

## Original Research Article

# Knowledge of pharmacists in Saudi Arabia on the use of topical corticosteroids in atopic dermatitis

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### Abstract

**Purpose:** To investigate pharmacists' knowledge and sources of information, as well as identify future interventions concerning the use of topical corticosteroids for the treatment of atopic dermatitis.

**Methods:** This was a cross-sectional study involving a survey of pharmacists practicing in the Kingdom of Saudi Arabia from March 2022 to July 2022 using a self-structured questionnaire. Categorical responses were presented in frequency and percentages. Measurement data were presented as mean  $\pm$  standard deviation (SD), and differences were compared using Pearson chi-square.  $P < 0.05$  was considered statistically significant.

**Results:** A total of 288 pharmacists participated in the survey; out of these, 79 % of pharmacists provided incorrect answers, believing that topical corticosteroids (TCS) are used to cure eczema/dermatitis. Mean score of overall knowledge was 10.13 (2.9) while 54.9 % showed poor knowledge of TCS, and 45.1 % had adequate knowledge. Furthermore, pharmacists who were non-Saudi indigenes, senior pharmacists and those having master's degrees had significantly higher knowledge scores than others.

**Conclusion:** Knowledge of TCS for treating atopic dermatitis among pharmacists in Saudi Arabia is poor. There is a significant association of knowledge with being a non-Saudi indigene, pharmacist's rank, qualification, area of practice, and additional training. Promoting continuous education and implementing formal undergraduate training programs would address this knowledge gap and ultimately improve pharmacists' understanding of topical corticosteroid use in atopic dermatitis.

**Keywords:** Knowledge, Pharmacists, Topical corticosteroids (TCS), Dermatitis

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## INTRODUCTION

Atopic dermatitis (AD) is an itchy, chronic and relapsing inflammatory skin disease with increased incidence over the past few decades [1]. Topical corticosteroids (TCS) remain the first-line treatment and have been widely used for more than 50 years [1,2]. Also, TCS has been

proven to be effective in multiple randomized controlled trials and its effectiveness is directly linked to therapeutic adherence [3]. Poor adherence often results in treatment failure, especially with topical treatments.

Insufficient consistent information and discrepancies in treatment recommendations

between dermatologists, pediatricians, and general practitioners, as well as between physicians and pharmacists, contribute to adherence challenges [4]. The term 'corticosteroid phobia' has been used to describe the fear of this type of medication, which significantly impacts adherence and ultimately contributes to treatment failure [3,5]. Among patients and their parents who have AD, TCS phobia ranges from 38.3 % to 80.7 % [3-6]. Interestingly, healthcare professionals may also harbor doubts about TCS usage.

A study conducted in the Republic of Macedonia reported that 37.8 % of community pharmacists felt uneasy about using TCS. Similarly, 73.9 % of pediatricians, 31.7 % of general practitioners, and only 6.23 % of dermatology specialists raised concerns about TCS use [4]. Another French study in 2016 showed that pharmacists only had moderate confidence in prescribing corticosteroids [7]. Mistrust of TCS usage by pharmacists (typically the healthcare professionals constantly interacting with patients just before they receive their medications negatively) affects patients' adherence and ultimately treatment efficacy. Thus, it is highly beneficial to enhance pharmacists' knowledge about AD and TCS and foster closer communication between pharmacists and physicians. Doing so improves consistency in practice and limits doubt on TCS use [7,8]. In 2021, Saudi Arabia had a total of 30,840 pharmacists with a ratio of 9 pharmacists per 10,000 individuals, which is higher than the Eastern Mediterranean region (6.7) and the global average (6.02) [9]. Pharmacists are well placed to identify and intervene in patient non-adherence since they are often the first point of entry into the health care system, as patients with AD may approach a pharmacist first for nonprescription remedies [10].

Therefore, this study was aimed at investigating existing knowledge of TCS among pharmacists. Such data may be necessary to promote recurring continuing medical education (CME) opportunities to prioritize the safety and efficacy of dermatological treatments.

## METHODS

### Study design and setting

This was a cross-sectional study conducted between March 2022 and July 2022. A total of 288 participants practicing in a range of clinical settings in different regions of Saudi Arabia, were chosen for the study by convenient sampling. Furthermore, pharmacists involved were

informed that their involvement in the study was entirely optional, emphasizing that the study's objective was not to assess their specific institution, and assuring them that individual responses would remain confidential and inaccessible to any authority. The study was approved by the Ethical Review Committee of the Faculty of Medicine, Najran University, Najran, Saudi Arabia (approval no. 3/1/2019-2020).

### Study instrument

The study used a structured questionnaire designed to investigate the knowledge of TCS in atopic eczema. It comprised of two sections: section A was made up of 9 questions covering pharmacists' characteristics such as gender, age, nationality, pharmacy rank, qualification, number of years in pharmacy practice, area of practice, additional training on dermatology treatments and primary source of information about prescription of TCS. Section B comprised 19 knowledge questions on correct treatment of atopic eczema such as TCS indication, safety, application, and formulations.

Twelve knowledge items of the questionnaire were taken from existing pharmacist surveys [11], the remainder of the survey items were developed specifically for this survey. Responses were limited to "Correct," "Incorrect," or "I don't know," with a grading system that awarded one (1) point for a correct response and none for the latter two options. Pharmacists who scored between 0 - 10 were considered to have poor knowledge of TCS, while those who scored 11-19 were reported to have adequate TCS knowledge. The questionnaire underwent testing with three pharmacists so as to evaluate relevance and content validity.

### Data analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS, IBM Corp, Armonk, NY, USA) software version 24. To effectively measure study variables that encompassed both categorical and quantitative aspects, Categorical data were presented as frequency and percentages while measurement data were presented as mean  $\pm$  standard deviation (SD). Each participant was given a knowledge score between 0 and 19, based on the number of correct answers on TCS knowledge. Pearson's Chi-square ( $\chi^2$ ) test of independence was used to check correlations among categorical variables.  $P < 0.05$  was considered statistically significant.

## RESULTS

### Pharmacists' characteristics

The Pharmacists comprised of 233 (80.9 %) male and 55 (19.1 %) female. Most respondents were between 20 - 30 years old (46.9 %), of Saudi nationality (72.6 %), Pharmacists (68.1 %), and bachelor's degree holders (57.6 %; Table 1).

**Table 1:** Survey respondent characteristics (N = 288)

Respondent	N (%)
<b>Gender</b>	
Male	233(80.9)
Female	55(19.1)
<b>Age (years)</b>	
20-30	135(46.9)
31-40	130(45.1)
41-50	20(6.9)
51-60	3(1.0)
<b>Nationality</b>	
Saudi	209(72.6)
Non-Saudi	79(27.4)
<b>Pharmacy rank</b>	
Pharmacy technician	67(23.3)
Pharmacist	196(68.1)
Senior pharmacist	16(5.6)
Consultant pharmacist	9(3.1)
<b>Qualification</b>	
Diploma	61(21.2)
Bachelor in Pharmacy	166(57.6)
Master-level	16(5.6)
Doctor of Pharmacy	45(15.63)
<b>Years of practice</b>	
<5	138(47.9)
5–10	99(34.4)
11–15	29(10.1)
16–20	16(5.6)
>21	6(2.1)
<b>Area of practice</b>	
Private Hospital pharmacy	31(10.8)
Government Hospital	176(61.1)
Academic institution	7(2.4)
Community pharmacies	66(22.6)
Pharmaceutical industry	6(2.1)
Others	2(0.7)
<b>Additional training in dermatology treatments</b>	
Yes	74(25.7)
No	214(74.3)
<b>Primary source of information about prescription of TCS</b>	
Textbooks	137(47.6)
Pharmacy journals	19(6.6)
Clinical dermatology journals	22(7.6)
Internet-based sources	63(21.6)
Pharmaceutical representatives	10(3.5)
Pharmacy meetings	22(7.6)
Others	15(5.2)

### Knowledge about TCS

Out of the 19 questions, 11 were answered correctly by more than half of the pharmacists.

Question 2, which focuses on the anti-inflammatory and immunosuppressive effects of TCS, received the highest percentage of correct responses (74.7 %). On the other hand, question 3, which focuses on the use of TCS for curing eczema/dermatitis, had the lowest percentage of correct responses (21.2 %). Furthermore, question 14, which addresses the categorization of TCS into potency classes, received the highest number of 'I don't know' responses (30.9 %; Table 2 and Table 3).

### Association between knowledge score and Pharmacists characteristics

The survey revealed that 158 (54.9 %) of pharmacists had poor knowledge while 130 (45.1 %) had adequate knowledge of TCS. The results from this study demonstrated that older pharmacists had adequate knowledge compared to younger pharmacists. Additionally, the study revealed that senior pharmacists and individuals with a master's degree were more likely to have acquired adequate knowledge compared to their peers ( $p < 0.001$ ; Table 4 and Table 5).

## DISCUSSION

Atopic dermatitis is a common inflammatory skin condition that usually affects children. It is a chronic disease, with periods of remission and flare-ups, and this adversely affects the quality of life of patients and their families [11]. Atopic dermatitis is common in flexural areas, on the buttocks and cheeks [12]. It remains a therapeutic challenge, and topical corticosteroids continue to play an important role in management. The cause of atopic dermatitis is multi-factorial, with genetics, environment, and impaired immune response being the most predominant factors [11]. Topical corticosteroids have been the mainstay of treatment for atopic dermatitis over the past 40 years. Hydrocortisone was the first to be used, and some 30 additional corticosteroid compounds have now been licensed for the treatment of atopic dermatitis [13]. Emollient creams which are topical formulations soothe dry and irritated skin, including antihistamines which help to prevent pruritus [11]. Although pharmacists play important roles in ensuring the safe and rational use of TCS, studies on knowledge and pharmacists' counseling behavior for TCS are very lacking [14] and inadequate advice to patients potentially contributes to poor treatment outcomes [8]. This current study investigated the knowledge of pharmacists in Saudi Arabia on TCS use as well as factors associated with knowledge levels. Findings from this study would pave the way for the development of continuous

education modules to bridge this gap. Although there is currently no cure for atopic dermatitis, this study found that majority of pharmacists were unaware that there is currently no cure for atopic dermatitis. This is better than the results found in a study done by Lau and Donyai where

nearly 88.6 % opined that topical TCS is used to cure eczema [14]. In general, it is recommended to limit the use of TCS, regardless of its strength, to a period of 2-4 weeks without interruption.

**Table 2:** Knowledge about TCS in atopic eczema among pharmacists (N = 288)

Question	Pharmacists' response (N; %)			
	Answer	Yes	No	Don't know
<b>Topical corticosteroid indication</b>				
Topical corticosteroids are the first-line treatment for eczema.	Yes	196(68.1)	72(25)	20(6.9)
Topical corticosteroids have anti-inflammatory and immunosuppressive effects.	Yes	215(74.7)	54(18.8)	19(6.6)
Topical corticosteroids are used to cure eczema.	No	202(70.1)	61(21.2)	25(8.7)
All skin lesions can be alleviated by TCS.	No	92(31.9)	164(56.9)	32(11.1)
<b>Topical corticosteroid safety</b>				
TCS should only be used to treat the worst affected areas in young children.	No	127(44.1)	115(39.9)	46(16)
Children and infants, with their greater surface area to body weight ratio, can effectively absorb highly potent TCS, resulting in systemic side effects.	Yes	177(61.5)	64(22.2)	47(16.3)
Local adverse effects such as skin atrophy, hypopigmentation, striae, telangiectasia, perioral dermatitis, hypertrichosis, and acne typically only occur when potent TCS are used incorrectly over a prolonged period.	Yes	196(68.1)	64(22.2)	28(9.7)
Systemic adverse effects, such as adrenal suppression, Cushing's syndrome, and growth retardation in children, are frequently observed when patients are using TCS appropriately.	No	125(43.4)	122(42.4)	41(14.2)
<b>Topical corticosteroid application</b>				
Typically, it is recommended to utilize TCS for a period of 7 to 14 consecutive days.	Yes	175(60.8)	67(23.3)	46(16)
It is imperative to adhere to a strict regimen of applying TCS precisely twice daily.	No	126(43.8)	124(43.1)	38(13.2)
To ensure comprehensive coverage, it is important to apply a sufficient amount of TCS that can effectively cover all areas that are affected.	Yes	213(74)	53(18.4)	22(7.6)
The fingertip unit can be utilized to measure the required amount for each application.	Yes	191(66.3)	50(17.4)	47(16.3)
Incorporating regular breaks in treatment is recommended when a long-term need for TCS arises.	Yes	167(58)	58(20.1)	63(21.9)

**Table 3:** Knowledge about TCS in atopic eczema among pharmacists (continued) (N = 288)

Question	Pharmacists' response (N; %)			
	Answer	Yes	No	Don't know
<b>Topical corticosteroid formulations</b>				
5 different classes categorize the potency of TCS.	No	110(38.2)	89(30.9)	89(30.9)
The mechanism of action for TCS, androgens, and estrogens, which are all steroid hormones, is identical.	No	83(28.8)	138(47.9)	67(23.3)
The manufacturer's product packaging provides the necessary information to determine the potency of a TCS.	No	100(34.7)	124(43.1)	63(21.9)
Hydrocortisone acetate 1% cream is a super high potent TCS.	No	110(38.2)	144(50)	34(11.8)
Both mometasone furoate 0.1% cream and betamethasone 0.1% cream fall into the category of mid-potent TCS.	Yes	167(58)	82(28.5)	39(13.5)
Clobetasol propionate 0.05% cream is low potent TCS.	No	93(32.3)	140(48.6)	55(19.1)

**Table 4:** Total knowledge score and Pharmacists' characteristics (N = 288)

Variable	Total knowledge score			P-value
	Poor N (%)	Adequate N (%)	Total N (%)	
<b>Gender</b>				
Male	134(57.5)	99(42.5)	233(100)	0.063
Female	24(43.6)	31(56.4)	55(100)	
<b>Age</b>				
20-30	70(51.9)	65(48.1)	135(100)	0.358
31-40	78(60)	52(40)	130(100)	
41-50	9(45)	11(55)	20(100)	
51-60	1(33.3)	2(66.7)	3(100)	
<b>Nationality</b>				
Saudi	126(60.3)	83(39.7)	209(100)	0.003*
Non-Saudi	32(40.5)	47(59.5)	79(100)	
<b>Pharmacy rank</b>				
Pharmacy technician	48(71.6)	19(28.4)	67(100)	< 0.001*
Pharmacist	98(50)	98(50)	196(100)	
Senior pharmacist	4(25)	12(75)	16(100)	
Consultant pharmacist	8(88.9)	1(11.1)	9(100)	
<b>Qualification</b>				
Diploma	49(80.3)	12(19.7)	61(100)	< 0.001*
Bachelor in Pharmacy	86(51.8)	80(48.2)	166(100)	
Master-level	4(25)	12(75)	16(100)	
Doctor of Pharmacy	19(42.2)	26(57.8)	45(100)	
<b>Years of practice</b>				
<5	83(60.1)	55(39.9)	138(100)	0.1650
5–10	53(53.5)	46(46.5)	99(100)	
11–15	13(44.8)	16(55.2)	29(100)	
16–20	8(50)	8(50)	16(100)	
>21	1(16.7)	5(83.3)	6(100)	
<b>Area of practice</b>				
Private Hospital pharmacy	19(61.3)	12(38.7)	31(100)	0.037*
Government Hospital	102(58)	74(42)	176(100)	
Academic institution	6(85.7)	1(14.3)	7(100)	
Community pharmacies	27(40.9)	39(59.1)	66(100)	
Pharmaceutical industry	4(66.7)	2(33.3)	6(100)	
Others	0(0)	2(100)	2(100)	

\*P < 0.05

**Table 5:** Total knowledge score and Pharmacists' characteristics (continued) (N = 288)

Variable	Total knowledge score			P-value
	Poor N (%)	Adequate N (%)	Total N (%)	
<b>Additional training on dermatology treatments</b>				
Yes	48(64.9)	26(35.1)	74(100)	0.045*
No	110(51.4)	104(48.6)	214(100)	
<b>Primary source of information about prescription of TCS</b>				
Textbooks	77(56.2)	60(43.8)	137(100)	0.215
Pharmacy journals	11(57.9)	8(42.1)	19(100)	
Clinical dermatology journals	12(54.5)	10(45.5)	22(100)	
Internet-based sources	34(54)	29(46)	63(100)	
Pharmaceutical representatives	3(30)	7(70)	10(100)	
Pharmacy meetings	16(72.7)	6(27.3)	22(100)	
Others	5(33.3)	10(66.7)	15(100)	

\*P < 0.05

If lesions worsen or show no improvement, it is important to stop using the product and reassess the diagnosis. Super potent and potent preparations are recommended for a maximum of 2 weeks, followed by tapering [15] and the majority of pharmacists in this survey agreed with this recommendation. Although TCS is typically prescribed for usage twice a day, studies indicate that applying it once a day is equally effective while potentially reducing the risk of side effects [16]. In this study, the majority of the pharmacists believed that TCS should always be applied twice daily. Furthermore, males and individuals who had received additional training on dermatology treatments were more likely to provide this incorrect response. This contrasts with the result found in a Lau and Donyai study where nearly 21.9 % thought that TCS should consistently be used exactly twice a day [14].

In dermatology, prescribing medication is considered inaccurate because it is often unclear how much topical treatment should be applied, both to the patient and the prescriber [17]. Additionally, inadequate amounts of medication can result in poorly managed eczema, especially when dealing with patients who have developed widespread disease. Studies have indicated that low adherence is often linked to prescriptions with vague instructions about the amount of product to be used and the area of application [18]. Another study found that patients with dermatologic conditions only applied an average of 35 % of the expected individualized dosages [19]. The application area and dosage of TCS are optimized by providing clear Finger Tip Unit (FTU)-based instructions, leading to significant hydrocortisone absorption by the stratum corneum [20]. While some pharmacists frequently counsel patients on the amount of TCS to be applied, a third do not use the FTU for guidance [14].

In this study, 66.3 % of the pharmacists were aware that the FTU is used to measure the quantity needed for each TCS application. For optimal steroid effect, the FTU is recommended, and it is the amount of topical medication that is squeezed out from a standard tube along the tip of the adult index finger. A fingertip is defined as the distance from the end of the finger to the first crease. The recommended dosage is as follows: one FTU for covering either the hand or groin, two FTUs for the face or foot, three FTUs for an arm, six FTUs for a leg, and fourteen FTUs for the trunk [20]. It is important to use TCS correctly to ensure safety and effectiveness [3]. Studies have shown that many individuals have misconceptions about the potential side effects of TCS. For instance, local adverse effects like skin

atrophy, hypopigmentation, striae, telangiectasia, perioral dermatitis, hypertrichosis, and acne typically only occur when potent TCS are used incorrectly over a prolonged period [21]. A study by Lau and Donyai found that only 44 % of individuals recognized that these side effects are infrequent when TCS is used appropriately [14].

Majority of pharmacists were aware of these local side effects and pharmacists who were non-Saudi indigenes were more likely to give the correct answer compared to Saudi pharmacists. Systemic side effects occur with prolonged or inappropriate use of high-potency TCS, especially in children who have a higher surface area to body weight ratio, resulting in greater TCS exposure [22] and a large majority of pharmacists in this survey agreed with this statement.

Based on double-blind clinical studies and vasoconstrictor assays, TCS are categorized into seven classes, ranging from super potent agents in class 1 to very low potency agents in class 7 [23]. Decisions regarding the choice of steroids should be based on the location and extent of skin lesions, whether they are acute or chronic, patient age, and disease severity [1,2]. Furthermore, the use of a preparation that is too mild to cause a significant improvement in symptoms may lead to decreased adherence to the regimen. Pharmacists' knowledge of TCS formulation was lacking in this study with the majority demonstrating poor knowledge. Pharmacists without extra dermatology medication training or relying solely on textbook information were most likely to provide incorrect responses. Similar findings from Lau and Donyai data revealed over 60 % of pharmacists held misguided beliefs about the number of potency categories [14].

In this study, half of the pharmacists classified hydrocortisone acetate 1 % cream as a super high potent TCS, despite it being a low potent TCS. Furthermore, 51.4 % of participants were unaware that clobetasol propionate 0.05 % cream is considered a super potent cream. Interestingly, female pharmacists and those who obtained information about TCS from internet sources were more likely to provide incorrect answers. However, 58 % of pharmacists correctly identified mometasone furoate 0.1 % cream as a mid-potency TCS.

A study by Charman *et al* [5] revealed that nearly one-third of participants had difficulty in accurately classifying frequently used TCS. Another Jordanian study showed that 60 % of pharmacists recognized clobetasol as the most

potent TCS while hydrocortisone acetate, the least potent TCS, was identified by only 33 % [24]. The study found that male pharmacists were less knowledgeable compared to female pharmacists. The uneven distribution of male pharmacists (80.9 %) and female pharmacists (19.1 %) in this pilot study may have impacted the results. However, there was a significant difference in knowledge between Saudi and non-Saudi pharmacists. Also, community pharmacists were significantly more likely to get adequate knowledge of TCS compared to others. This may be attributed to patients seeking community pharmacies more often for TCS, which are typically non-prescription (over-the-counter (OTC)) drugs. Also, pharmacists who received extra dermatology training following their initial pharmacy qualification performed worse compared to those without such training. This suggests that the training provided to pharmacists may not align with their specific requirements. To overcome this knowledge gap, dermato-therapy training programs designed for pharmacists must be as comprehensive as possible.

## CONCLUSION

Knowledge of TCS in treating atopic dermatitis is poor in Saudi Arabia. Nationality, pharmacists' rank, qualification, area of practice, and additional training significantly affect knowledge scores. Promoting continuous education and implementing formal undergraduate training programs would address this knowledge gap and ultimately improve pharmacists' understanding of topical corticosteroid use in atopic dermatitis.

## DECLARATIONS

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### Ethical approval

None provided.

### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Conflict of Interest

No conflict of interest associated with this work.

## Contribution of Authors

The authors declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by them.

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