

# Parent Concern and Awareness of Corticosteroid use in Pediatric Patients with Atopic Dermatitis in Al-Majmaah, Saudi Arabia

YOUSSEF ALROHAIMI<sup>1</sup>, RAGHAD A. ALTURKI<sup>2</sup>, ATHEER A ALJITHALIN<sup>2</sup>, RENAD B ALANAZI<sup>2</sup>, OHOOD L ALMIMONY<sup>2</sup>

<sup>1</sup>Department of Pediatrics, College of Medicine, Majmaah University, Almajmaah-11952, Saudi Arabia.

<sup>2</sup>Medical student, College of Medicine, Majmaah University, Almajmaah-11952, Saudi Arabia.

Correspondence to: Yousef Alrohaimi, Email: [y.alrohaimi@mu.edu.sa](mailto:y.alrohaimi@mu.edu.sa)

## ABSTRACT

**Background:** Atopic dermatitis has been considered a multifactorial disease and is a chronic, relapsing, and highly pruritic skin disease; usually presents with skin itchiness which is considered the most burdensome symptom, followed by skin redness and dryness, chronic pruritus, and sleep disturbance, as well as the time and expense associated with treatment, are often most distressing for patients and families. Atopic skincare and treatment include skin hydration, pharmacologic therapy, and avoidance of relevant triggers. Corticosteroids (TCS) of appropriate strength are considered the first-line therapeutic agent.

**Objective:** To study the parents' concern and awareness of corticosteroid use in pediatric patients with atopic dermatitis in Al-Majmaah governorate, Saudi Arabia in 2021.

**Methodology:** A community-based descriptive cross-sectional study was performed. The data was collected using an electronic questionnaire and analyzed using SPSS v.23.

**Results:** 403 respondents were enrolled in the study where most of the fathers (46.2%) were within the age group of 30-45 years, and a half (50.6%) of mothers were between 30-45 years. Most children (30%) have itchy skin for 2-3 days per week due to eczema, and 174 (43.2%) have dry, rough skin every day. The mean score for the knowledge and beliefs was  $49.8 \pm 19.9$ ,  $76.6 \pm 20.9$  for fears, and  $72.4 \pm 21.8$  for behavior. More than one-third of respondents (46.2%) almost agreed that TCS could pass into a child's bloodstream, and 157 (45.1%) of those who used steroids before almost agreed that it's beneficial. More than one-third of our respondents (36.2%) always get their information regarding TCS from dermatologists. Marital status significantly affects Topical Corticosteroid Phobia (TOPICOP) score ( $P$ -value = 0.003), where divorced have the highest mean score compared to married or widows.

**Conclusion:** The TOPICOP score for mean knowledge and beliefs was slightly lower than the global TOPICOP score. TCS can cause skin damage, as reported by nearly half participants. Slightly less than half of them are afraid of putting cream (TCS) on a child's skin in certain zones like the chin and the eyelids where the skin is thinner. The most reported information source about TCS for nearly half of the participants was doctors. No statistically significant association was found between participants' age groups, occupation, and educational level and global TOPICOP score. However, a significant association was found between marital status and TOPICOP score.

**Keywords:** Atopic dermatitis, Corticosteroids, Saudi Arabia, Pediatrics, TOPICOP score, Al-Majmaah

## INTRODUCTION

Atopic dermatitis (AD) is a chronic, relapsing, and highly pruritic skin disease, which is considered a common disease that develops mostly in early childhood that has a characteristic age-dependent distribution affecting up to 10-25% of children in most developed and some developing countries, with approximately 50% of these patients experiencing an eruption in their first year of life and more than 85% before the age of 5 years<sup>1,2</sup>. It has been considered a multifactorial disease, including genetic predisposition, and immunologic abnormalities, linked with an elevation in the total IgE antibodies level that appears to be correlated with disease severity<sup>3</sup>. In addition, patients can also have an elevation in allergen-specific IgE levels indicating sensitization; aside from that, disturbances in skin barrier function have been associated with AD by Loss-of-function variants in the filaggrin gene (FLG), environmental triggers including irritation, epicutaneous sensitization, and infectious triggers<sup>2,4,5</sup>.

AD pediatric patients usually present with skin itchiness which is considered the most burdensome symptom, followed by skin redness and dryness<sup>6</sup>. Sleep disturbance occurs in approximately 60% of children, and parents of children with AD are four to eight times more likely to have an average of less than six hours of sleep per night compared to caregivers of healthy children<sup>7</sup>. Chronic pruritus and sleep loss, as well as the time and expense associated with treatment, are often most distressing for patients and families. Moreover, it has been associated with poor school

performance, poor self-esteem, and family dysfunction where patients often feel isolated from their peers due to disease-related lifestyle restrictions<sup>8-10</sup>. Regarding management, atopic skincare

and treatment include skin hydration, pharmacologic therapy and avoidance of relevant triggers, which represents an important consideration in AD management<sup>2,5</sup>. Topical CS of appropriate

strength is considered the first-line therapeutic agent, particularly effective during disease exacerbation. However, some parents of children with atopic dermatitis are hesitant to use TCS because of a generalized fear of steroids, which might aggravate the disease.

In Korea, research was done on the fear of parents of children with atopic eczema of using topical corticosteroids. It turns out that 67.5% of the parents were afraid about their children using steroids. Steroid phobic parents were less likely to adhere to therapy. Skin shrinkage and thinning were the most well-known side effects of TCS (71.9%). The internet was the most common source of steroid-related misinformation (49.2%); skin thinning was the most common worry, followed by TCS's possible impact on growth and development<sup>12</sup>.

The use of topical corticosteroids by 300 parents of infants with eczema in Hangzhou, China, was evaluated to see how much knowledge and fear the parents had about them. The results showed that 85.7% of the children ( $n = 257$ ) had used them, with 12.8% ( $n = 33$ ) having them applied for only 13 days per episode. In a survey of parents, 25% ( $n = 75$ ) refused to use steroid ointment prescribed to them, while 32.3 percent ( $n = 97$ ) refused to use it on their children despite receiving a prescription. As steroid therapy progressed, 95.7% of parents (246) expressed worry about the possible negative effects. Due to worries about topical corticosteroids, 128 parents (42%) did not use an ointment to treat the recurrence of eczema<sup>13</sup>.

According to a multicenter Italian study, parents of children with atopic dermatitis have a fear of topical corticosteroids. According to a survey of 300 participants, 81% acknowledged having concerns about using corticosteroids for various reasons: feeling that TCS therapeutic benefits do not outweigh the downsides; believing that TCS may be hazardous regardless of the individual adverse effect. In addition, several people were worried about using too much cream<sup>14</sup>.

An investigation on the fear of topical corticosteroids conducted in the Netherlands in 2019 found that parents of children with atopic dermatitis and the doctors who treat them had a corticophobia score of 44%<sup>15</sup>.

To determine how much parental knowledge of atopic dermatitis in children is lacking, researchers in Saudi Arabia included 510 people from major cities at random in a study that indicated that 73.9% of parents were well-informed about the condition. People who were married and had three or more children (aged 25-39) had the highest knowledge. The highest level of awareness was observed in parents with university education, whereas the lowest level of awareness was observed in parents with primary education. Employed parents had a higher level of awareness when compared with non-employed<sup>16</sup>.

AD is a chronic, relapsing, and highly pruritic skin disease, which considered a common disease that develops mostly in early childhood, affecting up to 10-25% of children, where's TCS considered the first-line therapeutic agent, yet 67.5% of the parents show steroid phobia toward TCS use in their children with atopic dermatitis. In addition, several studies showed that CS had been used improperly for pediatric patients with eczema by many parents due to their phobia of using it and unfounded concerns about its potential adverse effects. Which eventually can impact the adherence to the treatment that can lead to unnecessary exacerbations of their conditions; thus, measuring the awareness and concerns among the caregivers of these children could help to improve their knowledge and affect their children's compliance to the treatment.

The main objectives of this study include studying the parent's concern and awareness of corticosteroid use in pediatric patients with atopic dermatitis in the Al-Majmaah governorate of Saudi Arabia in 2021.

## METHODOLOGY

**Study setting:** Community-based study.

**Study design:** A descriptive cross-sectional study to estimate the prevalence of corticosteroid fear among parents of atopic dermatitis pediatric patients.

**Study population:** Target participants are parents of atopic dermatitis children living in Al-Majmaah governorate, Saudi Arabia, from birth to 14 years old.

### Inclusion

- Parents of a child diagnosed with atopic dermatitis from birth till 14 years old.
- Residents living in Al-Majmaah governorate.
- Males and females
- Saudi and non-Saudi children

### Exclusion

- Parents of any child who is not diagnosed with atopic dermatitis and over 14 years old.
- Residents living outside Al-Majmaah governorate.

### Sampling

**Sample size and power:** The sample size was calculated based on the sample size formula:

$$n = \frac{Z^2 \times p \times q}{d^2} = \frac{1.96^2 \times 0.44 \times (1-0.44)}{0.05^2} = 378.6$$

N = sample size, d = Error accepted, P = prevalence, Z = standard, Normal Deviate (q) = 1-p.

A sample size of 400 was selected.

### Variables, definitions, and data sources

- Age of the parents and their children.
- Gender of the parents and their children.
- Nationality of the parents and their children.
- City parents and their children live in.
- Marital status of the parents.
- Severity of atopic dermatitis.
- Education.

**Data collection:** The data was collected by using an electronic questionnaire.

**Data management:** The electronic quarantine was distributed among parents, and informed consent was taken from the participants before answering any questions. The data was stored in a secured database where participants' information was fully confidential, and only researchers were allowed to reach it.

**Data analysis plan:** The data were analyzed by using the SPSS software program v.23. One way ANOVA test was applied to determine the difference between quantitative variables. A P-value of <0.05 was considered statistically significant.

### Ethical considerations:

- 1 Ethical approval from the ethical committee at Majmah University was taken before the conduction of the study
- 2 The confidentiality of participants was protected, and no names or personal information was requested.
- 3 Informed consent was taken from all the participants before filling out the questionnaire.

## RESULTS

**Socio-demographic Data:** A total of 403 respondents were enrolled in the study, most of the fathers (46.2%) were within the age group of 30-45 years, and only 5 (1.2%) were above 70 years. Almost half of the mother's age (50.6%) were between 30-45 years, and only 8 (2%) were above 70. 132 (32.8%) of children were between 2 - 5 years. Most parents (93.8%) were married, and 11 (2.7%) were divorced. More than one-third (42.7%) of the respondents have a family size of 2-4 members, and 171 (42.4%) have a family size of 5-7 members, only 8 (2%) have more than 11 members. Regarding the educational status of the father, more than one-third (41.9%) of them have a bachelor's degree, 123 (28%) in secondary school, and only 4 (1%) were uneducated. Regarding mother's education also, more than half (53.6%) had bachelor's degree, and only 8 (2%) were uneducated. Most of the fathers were employed (87.85%), and most mothers were unemployed (60.8%). About half of the respondents (50.9%) lived in villas (**Table 1**).

Table 1: Socio-demographic information of the participants.

Variable	Categories	Frequency	Percent
Age of the father (Years)	< 30	34	8.4
	30-45	186	46.2
	46-55	116	28.8
	56-70	49	12.2
	> 70	5	1.2
	Not involved	13	3.2
Age of the mother (Years)	< 30	84	20.8
	30-45	204	50.6
	46-55	78	19.4
	56-70	28	6.9
	> 70	8	2
	Not involved	1	0.2
Age of the child (Years)	Infant (< 1)	66	16.4
	2-5	132	32.8
	5-12	110	27.3
	> 12	95	23.6
Social status of the parents	Married	378	93.8
	Widow	14	3.5
	Divorced	11	2.7
Number of family members	2-4	172	42.7
	5-7	171	42.4
	8-10	52	12.9
	> 11	8	2
Father's educational level	Uneducated	4	1
	Primary	18	4.5
	Intermediate	25	6.2
	Secondary	113	28
	Diploma	22	5.5
	Bachelor's degree	169	41.9
	More than bachelor's degree	52	12.9
Mother's educational level	Uneducated	8	2

	Primary	17	4.2
	Intermediate	28	6.9
	Secondary	99	24.6
	Diploma	16	4
	Bachelor's degree	216	53.6
More than a bachelor's degree		19	4.7
Father's job	Employee	354	87.8
	Not employee	49	12.2
Mother's job	Employee	158	39.2
	Not employee	245	60.8
Residence of the child and the parent	Apartment	109	27
	Villa	205	50.9
	Slum house	89	22.1

**Atopic Dermatitis assessment:** When assessing atopic dermatitis severity over the last week, most of the children (30%) have itchy skin 2-3 days per week due to their eczema, and (24.8%) have itchy skin every day, whereas (25.6%) have no itchy skin over the last week. For most children (58.1%), sleep is not disturbed by their eczema. Only 17 (4.2%) have their skin bleed every day of eczema, but the majority (61.8%) have no bleeding. 73 (18.1%) have skin weeping or oozing clear fluid every 2 – 3 days, and 21 (5.2%) have eczema oozing every day, but 279 (69.2%) have no oozing. While 84 (20.8%) have cracked skin every day and 76 (18.9%) have flaky skin every day, and 147 (36.5%) have no flaky skin. 174 (43.2%) have dry, rough skin every day, and only 68 (16.9%) for 2-3 days (**Table 2**).

**TOPICOP Score:** The mean knowledge and beliefs score was found to be 49.8±19.9, the fear's mean was 76.6±20.9, and regarding behavior score, the mean was found to be 72.4±21.8. The mean global TOPICOP score was found to be 62.2±16.7. Regarding knowledge and beliefs about using TCS, more than one-third of respondents (46.2%) almost agreed that TCS could pass into a child's bloodstream, but 46 (11.4%) disagreed. The majority of the participants (44.2%) do not agree with the

statement that TCS can lead to infections, but 28 (6.9%) agree. 141 (35%) don't think TCS can increase a child's weight. 170 (42.2%) almost agree that TCS can damage a child's skin but 32 (7.9%) totally disagree. 172 (42.7%) almost agree that TCS will affect their child's future health. More than half (50.9%) do not agree that TCS can lead to asthma.

Concerning fears of using TCS, more than half (62.5%) totally agreed that they were afraid of putting cream (TCS) on a child's skin in certain zones like the eyelids where the skin is thinner. 165 (40.9%) almost agreed they do not know of any side effects but were still afraid of TCS. 193 (47.9%) were afraid of applying too much cream on their child's skin (TCS). Only 24 (6%) totally disagree that the idea of taking TCS burdens them.

Regarding behavior, more than one-third (41.4%) almost agreed that they will wait before treating their child with TCS, and 166 (41.2%) totally agree to stop treatment for their child as soon as possible. 220 (54.6%) need reassurance about TCS to use it. The majority of respondents (32.5%) almost agreed that TCS can be addictive. Only 99 (24.6%) totally disagree to prefer to use TCMS/ herbal medications before using TCS. 187 (46.4%) totally agree to use something that does not contain steroids even if it is more expensive. 157 (45.1%) of those who used steroids before almost agreed that its beneficial and 156 (44.8%) reported side effects (**Table 3**).

**Source of information regarding TCS:** More than one-third of our respondents (36.2%) always get their information regarding TCS from dermatologists, and only 41 (10.2%) never get information from them. On the other hand, 164 (40.7%) sometimes get their information from other doctors, and 192 (47.6%) from friends and family. Also, 159 (39.5%) sometimes get their information regarding TCS from the internet and the media. More than half of participants (60.8%) always trust dermatologists regarding TCS information, and only 8 (2%) always distrust them. 205 (50.9%) sometimes trust other doctors, and 209 (51.9%) sometimes trust friends and family. 180 (44.7%) sometimes trust the internet and the media (**Table 4**).

Table 2: Assessment of atopic dermatitis severity.

Question	Everyday	4-5 days	2-3 days	Didn't happen
11. How many days has your child's skin been itchy because of eczema?	100 (24.8%)	77 (19.1%)	123 (30.5%)	103 (25.6%)
12. How many nights has your child's sleep been disturbed by their eczema?	22 (5.5%)	39 (9.7%)	108 (26.8%)	234 (58.1%)
13. How many days has your child's skin been bleeding because of eczema?	17 (4.2%)	45 (11.2%)	92 (22.8%)	249 (61.8%)
14. How many days has your child's skin been weeping or oozing clear fluid because of their eczema?	21 (5.2%)	30 (7.4%)	73 (18.1%)	279 (69.2%)
15. How many days has your child's skin been cracked because of eczema?	84 (20.8%)	87 (21.6%)	99 (24.6%)	133 (33%)
16. How many days has your child's skin been flaking off because of eczema?	76 (18.9%)	74 (18.4%)	106 (26.3%)	147 (36.5%)
17. How many days has your child's skin felt dry or rough because of eczema?	174 (43.2%)	75 (18.6%)	68 (16.9%)	86 (21.3%)

Table 3: Assessment of TOPICOP score.

Question	Totally agree	Almost agree	Do not agree	Totally disagree
18. Do you think TCS can pass into a child's bloodstream?	76 (18.9%)	186 (46.2%)	95 (23.6%)	46 (11.4%)
19. TCS can lead to infections	28 (6.9%)	106 (26.3%)	178 (44.2%)	91 (22.6%)
20. TCS can increase your child's weight	57 (14.1%)	131 (32.5%)	141 (35%)	74 (18.4%)
21. TCS can damage child's skin	81 (20.1%)	170 (42.2%)	120 (29.8%)	32 (7.9%)
22. TCS will affect my child future health	77 (19.1%)	172 (42.7%)	109 (27%)	45 (11.2%)
23. TCS can lead to asthma	28 (6.9%)	97 (24.1%)	205 (50.9%)	73 (18.1%)
24. I am afraid of putting cream (TCS) on child's skin at certain zones like the eyelids where the skin is thinner	252 (62.5%)	116 (28.8%)	25 (6.2%)	10 (2.5%)
25. Do not know of any side effects but I am still afraid of TCS	150 (37.2%)	165 (40.9%)	67 (16.6%)	21 (5.2%)
26. I am afraid of applying too much cream on my child shin(TCS)	193 (47.9%)	144 (35.7%)	52 (12.9%)	14 (3.5%)
27. The idea of taking TCS burdens me	149 (37%)	155 (38.5%)	75 (18.6%)	24 (6%)
28. I wait if I can before treating my child with TCS	128 (31.8%)	167 (41.4%)	85 (21.1%)	23 (5.7%)
29. I stop treatment for my child as soon as I can	166 (41.2%)	148 (36.7%)	73 (18.1%)	16 (4%)
30. I need reassurance about TCS to use it for my child	220 (54.6%)	124 (30.8%)	47 (11.7%)	12 (3%)
31. TCS can be addictive	82 (20.3%)	131 (32.5%)	118 (29.3%)	72 (17.9%)
32. I prefer use TCMS/ herbal medications before using TCS	75 (18.6%)	110 (27.3%)	119 (29.5%)	99 (24.6%)
33. I would rather use something that does not contain steroids even if it is more	187 (46.4%)	123 (30.5%)	58 (14.4%)	35 (8.7%)

expensive				
If you used TCS before for your child, please answer the following Questions: (n=348)				
34. My child benefited from TCS use	144 (41.4%)	157 (45.1%)	27 (7.8%)	20 (5.7%)
35. My child experienced side effects from TCS use	27 (7.8%)	88 (25.3%)	156 (44.8%)	77 (22.1%)

Table 4: Source of information regarding TCS and level of trust in these sources

36. Where do you get information on TCS/steroid cream?				
	Never	Sometimes	Often	Always
Dermatologists	41 (10.2%)	105 (26.1%)	111 (27.5%)	146 (36.2%)
Other doctors	94 (23.3%)	164 (40.7%)	77 (19.1%)	68 (16.9%)
Friends and family	106 (26.3%)	192 (47.6%)	72 (17.9%)	33 (8.2%)
Internet and the media	98 (24.3%)	159 (39.5%)	76 (18.9%)	70 (17.4%)
37. How much do you trust the following sources for information on TCS?				
	Always distrust	Sometimes distrust	Sometime trust	Always trust
Dermatologists	8 (2%)	44 (10.9%)	106 (26.3%)	245 (60.8%)
Other doctors	26 (6.5%)	65 (16.1%)	205 (50.9%)	107 (26.6%)
Friends and family	55 (13.6%)	116 (28.8%)	209 (51.9%)	23 (5.7%)
Internet and the media	88 (21.8%)	108 (26.8%)	180 (44.7%)	27 (6.7%)

Table 5: Factors that affected TOPICOP score.

Variable	Categories	Global TOPICOP Score		P-value
		Mean	SD	
Age of the father (Years)	< 30	60.9	15.29	0.604
	30-45	62.0	16.36	
	46-55	64.0	16.31	
	56-70	59.3	18.13	
	> 70	67.2	20.17	
	Not involved	60.3	22.86	
Age of the mother (Years)	< 30	60.4	17.71	0.272
	30-45	63.6	15.50	
	46-55	60.9	16.56	
	56-70	57.9	21.70	
	> 70	69.8	17.41	
	Not involved	63.9	-	
Age of the child (Years)	Infant (< 1)	64.9	13.93	0.107
	2-5	60.8	17.36	
	5-12	60.1	17.77	
	> 12	64.4	16.08	
	Not involved	63.9	-	
Social status of the parents	Married	62.5	16.10	0.003
	Widow	48.2	26.52	
	Divorced	69.2	15.39	
Number of family members	2-4	62.8	16.34	0.719
	5-7	61.1	16.57	
	8-10	63.5	18.49	
	> 11	61.1	18.55	
	Not involved	63.9	-	
Father's educational level	Uneducated	62.5	23.30	0.077
	Primary	55.6	22.30	
	Intermediate	63.8	14.84	
	Secondary	63.8	16.28	
	Diploma	70.3	13.56	
	Bachelor's degree	61.3	16.04	
	More than a bachelor's degree	59.3	18.36	
Mother's educational level	Uneducated	59.7	23.05	0.139
	Primary	58.3	15.50	
	Intermediate	58.3	15.79	
	Secondary	63.5	19.47	
	Diploma	70.1	16.71	
	Bachelor's degree	62.4	15.28	
	More than a bachelor's degree	55.7	14.89	
Father's job	Employee	62.1	16.30	0.987
	Not employee	62.2	19.77	
Mother's job	Employee	62.3	17.07	0.882
	Not employee	62.1	16.54	
Residence of the child and the parent	Apartment	62.5	16.32	0.737
	Villa	61.5	16.39	
	Slum house	63.1	18.09	

**Factors that affected TOPICOP score:** There was no statistically significant difference between the age groups of fathers and the global TOPICOP score (P-value = 0.604). Also, the mother's age and child's age have no effect on the global TOPICOP score (P-value = 0.272, 0.107, respectively). On the contrary, the parents' marital status significantly affects TOPICOP score (P-value = 0.003); divorced have a high mean score compared to married or widows, and this could be attributed to social and emotional factors which need further studies. The number of family members was not significantly associated with the TOPICOP score (P-value = 0.719). The educational level of both fathers and mothers did not significantly affect the global TOPICOP score (P-value = 0.077, 0.139, respectively). There was no significant difference between employed and unemployed fathers or mothers regarding their TOPICOP scores (P-value = 0.987, 0.882, respectively). Also, there was no statistically significant association between the residence of the child and parents and the global TOPICOP score (P-value = 0.737).

**DISCUSSION**

Assessing population knowledge and awareness about corticosteroid use in children suffering from AD is regarded as an important issue as corticosteroids have multiple side effects. AD is considered a specific type of eczema and is the most frequent chronic inflammatory disease of the skin. It has complex etiological factors, including genetic and environmental factors, which results in defects within the epidermis through immunological mechanisms, and corticosteroids are considered one of the main treatment courses [17].

The main aim of the current study was to evaluate the parent's concerns and awareness of corticosteroid use in pediatric patients with atopic dermatitis in Al-Majmaah governorate, Saudi Arabia. Nearly 50% of participants in the current study are from the age group of 30-45 years old. Most of the participants have bachelor's degree. The vast majority of fathers were employed, and most mothers were unemployed.

About more than one-third of children reported sleep disturbance due to eczema. Less than five percent of them have their skin bleed daily due to eczema, but the majorities have no bleeding. Nearly less than one-fifth of them have skin weeping or oozing clear fluid every 2-3 days, and more than two-thirds of them have no oozing. About one-fifth have cracked skin every day. Itching frequency depends largely on the presence of irritants, including various allergens, microbes, soap, clothes, and others, as reported by the studies [18, 19].

Regarding the TOPICOP score, the mean knowledge and beliefs score was found to be 49.8±19.9; this score was similar to the score reported in the parallel study conducted by Lamberchets et al. [20]. Fears' mean was 76.6±20.9, while behavior score the mean was found to be 72.4±21.8. These scores are considered high compared to the score reported in the study conducted by

Stalder et al. with TOPICOP subscores for fears of  $54.7 \pm 27.8$  and  $50.1 \pm 29.1$  for behaviors [21].

Nearly half of them do not agree with the statement that says TCS can lead to infections, and this was found to be contradictory to the study conducted by Ashique et al. in which a considerable percentage of participants responded positively and stated that topical steroids lead to infections [22].

More than two-fifths of them almost agree TCS can damage a child's skin, but about seven percent totally disagree. More than half do not agree that TCS can lead to asthma. About two-thirds of participants totally agreed that they were afraid of putting cream (TCS) on a child's skin in certain zones like the eyelids where the skin is thinner. About two-fifths almost agreed they do not know of any side effects but were still afraid of TCS. Slightly less than half were afraid of applying too much cream (TCS) on their child's skin; these findings were found to be consistent with the findings reported in another congruent study in which participants agreed with similar statements [23].

About two-fifths almost agreed that they would wait if they could before treating their child with TCS, and a similar percentage of them also totally agreed to stop treatment for their child as soon as they could. More than half need reassurance about TCS to use it. Nearly half of the participants totally agree to use something that does not contain steroids, even if it is more expensive. More than two-fifths of those who used steroids before agreed on its beneficial effects, and the remaining participants reported side effects; these issues were also reported in the parallel study conducted by Lau et al. and described in the counseling section; all these issues should be addressed during drug prescription [24].

The source of information about TCS was the dermatologists, as reported by one-third of the participants. Nearly half of the participants got the information from other doctors. Two-fifths of participants get their information from the internet, media, and friends. Nearly two-thirds of participants always trust dermatologists regarding TCS information. Half of the participants trust other doctors sometimes, and half of the participants also trust friends, family, the internet, and media, and this was in contradiction to the study conducted by Kokandi showing most of the respondents get their information from university courses, and only a small percentage have internet and media as their primary source of information [25].

There is no statistically significant association between age groups of fathers and global TOPICOP score ( $P$ -value = 0.604). There was no significant between employed and unemployed fathers or mothers regarding their TOPICOP scores ( $P$ -value = 0.987, 0.882, respectively). No significant statistical association was found between the educational level of both fathers and mothers and the global TOPICOP score ( $P$ -value = 0.077, 0.139, respectively); similar findings were found in the study conducted by Choi et al. showing that educational level does not affect the TOPICOP score [26].

When our study was compared with the TOPICOP score reported in a study by Bos et al. regarding worries and beliefs concerning topical corticosteroids among parents of children with AD (29), involved health care professionals (31) and between different professionals (51), it was observed that the score was significantly high (39-44%). Even the TOPICOP score for mean knowledge and beliefs in our study was slightly lower than the global TOPICOP score [15].

A recent study on Danish children described the association between parental-reported healthcare utilization, medication use, and topical corticosteroid phobia and pediatric AD severity, where it was concluded that high global TOPICOP score and low parental educational level resulted in delayed treatment of AD flares, indicating improved family education ultimately may reduce healthcare expenses and burden of disease. Compared to our study, the TOPICOP score of this study was significantly higher than the global TOPICOP score. Moreover, a significant inverse linear trend between global TOPICOP score and parental

educational level was observed in the study, which complied with our study [27].

A similar cross-sectional, gender-dominated study among caretakers of children was conducted between February 2014 and May 2014 in Japan, demonstrating that the TOPICOP score was significantly higher for patients younger than 12 months old with moderate to very severe AD. It was noticed that there was no significant difference in the family history of AD, age, or gender of the respondents. Pre-attendance at an education session was the only significant factor accounting for a higher TOPICOP score. The study complied with observations related to age, gender, and family history [28]. A similar French Multicenter Cross-Sectional Study on the French population (122 children) concerning TOPICOP score on TCCs fairly complied with our study [29].

## CONCLUSION

There was a minor discrepancy between the TOPICOP score for mean knowledge and belief and the overall TOPICOP score. Nearly half of TCS participants reported skin injury due to the treatment. However, a little less than half of them are concerned about applying TCS to the skin of a kid in particular areas, such as the chin and the eyelids, where the skin is more delicate. Nearly half of the individuals said they learned about TCS through their primary care doctors, while a third said they learned about it from their dermatologist. The global TOPICOP score had no statistically significant relationship with individuals' ages, occupations, or educational levels. Marital status was shown to have a substantial impact on the TOPICOP score.

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## REFERENCES

- Williams, Hywel, et al. "Worldwide variations in the prevalence of symptoms of atopic eczema in the International Study of Asthma and Allergies in Childhood." *Journal of allergy and clinical immunology* 103.1 (1999): 125-138.
- Jean L. Bolognia, Julie V. Schaffer, Karynne O. Duncan, Christine J. Ko. *Dermatology Essentials* 2014
- Flohr, Carsten, et al. "How atopic is atopic dermatitis?." *Journal of allergy and clinical immunology* 114.1 (2004): 150-158.
- Fleischer, David M., et al. "Oral food challenges in children with a diagnosis of food allergy." *The Journal of pediatrics* 158.4 (2011): 578-583.
- Karen J. Marcante, Robert M. Kliegman, Nelson Essentials of Pediatrics, 7th edition, The Children's Hospital of Philadelphia, 2014
- Dawn A, Papoiu AD, Chan YH, Rapp SR, Rassette N, Yosipovitch G. Itch characteristics in atopic dermatitis: results of a web-based questionnaire. *Br J Dermatol.* 2009;160(3):642-644
- Meltzer, Lisa J., and Genery D. Booster. "Sleep disturbance in caregivers of children with respiratory and atopic disease." *Journal of Pediatric Psychology* 41.6 (2016): 643-650.
- Su, John C., et al. "Atopic eczema: its impact on the family and financial cost." *Archives of disease in childhood* 76.2 (1997): 159-162.
- Beattie, P. E., and M. S. Lewis-Jones. "An audit of the impact of a consultation with a paediatric dermatology team on quality of life in infants with atopic eczema and their families: further validation of the Infants' Dermatitis Quality of Life Index and Dermatitis Family Impact score." *British Journal of Dermatology* 155.6 (2006): 1249-1255
- Chamlin SL, Frieden IJ, Williams ML, Chren MM. Effects of atopic dermatitis on young American children and their families. *Pediatrics.* 2004;114(3):607-611
- Zuberbier T, Orlov SJ, Paller AS, Taieb A, Allen R, HernanzHermosa JM, et al. Patient perspectives on the management of atopic dermatitis. *J Allergy Clin Immunol* 2006;118:226- 232.
- Lee, J. Y., Her, Y., Kim, C. W., & Kim, S. S. (2015). Topical corticosteroid phobia among parents of children with atopic eczema in Korea. *Annals of dermatology*, 27(5), 499.
- Li, Y., Han, T., Li, W., Li, Y., Guo, X., & Zheng, L. (2018). Awareness of and phobias about topical corticosteroids in parents of infants with eczema in Hangzhou, China. *Pediatric dermatology*, 35(4), 463-467.
- Maya El Hachem, Francesco Gesualdo, Giampaolo Ricci, Andrea Diociaiuti, Loredana Giraldi, Orsola Ametrano, Corrado Occella, Anna Belloni Fortina, Mirella Millo, Fabio Arcangeli, Oriana Simonetti,

- Simona Giancristoforo, Elisabetta Calamelli, Carlo Mazzatenta & Iria Neri,. Topical corticosteroid phobia in parents of pediatric patients with atopic dermatitis: a multicentre survey, Italy, Italian Journal of Pediatrics volume 43, Article number: 22 (2017).
15. Bernies Bos, Ioana Antonescu, Hilda Osinga, Sietske Veenje, Kim de Jong, Tjalling W de Vries, Corticosteroid phobia (corticophobia) in parents of young children with atopic dermatitis and their health care providers, 2019, *Pediatr Dermatol.* 2019 Jan; 36(1):100-104.
  16. Manar Abdullah A. Alzahrni, Tarik Dakhilallah Alshelewy, Majdolen Magdi Hassanin, Miral Mohammed Abdulghfar, Reema Abdulaziz Alghamdi, Zaid Abdulrahman M. Alotaibi, Saud Mohammed Saud Alsafayan, Hisham Abdulaziz Alkhunaizan, Parental awareness toward atopic dermatitis in children, Saudi Arabia, *International Journal of Medicine in Developing Countries*, 2020, doi.org/10.24911/IJMDC.51-1593091842
  17. Kolb L, Ferrer-Bruker S.J. Atopic Dermatitis. [Updated 2021 Aug 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: ncbi.nlm.nih.gov/books/NBK448071/
  18. Tamagawa-Mineoka, R., & Katoh, N. (2020). Atopic Dermatitis: Identification and Management of Complicating Factors. *International journal of molecular sciences*, 21(8), 2671. doi.org/10.3390/ijms21082671
  19. Thomsen S. F. (2014). Atopic dermatitis: natural history, diagnosis, and treatment. *ISRN Allergy*, 2014, 354250. doi.org/10.1155/2014/354250
  20. Lambrechts, L., Gilissen, L., & Morren, M. A. (2019). Topical Corticosteroid Phobia Among Healthcare Professionals Using the TOPICOP Score. *Acta dermato-venereologica*, 99(11), 1004–1008. doi.org/10.2340/00015555-3220
  21. Stalder, J. F., Aubert, H., Anthoine, E., Futamura, M., Marcoux, D., Morren, M. A., Trzeciak, M., Szalai, Z., Veres, K., Deleuran, M., Vestergaard, C., Boralevi, F., Chu, C. Y., De Raeve, L., Svensson, Å., Fölster-Holst, R., Buchner, M., Takaoka, R., Aoki, V., Chernyshov, P., ... Barbarot, S. (2017). Topical corticosteroid phobia in atopic dermatitis: International feasibility study of the TOPICOP score. *Allergy*, 72(11), 1713–1719. doi.org/10.1111/all.13189
  22. Ashique, K. T., Kaliyadan, F., Mohan, S., Vijayan, S., & Chandrasekhar, D. (2018). Knowledge, Attitudes, and Behavior Regarding Topical Corticosteroids in a Sample of Pharmacy Students: A Cross-Sectional Survey. *Indian dermatology online journal*, 9(6), 432–434. doi.org/10.4103/idoj.IDOJ\_143\_18
  23. Alsukait, S. F., Alshamlan, N. M., Alhalees, Z. Z., Alsuwaidan, S. N., & Alajlan, A. M. (2017). Topical corticosteroids knowledge, attitudes, and practices of primary care physicians. *Saudi medical journal*, 38(6), 662–665. doi.org/10.15537/smj.2017.6.17586
  24. Lau, W. M., & Donyai, P. (2017). Knowledge, Attitude and Advice-Giving Behaviour of Community Pharmacists Regarding Topical Corticosteroids. *Pharmacy (Basel, Switzerland)*, 5(3), 41. https://doi.org/10.3390/pharmacy5030041
  25. Kokandi AA. Family medicine trainee's knowledge about topical corticosteroids in Jeddah Saudi Arabia. *Open dermatol J.* 2019; 13:13-8 https:// doi.org/10.2174/1874372201913010013.
  26. Choi, E., Chandran, N. S., & Tan, C. (2020). Corticosteroid phobia: a questionnaire study using TOPICOP score. *Singapore medical journal*, 61(3), 149–153. doi.org/10.11622/smedj.2019110
  27. Gerner, T., Haugaard, J.H., Vestergaard, C., Deleuran, M., Jemec, G.B., Mortz, C.G., Agner, T., Egeberg, A., Skov, L. and Thyssen, J.P., 2021. Healthcare utilization in Danish children with atopic dermatitis and parental topical corticosteroid phobia. *Pediatric Allergy and Immunology*, 32(2), 331-341.
  28. Saito-Abe, M., Futamura, M., Yamamoto-Hanada, K., Yang, L., Suzuki, K. and Ohya, Y., 2019. Topical corticosteroid phobia among caretakers of children with atopic dermatitis: A cross-sectional study using TOPICOP in Japan. *Pediatric dermatology*, 36(3), 311-316.
  29. Moawad, S., Mahé, E., Aubert-Wastiaux, H., Phan, A., Maruani, A., Chiaverini, C., Bodemer, C., Mazereeuw-Hautier, J., Lasek-Duriez, A., Droitcourt, C. and Barbarot, S., 2018. Topical corticosteroid concerns among parents of children with psoriasis versus atopic dermatitis: a French multicenter cross-sectional study. *American Journal of Clinical Dermatology*, 19(2), 261-265.