalence of DD was observed in the 7- < 13-month age group, with no significant association between age and DD, consistent with Alghamdi et al. (2022).^[16] DD was more frequent in female than male children (53.6% vs 46.4%), although not statistically significant; a similar non-significant female predominance has been reported in Saudi Arabia.^[16] and Bangladesh.^[17]

Maternal age under 20 years was a significant protective factor, in contrast to Inusah et al. (2023) in Ghana, who found no significant effect of maternal age.^[18] Marital status showed no association with DD, consistent with Ng'ang'a (2019).^[19] Mothers with no formal education had significantly higher rates of DD in their children, consistent with findings from Ghana.^[18] and Bangladesh.^[17] Most mothers in both groups resided in urban areas; a Cameroonian study similarly reported higher urban prevalence.^[20] Paternal and maternal occupation showed no significant association with DD in this study, in contrast with a Saudi study reporting a significant association between maternal employment and DD risk,^[21] a discrepancy that may reflect differing socioeconomic contexts. Having more than one child currently using diapers was a significant risk factor, plausibly reflecting the financial and caregiving strain of managing multiple children in diapers simultaneously.

Exclusive breastfeeding was significantly protective against DD, consistent with studies from Saudi Arabia.^[16] and Turkey,^[22] likely reflecting the immunological and anti-inflammatory properties of breast milk. Conversely, exclusive formula feeding significantly increased risk, in agreement with Ofovwé et al. (2024),^[23] possibly related to alterations in stool pH and consistency. Mixed feeding and introduction of solid foods showed no significant effect, consistent with Alghamdi et al. (2022),^[16] although Inusah et al. (2023) reported a significant association for solid food introduction,^[18] a discrepancy that may reflect

differences in study populations or confounding diapering practices.

Diaper type (disposable vs cloth) showed no significant association with DD, consistent with Mohamed et al. (2021) in Saudi Arabia,^[24] although Sukhneewat et al. (2019) identified cloth diaper use as a significant risk factor,^[25] a difference potentially explained by variation in study populations and socioeconomic factors. Changing diapers fewer than six times per day was a significant risk factor, consistent with Sukhneewat et al. (2019),^[25] day/night-specific change frequency showed no significant association, consistent with Alghamdi et al. (2022),^[16] although Sukhneewat et al. (2019) identified infrequent night-time changes as significant,^[25] a discrepancy that may reflect diaper changing being only one component of broader preventive care. Cleaning with water alone was significantly protective, consistent with Alghamdi et al. (2022),^[16] supporting avoidance of chemical irritants as a key preventive strategy.

Regular use of baby powder was a strong, significant risk factor, consistent with Jewaro et al., who also reported a significant association.^[26] Diaper creams were significantly protective, corroborated by studies from Nigeria.^[27] and Jordan.^[28] Steroid-containing agents were significantly associated with increased risk, in contrast to a Nigerian study that found no significant association;^[29] this discrepancy likely reflects differing patterns of steroid use, and it is important to distinguish appropriate short-term therapeutic use of low-potency steroids from inappropriate prolonged use for prevention, since chronic corticosteroid application can cause skin atrophy, telangiectasia, and a compromised skin barrier that paradoxically worsens DD.

A history of diarrhoea was significantly associated with DD, consistent with Sukhneewat et al. (2019),^[25] attributable to increased faecal enzyme activity and faster gastrointestinal transit.^[7] The presence of oral thrush showed a strong significant association, consistent with Ng'ang'a (2019),^[19] reflecting gastrointestinal Candida colonisation that can seed the perineal skin, particularly where the skin barrier is already compromised.^[30] Allergic disease and birth defects were not significantly associated with DD, consistent with Alghamdi et al. and Sukhneewat et al..^[16,25]

More than two previous episodes of DD were a significant risk factor for recurrence, consistent with Sukhneewat et al. (2019).^[25] Nutritional status showed no significant association, in contrast to findings by Ofovwé et al., possibly reflecting a higher prevalence of nutritional deficiency in their study population.^[23] Oral antibiotic use within the preceding month was significantly associated with DD, consistent with Jha and Singh and Owa et al.,^[27] likely reflecting antibiotic-induced disruption of gut and skin flora favouring *Candida* overgrowth.

5. CONCLUSION AND RECOMMENDATIONS

This study identified several significant risk factors for diaper dermatitis among children under 24 months of age in Mosul City: exclusive formula feeding, infrequent diaper changes, maternal illiteracy, having more than one child currently using diapers, regular use of baby powder or steroid-containing agents, diarrhoea, oral thrush, more than two previous episodes of DD, and recent oral antibiotic use. Exclusive breastfeeding, cleaning with water alone, and regular use of diaper creams were significant protective factors.

Based on these findings, it is recommended that healthcare workers educate mothers - particularly new mothers - on the value of exclusive breastfeeding during the first six months of life; promote good diapering practices, including adequate change frequency and cleansing with water, while discouraging the use of baby powder; encourage the use of barrier/diaper creams as part of routine skin care for at-risk children; restrict the use of steroid-containing preparations to appropriate medical supervision rather than routine prevention; and ensure early diagnosis and treatment of diarrhoea and oral candidiasis to prevent worsening of diaper dermatitis.

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