MEDICAL SCIENCE

Topical corticosteroid phobia among high educational students in Al-Madinah region: A cross-sectional study

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ABSTRACT

Background: Topical corticosteroid (TCS) phobia refers to patients' negative beliefs and ideas related to TCS use. This phenomenon is mostly caused by misinformation rather than an irrational fear, suggesting that the term TCS phobia is a misnomer. *Objectives:* To assess the prevalence of topical corticosteroid phobia among high educational students in Al-Madinah, Saudi Arabia. *Methodology:* A cross-sectional study was conducted in the 2022-2023 academic year using a pre-designed online questionnaire distributed through social media applications among university students in Al-Madinah, Saudi Arabia. The survey was composed of 13 questions. The data were analyzed by Statistical Package for Social Sciences (SPSS). *Results:* Among 485 participants, 46% of them were aged between 21-23 years old and 68% were female. Almost a quarter (22.5%) of them has used a topical corticosteroid; 22.9% of them were self-prescribed. Half of the users did not experience side effects and the most reported side effect was local skin irritation. Among non-users, fear of complications and concerns regarding its effectiveness were the most reported reasons that would prevent them from using TCS. Overall, TCS phobia and concerns were reported by 42.7% of the participants. The internet was the most common source of information. *Conclusion:* TCS are commonly used among young population in Al-Madinah. A considerable proportion was self-prescribed. TCS phobia is observed with misconceptions regarding the safety and efficacy of TCS. Health education is needed for this population to correct these misconceptions with involvement of healthcare professionals.

Keywords: Topical, Corticosteroids, Phobia, University students.

1. INTRODUCTION

Topical corticosteroids (TCS) are one of the most used medications in dermatology (Das and Panda, 2017). TCS is the mainstay of therapy in many skin problems, ranging from inflammatory diseases to autoimmune disorders, due to its anti-inflammatory effects (Choi et al., 2020). Numerous

TCS are now available in different preparations, concentrations and potencies (Das and Panda, 2017). Factors that may contribute to successful treatment and avoidance of side effects include having an accurate diagnosis, selecting the correct drug, choosing an appropriate potency, delivery vehicle, frequency of application and duration of treatment as well as proper patient profiling (Rathi and D'Souza, 2012).

TCS became available in the UK in 1987, with hydrocortisone 1% cream first being licensed for irritant contact dermatitis and reactions to insect bites. It was introduced as an over-the-counter medication without the need for a prescription (Hengge et al., 2006). Then, with widespread and unlimited misuse of the drug, especially by non-dermatologists, concerns were raised regarding side effects such as atrophy, acne, striae, telangiectasia, hypo or hyperpigmentation, angular stomatitis, hypertrichosis and other systemic side effects. What was formerly thought to be a cure-all for most dermatological diseases has turned out to be the source of many diseases. However, once it became a prescription-only medicine, the side-effects of it became less noticeable (Hengge et al., 2006).

TCS phobia refers to patients' negative beliefs, ideas and feelings related to TCS use (Li et al., 2017). This phenomenon is more likely to have been caused by misinformation rather than an irrational fear, suggesting that the term TCS phobia is a misnomer (Hon et al., 2015; Gustavsen and Gjersvik, 2016). A systematic review found that nonadherence was more prevalent among patients who had TCS phobia than in patients without it (Li et al., 2017).

Personal experiences with previous adverse effects and misinformation or misunderstanding from the media or healthcare practitioners are all possible causes of corticosteroid phobia among patients (Lambrechts et al., 2019). Identifying the specific elements and reasons for these concerns among patients using TCS would aid in the development of successful health education programmes that target certain communities and reduce concerns regarding TCS (Al-Omair et al., 2019).

An online cross-sectional study conducted in Riyadh region showed that knowledge regarding TCS use, efficacy, adverse effects and possible threats is still lacking and insufficient. The western region, on the other hand, appears to be ahead of others regarding knowledge. The effectiveness of TCS for treating skin conditions is well-known, but it has its complications locally and systemically. There are some concerns about TCS negatively affecting immunity (Alotaibi et al., 2020). Another study done in Riyadh among patients with dermatological diseases showed that the fear of using TCS was widespread among the studied group, with approximately one-fifth of them reporting having no fear of using TCS (Li et al., 2017).

Rationale

Because TCS phobia can lead to non-adherence to therapy and as a result, exacerbation of the disease, it is critical to figure out what is causing people to be afraid of using TCS. Exploring this topic could aid in providing patients appropriate TCS health education, especially since this aspect was not studied in Al-Madinah.

Objectives

The study aimed to assess the prevalence of topical corticosteroid phobia among high educational students in Al-Madinah region and evaluate their knowledge and beliefs regarding TCS and their treatment behaviors.

2. METHODS

Study design and sample size

An observational analytic (cross-sectional) study was conducted in the academic year 2022/2023 between February 2022 and October 2022 by using an online questionnaire distributed on social media applications among university students in Al-Madinah, Saudi Arabia. The study used a convenience non-probability sampling method. Eligibility criteria included university and college students, 18-year-old and above who are living in Al-Madinah Region, Saudi Arabia. For sample size, the study used a convenience non-probability sampling method to achieve a total of 485 participants.

Questionnaire and data collection

A predesigned questionnaire adapted from a previous study conducted in Riyadh, Saudi Arabia was used for data collection (Al-Omair et al., 2019). The questionnaire involved 13 questions included socio-demographic information, data regarding the prevalence of topical corticosteroid phobia, beliefs and representations about TCS, behaviors toward treatment and sources of information concerning the safety and risks of using TCS.

Statistical analysis

The data was collected, analyzed and coded by Statistical Package for Social Sciences (SPSS) program. Descriptive statistics was performed for the numerical variables as mean and standard deviation and for the categorical variables as number and percent for the categorical variables. A p-value was considered statistically significant when less than 0.05.

Ethical considerations

The study was approved by Taibah University Scientific Research Ethics Committee, College of Medicine. Ethical approval was obtained on 31 January 2022 (study ID: STU-21-006). We obtained the informed consent from the participants with considering the privacy of information and confidentiality.

3. RESULTS

Participants' demographics data

A total of 485 participants were included in this study. Table 1 demonstrates the participants' socio-demographic information. Regarding the age distribution, most of the participants 223 (46%) was between 21-23 years old and the majority was female 330 (68%), with 155 (32%) males. Regarding the academic university year, about 26.2% of the participants were in the first or second academic university year, 34% of them were in the third or fourth academic university year, while about 14.4% of them were in the fifth year and about 25.4% were in the sixth academic year or above. Regarding University, most of the participants 371 (76.5%) was from Taibah University, followed by Arab Open University, Al Ghad International College and University of Prince Mugrin. Only 109 (22.5%) of the participants had used a topical steroid cream or ointment and the remaining 77.5% did not use it.

Topical corticosteroids users

For TCS users, the following seven questions were only for them demonstrated (Table 2). TCS prescription in 48.6% of users was done by a dermatologist, 22.9% were self-prescribed, 11% were prescribed by a pharmacist, 11% were by friends or relatives' advice and 5.5% of the users were prescribed by a non-dermatologist doctor. Regarding the period of using the topical steroid, about 48.6% of the users used it for less than 2 weeks, about 33% of them used it for a period between 2 weeks to 3 months, while about 8.3% of the users used it for a period between 3 months to 1 year and about 10.1% of them used it for more than 1 year. Most users (97.2%) used a topical corticosteroid for skin problems. Regarding skin conditions, 43.1% of users had atopic dermatitis and 13.8% of them had psoriasis, 4.6% of the users had alopecia areata and the remaining 38.5% of the users mentioned other skin conditions. About 64.2% of the users used TCS until skin lesions disappeared completely. Regarding if the users concern stopped them from using steroids prescribed by a doctor, about 46.8% of the users answered 'No', while 28.4% of them Answered 'Yes' and 24.8% of the users were neutral to answer this question.

Most of the participants (52.3%) did not experience any side effects while using TCS. The most experienced side effect was local skin irritation in 24.8%, followed by acne (19.3%), skin atrophy (18.3%), skin pigmentation (16.5%), striae (9.2%), hypertrichosis (5.5%), telangiectasia (3.7%) and skin infection (0.9%).

Patient behaviors concerning treatment of corticosteroids are shown (Table 3). The participants were asked to rate (8) behaviors, the first ranked behavior got about 91.4% rating, which is: 'I'm afraid of putting cream on certain zones like the eyelids and genital area, where the skin is thinner', the second behavior was: 'If my doctor prescribed topical steroid then I would apply it' with 86.8% rating and the third one was: 'I'm afraid of using the cream for too long'.

Topical corticosteroids nonusers

For the nonusers of TCS who were 77.5% (376) of participants, they were asked if they would use TCS if they were prescribed, 56.4% answered 'Yes', 35.6% answered 'No' and 8% answered 'I don't know'. For those who answered 'No', 79.9% of them indicated the reason was that they were afraid of its complications and about 16.4% of them were having concern about its effectiveness, while about 3.7% had other reasons.

Topical corticosteroid phobia

For all participants, they were asked if they worry about using TCS, 42.7% answered 'Yes' and about 17.9% of them answered 'No', while about 39.4% were neutral. Figure 1 shows how much participants are worried regarding using TCS, 30.1% of the participants were moderately worried, while 28% of the participants were neutral, 19.8% of them were a little worried, 11.5% of them were very worried and only 10.5% were not worried at all.

Beliefs and representations regarding topical corticosteroids

All the participants were asked to rate (26) statements about beliefs and representations regarding TCS as demonstrated (Table 4). The most statement that the participants agreed on was 'Topical steroid creams or ointments are effective over a short time period' with a relative weight of about 80.9% and the second rank was 'I can become resistant to topical steroid' with a relative weight of about 69.7%, the third rank was 'Topical steroid creams or ointments calm symptoms but don't treat the cause' with a relative weight of about 69.5%, while the fourth and fifth statements in ranking were: 'Topical steroid increase my well-being' and 'Topical steroid become inefficient over time' with a relative weight of about 67.6% and 67.1% respectively. While the lowest 5 statements in rank were as follow: 'Topical steroid can lead to asthma', 'Topical steroid creams or ointments treatment is complicated', 'Topical steroid creams or ointments can make psoriasis worse', 'Topical steroid creams or ointments can make eczema worse', 'Topical steroid stunt growth' and 'Topical steroid creams or ointments are more dangerous than CS in tablet form' with a relative weight between 58.5%-54.2%.

Sources of information

Internet was the source of information for the majority of participants (49.9%), followed by family and friends (35.1%), doctors and health care professionals (27.6%), personal experience (17.3%), medical books (16.1), TV (6%), magazine/newspapers (5.6%) and others (1.4%).

Table 1 Socio-demographic information

	Frequency	Percent
Age		
18-20	135	27.8
21-23	223	46.0
24-26	98	20.2
More than 26	29	6.0
Gender		
Male	155	32.0
Female	330	68.0
Academic university year		
1	46	9.5
2	81	16.7
3	77	15.9
4	88	18.1
5	70	14.4
6 and above	123	25.4
University		
Taibah University	371	76.5
Al-Rayan Colleges	9	1.9
Islamic University	6	1.2
University of Prince Mugrin	10	2.1
College of technology	4	.8
Al Ghad International College	11	2.3
Arab open University	74	15.3

Table 2 For topical corticosteroids users

	Frequency	Percent
Who prescribed topical corticosteroids for you?		
Dermatologist	53	48.6
Non-dermatologist doctor	6	5.5
Pharmacist	12	11.0

	Frequency	Percent
Friends/ relatives advice	12	11.0
Self-prescribed	25	22.9
Other	1	.9
For how long you have used topical steroid?		
< 2 weeks	53	48.6
2 weeks - 3 months	36	33.0
3 months - 1 year	9	8.3
> 1 year	11	10.1
What's the reason for using a topical steroid cream or ointment?		
Skin problem	106	97.2
Other	3	2.8
Which skin condition do you have?		
Atopic dermatitis	47	43.1
Psoriasis	15	13.8
Alopecia areata	5	4.6
Other	42	38.5
Were topical corticosteroids used until skin lesions disappeared completely?		
Yes	70	64.2
No	39	35.8
Have your concerns ever stopped you from using steroids prescribed by a doctor?		
Yes	31	28.4
No	51	46.8
Neutral	27	24.8

Table 3 Patient behaviors concerning treatment

#	Patient behaviours concerning treatment	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Relative weight	Rank
1	I'm afraid of applying too much cream or applying it multiple times a day	4 (3.7%)	11 (10.1%)	18 (16.5%)	36 (33.0%)	40 (36.7%)	77.8%	5
2	I'm afraid of using the cream for too long	2 (1.8%)	11 (10.1%)	14 (12.8%)	29 (26.6%)	53 (48.6%)	82.0%	3
3	I'm afraid of putting cream on certain zones like the eyelids and genital area, where the skin is thinner	0 (0.0%)	2 (1.8%)	13 (11.9%)	15 (13.8%)	79 (72.5%)	91.4%	1
4	If my doctor prescribed topical steroid then I would apply it	1 (0.9%)	4 (3.7%)	11 (10.1%)	34 (31.2%)	59 (54.1%)	86.8%	2
5	I wait as long as I can before treating myself	10 (9.2%)	25 (22.9%)	24 (22.0%)	27 (24.8%)	23 (21.1%)	65.1%	7
6	I stop the treatment as soon as I can	5 (4.6%)	6 (5.5%)	32 (29.4%)	28 (25.7%)	38 (34.9%)	76.1%	6
7	I am careful to rub the cream in well when I apply it	20 (18.3%)	19 (17.4%)	32 (29.4%)	16 (14.7%)	22 (20.2%)	60.2%	8
8	I need reassurance about topical	3 (2.8%)	12 (11.0%)	24 (22.0%)	22 (20.2%)	48 (44.0%)	78.3%	4

	steroid							
Average relative weight							77.21%	

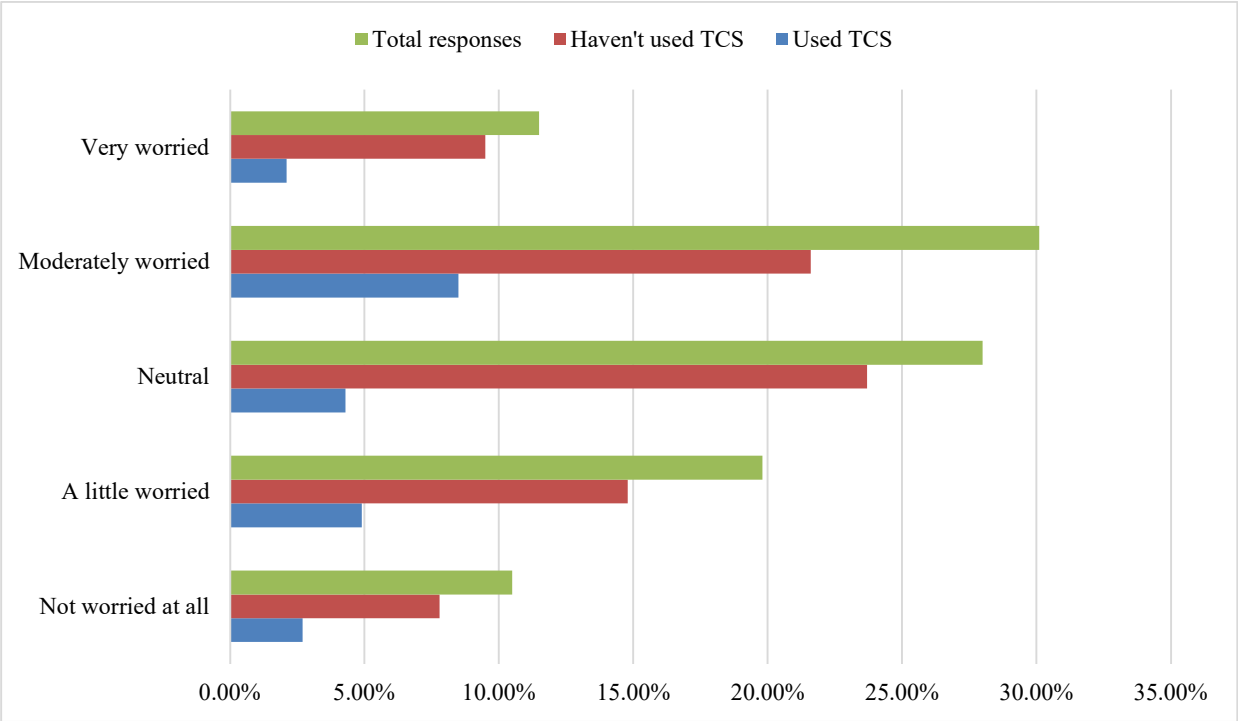

Figure 1 How much participants worry about using topical corticosteroids

TCS: Topical corticosteroids

Table 4 Beliefs and representations

#	Beliefs And Representations	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Relative Weight	Rank
1	Topical steroid creams or ointments are effective over a short time period	3 (0.6%)	21 (4.3%)	118 (24.3%)	153 (31.5%)	190 (39.2%)	80.9%	1
2	Topical steroid creams or ointments are effective over a long time period	30 (6.2%)	117 (24.1%)	184 (37.9%)	102 (21.0%)	52 (10.7%)	61.2%	13
3	Topical steroid creams or ointments pass into the bloodstream.	34 (7.0%)	109 (22.5%)	198 (40.8%)	97 (20.0%)	47 (9.7%)	60.6%	15
4	Topical steroid stunt growth	59 (12.2%)	133 (27.4%)	190 (39.2%)	66 (13.6%)	37 (7.6%)	55.4%	25
5	Topical steroid creams or ointments can lead to infections	40 (8.2%)	117 (24.1%)	180 (37.1%)	94 (19.4%)	54 (11.1%)	60.2%	17
6	Topical steroid creams or ointments make me fat	55 (11.3%)	115 (23.7%)	157 (23.7%)	73 (15.1%)	85 (17.5%)	60.7%	14
7	Topical steroid creams or ointments damage my skin	23 (4.7%)	90 (18.6%)	192 (39.6%)	120 (24.7%)	60 (12.4%)	64.3%	9
8	Topical steroid creams or ointments will affect my future health	26 (5.4%)	91 (18.8%)	176 (36.3%)	121 (24.9%)	71 (14.6%)	64.9%	8
9	There is a dependency risk	53 (10.9%)	105 (21.6%)	168 (34.6%)	61 (18.8%)	68 (14.0%)	59.4%	20
10	I can become resistant to topical steroid	19 (3.9%)	50 (10.3%)	179 (36.9%)	151 (31.1%)	86 (17.7%)	69.7%	2
11	Topical steroid become inefficient over time	13 (2.7%)	73 (15.1%)	199 (41.0%)	130 (26.8%)	70 (14.4%)	67.1%	5

12	Topical steroid creams or ointments calm symptoms but don't treat the cause	20 (4.1%)	64 (13.2%)	166 (34.2%)	135 (27.8%)	100 (20.6%)	69.5%	3
13	Topical steroid creams or ointments make vitiligo worse	27 (5.6%)	66 (13.6%)	299 (61.6%)	54 (11.1%)	39 (8.0%)	60.5%	16
14	Topical steroid can lead to asthma	48 (9.9%)	84 (17.3%)	234 (48.2%)	77 (15.9%)	42 (8.7%)	59.2%	21
15	Topical steroid creams or ointments make acne worse	36 (7.4%)	102 (21.0%)	227 (46.8%)	69 (14.2%)	51 (10.5%)	59.9%	18
16	Topical steroid creams or ointments can make eczema worse	58 (12.0%)	105 (21.6%)	219 (45.2%)	63 (13.0%)	40 (8.2%)	56.8%	24
17	Topical steroid creams or ointments can make psoriasis worse	44 (9.1%)	97 (20.0%)	258 (53.2%)	53 (10.9%)	33 (6.8%)	57.3%	23
18	Topical steroid creams or ointments can lead to napkin rash	35 (7.2%)	90 (18.6%)	259 (53.4%)	55 (11.3%)	46 (9.5%)	59.5%	19
19	I don't know of any side-effects but I'm still afraid of topical steroid creams or ointments	37 (7.6%)	106 (21.9%)	158 (32.6%)	113 (23.3%)	71 (14.6%)	63.1%	11
20	Topical steroid creams or ointments are more dangerous than CS in tablet form	80 (16.5%)	113 (23.3%)	194 (40.0%)	64 (13.2%)	34 (7.0%)	54.2%	26
21	Topical steroid creams or ointments treatment takes time and effort	26 (5.4%)	85 (17.5%)	213 (43.9%)	106 (21.9%)	55 (11.3%)	63.3%	10
22	Topical steroid creams or ointments treatment is complicated	58 (12.0%)	113 (23.3%)	177 (36.5%)	81 (16.7%)	56 (11.5%)	58.5%	22
23	Topical steroid treatment helps me improve my quality of life	22 (4.5%)	51 (10.5%)	229 (47.2%)	129 (26.6%)	54 (11.1%)	65.9%	6
24	Topical steroids increase my well-being	13 (2.7%)	61 (12.6%)	198 (40.8%)	154 (31.8%)	59 (12.2%)	67.6%	4
25	The advantages of topical steroid use outweigh the disadvantages	27 (5.6%)	57 (11.8%)	217 (44.7%)	124 (25.6%)	60 (12.4%)	65.5%	7
26	Topical steroid can decrease the immunity	28 (5.8%)	81 (16.7%)	232 (47.8%)	89 (18.4%)	55 (11.3%)	62.6%	12

4. DISCUSSION

TCS are widely prescribed to treat many skin disorders by primary healthcare physicians and dermatologists (Alsukait et al., 2017). The widespread availability of TCS and misuse of it as an over the counter and prescription by non-dermatologists lead to a rise of side effects, thus, it became available only by prescription, which reduced the side effects (Hengge et al., 2006). The general population is becoming more aware of TCS side effects because of mass media, family and friends, healthcare practitioners and social media, leading to what is called 'TCS phobia' (Raffin et al., 2016). TCS phobia can lead to poor adherence in patients prescribed topical steroids for skin conditions, which negatively affects their management (Raffin et al., 2016). TCS phobia is a prevalent issue worldwide (Li et al., 2017). Therefore, there is a need to explore the magnitude and reasons for TCS phobia on a local level among the young Saudi population in Al-Madinah to provide proper health education among the population.

In this study, among university students in Al-Madinah region, only 22.5% had used TCS. Among the TCS users, prescriptions were given by a dermatologist in 48.6% of participants, followed by self-prescription in 22.9% and by pharmacists in 11%. Self-prescription of TCS was also reported in a Saudi study (43.1%), particularly among females (Kojima et al., 2013). A study done among Saudi females revealed that 71.8% of the sample had used self-prescribed TCS for various skin problems; the leading cause was for acne (Al-Aojan et al., 2021). Thus, self-prescription and misuse of TCS is considered a problem in Saudi Arabia. In the present study, the causes of TCS were mostly skin conditions: 43.1% of the users had atopic dermatitis, 13.8% of them had psoriasis, 4.6% of the users had alopecia areata and the remaining 38.5% had other skin conditions. Almost half of TCS users in the present

study reported using of preparations for less than two weeks. Over a third of them stopped using TCS before disappearance of the skin lesion completely and 28.4% mentioned that their concerns led them to stop using TCS prescribed by a doctor. Moreover, most of them agreed that TCS are effective over a short time period. Therefore, physicians need to educate their patients to continue steroid use for several extra days after the disappearance of the skin lesion to maintain the therapeutic effect, as incomplete treatment could worsen the situation or predispose to other complications (Al-Aojan et al., 2021).

Behaviors regarding treatment and side effects were evaluated in this study. 52.3% of the users did not experience any side effects while using TCS and the most experienced side effect was local skin irritation. Most of them were concerned about using it on thinner skin like the eyelids and genital area. Also, they were concerned about using it for too long.

In the current study, the internet was the main source of information concerning the safety and risks of TCS, followed by family, friends and relatives whereas doctors or health-care professionals ranked third. In other Saudi studies done by Alotaibi et al., (2020) and Alghamdi et al., (2021), social media was the main source of information about TCS. This is not in accordance with Alafnan et al., (2019), who found that approximately 30% of women had information about TCS from their doctors. In our community, doctors should educate their patients and the community in a more proactive manner regarding the safety and efficacy of TCS.

For nonusers, 35.6% answered that they would not use TCS if they were prescribed, the major cause was being afraid of complications (79.9%), followed by concerns about its effectiveness (16.4%). In another study regarding steroid phobia, the fear of side effects was a major cause of this phobia (Contento et al., 2021). Therefore, concerns regarding TCS phobia should be considered by the prescribing physician to ensure that patients are receiving the best of care.

Regarding TCS phobia among all participants (485), 42.7% were worried about using TCS, while about 39.4% were neutral and 17.9% of them were not worried. This coincides with the results of a recent review that mentioned that the prevalence of TCS phobia ranged between 31 and 95.7% in patients, caregivers and healthcare providers for all skin lesions (Contento et al., 2021).

Regarding participants' beliefs and representations about TCS, the statements that the participants most agreed on were that TCS or ointments are effective over a short period but resistance can develop over time and that it can calm symptoms but does not treat the cause. On the other hand, a smaller proportion of them agreed that TCS can lead to asthma, can make psoriasis and eczema worse, can stunt growth, are complicated to use and are more dangerous than CS in tablet form. The internet was the source of information for most participants (49.9%), followed by family and friends (35.1%) and doctors and health care professionals (27.6%). Beliefs and misconceptions were partially attributed to the media that exaggerate the TCS side effects, leading to TCS phobia in patients (Li et al., 2018).

Healthcare workers (physicians and nurses) should play a vital role in educating patients about topical corticosteroid treatment for various skin lesions regarding safety, efficacy and appropriate use (Grillo et al., 2006). A short-term education program to educate patients had positive long-term effects on skin lesion severity and patient's phobia about TCS usage (Futamura et al., 2013).

The strengths of the present study include its conduction among university students who commonly use these preparations and using a previously validated questionnaire for data collection. However, including only students from one region might impact the generalizability of the results. Also, applying a convenience non-probability sampling technique to select the sample is subject to bias. Despite these limitations, this study has public health importance in exploring this important issue among our young population.

5. CONCLUSION

TCS are commonly used among the young population in Al-Madinah. A considerable proportion was self-prescribed. TCS phobia was observed, with misconceptions and fear regarding the safety and efficacy of TCS. The internet was the main source of information, with a lower share of healthcare professionals. Based on the main results of the present study, health education programmes are needed for this population to correct misconceptions with more active involvement of healthcare professionals.

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Author's contribution

Mosab Tariq Mohanna: Study proposal
Rawabi Ahmed Albeladi: Study questionnaire
Esraa Khalaf Alshareef: Introduction

Showq Abdullah Alsaedi: Methodology
Afnan Fadhel Aljawi: Results
Ahmed Adnan Ozbuk: Statistical analysis and Conclusion
All authors wrote the first and final draft of the study abstract and discussion sections. Also, they have critically reviewed and approved the final draft of the study and are responsible for the content and similarity index of the manuscript.

Ethical approval
The study was approved by Taibah University Scientific Research Ethics Committee, College of Medicine (study ID: STU-21-006).

Informed consent
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Conflict of interest
The authors declare that there is no conflict of interests.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

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