Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/bw3efb58

KNOWLEDGE AND AWARENESS ABOUT ADVERSE EFFECTS OF TOPICAL STEROIDS AMONG THE MEDICAL UNDERGRADUATE STUDENTS

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Abstract:

Background: Topical steroids (TSs) are commonly prescribed in dermatology for their anti-inflammatory and immunosuppressive effects. However, their misuse—especially for cosmetic purposes—can lead to significant adverse effects. In India, the over-the-counter (OTC) availability of TSs has contributed to rising concerns of inappropriate use. This study aims to assess the knowledge and awareness of TS indications and adverse effects among undergraduate medical students.

Methods: A cross-sectional study was conducted among 2nd, 3rd and 4th-year medical undergraduates at Hassan Institute of Medical Sciences. A structured online questionnaire assessed knowledge of TS indications, dosing and awareness of misuse-related complications. Data were analyzed using descriptive statistics.

Results: Of 451 students approached, 392 responded (86.9%). Peer-reviewed sources (66.83%) were the most cited source of information. Adequate knowledge of TS indications was found in 66.33% of students and 77.04% were aware of potential adverse effects. Importantly, 94.13% did not support the use of TSs for skin lightening.

Conclusion: The study revealed a generally high level of awareness among medical undergraduates regarding appropriate TS use and risks. However, gaps in practical knowledge and continued reliance on non-peer-reviewed sources highlight the need for targeted educational interventions, including cosmeto-vigilance training in medical curricula.

Keywords: *Topical steroids, Steroid Abuse, Skin lightening, Adverse drug effects*

Introduction:
Topical steroid (TS), a synthetic form of biological corticosteroid, which is used in many skin related conditions to minimize localized inflammatory symptoms as a primary choice of treatment.[1] Clinical effects are mainly due to their strong anti-inflammatory, vasoconstrictive, anti-proliferative and immuno-suppressive properties. Although safe when used appropriately, local and systemic side effects are the results of misuse and abuse of TSs.

In various parts of the world due to misuse owing to the high availability of over-the-counter (OTC) TSs serious adverse effects have been reported.[2]. Topical corticosteroids when applied over the face produce peculiar adverse effects like rosacea, itching, acne-form eruptions, telangiectasia, dyspigmentation, hypertrichosis, tinea incognito and epidermal atrophy.[3]

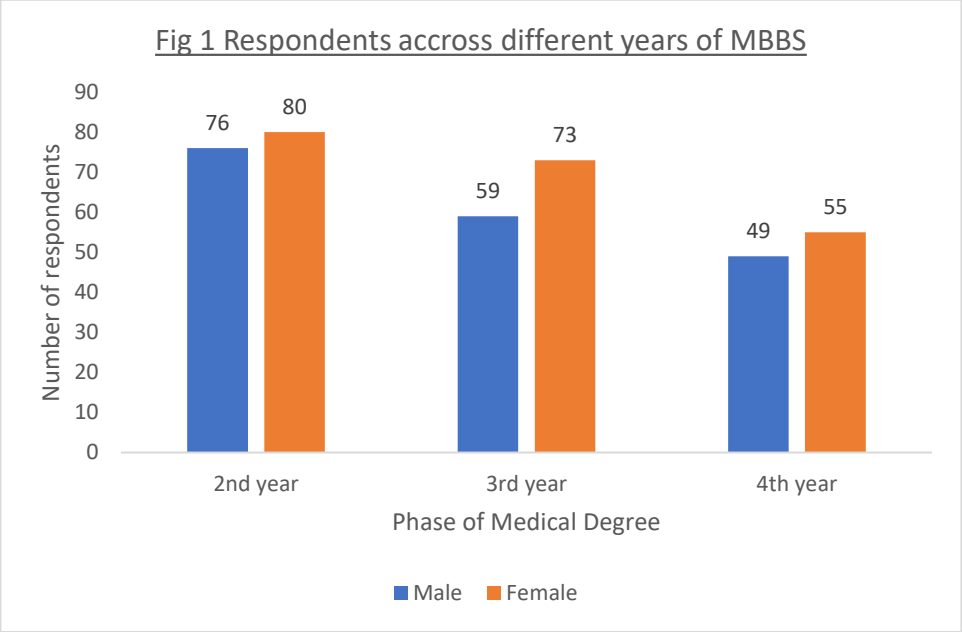
Apart from the well-known indications such as psoriasis, atopic dermatitis, vitiligo, lichen planus, lichen simplex chronicus and discoid lupus erythematosus, TS are commonly misused to lighten the skintone and other skin conditions by general population and healthcare personnels without proper consultation by dermatologists topical steroids are being used for conditions such as acne, melasma, urticaria and undiagnosed skin rash by the general practitioners.[4] TS are known to cause skin thinning and lightening as a side effect. Due to their easy availability over the counter at a low price, misuse has been noted in higher rates. In spite of being a common problem, only few studies have investigated the misuse of topical corticosteroid products in India.

Aim and Objective:
1) To Evaluate the Knowledge of indications of Topical Steroids among the medical undergraduate students.
2) To Evaluate the Awareness of adverse effects of Topical Steroids among the medical undergraduate students.

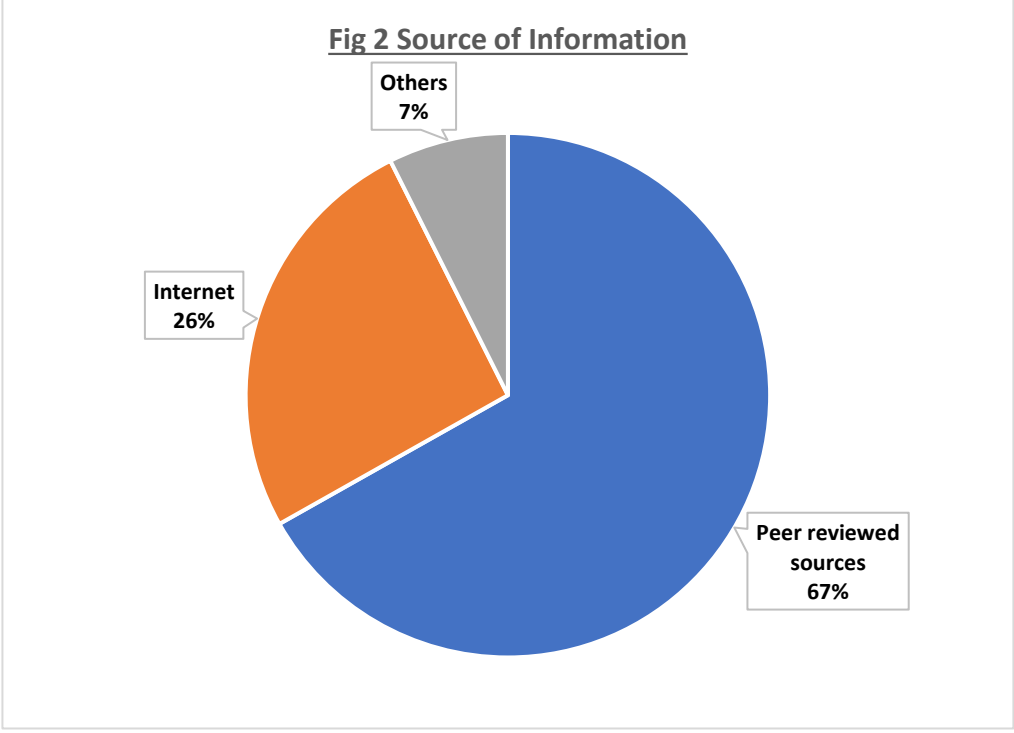
Materials and Methodology:
This is a prospective cross-sectional study was conducted at Hassan Institute of Medical Sciences, Hassan (HIMS). Ethical Clearence was obtained from the institutional ethics committee of HIMS and the research was conducted in accordance with the principles of the Declaration of Helsinki (2013) and the Good Clinical Practice (GCP) guidelines. The study methodology and reporting adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist to ensure transparency, reproducibility and methodological rigor.

We assessed the Knowledge and Awareness about indication and adverse effects of TS via an online survey created by Google Forms which was circulated among the 2nd year, 3rd year and 4th year medical undergraduates. A self-administered questionnaire containing three parts was distributed, part-1 consists of demographic data, part-2 consisted of questions to assess knowledge (available preparations and their indications, recommended duration and dosing), Awareness about adverse effects and complications of TSs. The collected data was tabulated in Microsoft Excel and analyzed using descriptive statistics. Categorical data presented as percentage and proportions.

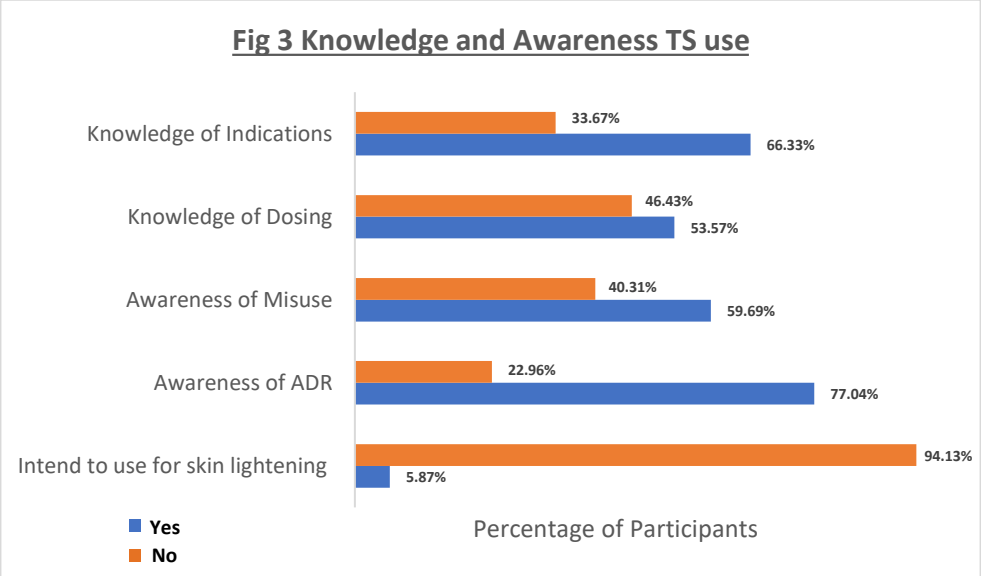
Results
In our study, the questionnaire was administered to 451 students out of the 392 responded. Among them 184 (46.93%) were male and 208 (53.07%) were female aged between 18-24 years studying phase 2 and phase 3 medical undergraduate degree. (Fig 1)



Textbook and journals (peer reviewed sources) were the most common source of information 262 (66.83%), followed by Internet 101 (25.76%) and others such as Friends/Relatives, Pharmacist, General Practitioners was 29 (7.41%). Heavy reliance on non-peer-reviewed sources suggests a potential for misinformation. (Fig 2)



Among the participants 260 (66.33%) of them had adequate knowledge about Indications of topical steroids, 208 (53.57%) were aware about the recommended dosing, 232 (59.69%) were aware that topical steroids can be misused for the purpose of skin lightening, 301(77.04%) were aware of adverse effects of topical steroids and the risk of complications associated with misuse of TSs. 369 (94.13%) of the participants were did not intend to use TSs for the purpose of skin lightening. (Fig 3)



Discussion:

This study provides valuable insight into the knowledge and awareness regarding TSs among undergraduate medical students. Of the total students approached, 86.9% responded with a nearly even gender distribution and an age range of 18–24 years, representing phase 2 and phase 3 medical students.

Our findings reveal a relatively high reliance on peer-reviewed sources, with 66.83% like textbooks and journals as their primary information source. This contrasts with other Indian studies where informal and non-peer-reviewed sources like the Internet, friends and pharmacists dominated. For example, Kumar et al.[12] and Nagesh TS et al[18] reported pharmacists and general practitioners as frequent influencers of steroid use in general populations. In our study, only 7.41% cited such sources, suggesting higher awareness among medical students compared to general population.

However, 25.76% still relied on the Internet, a double-edged sword where misinformation may spread quickly. Although our study shows relatively lower dependency on unreliable sources compared to the general population but the risk still persists.

In our study, 66.33% of participants demonstrated adequate knowledge regarding TS indications, in contrast to the observations by Ambika H et al.[11] where patients were often unaware of appropriate usage. Comparatively, our participants showed better foundational understanding, likely due to their medical curriculum exposure.

Importantly, 53.57% were aware of the recommended dosing—a modest figure given their educational background. This suggests a gap between theoretical exposure and practical knowledge, as seen in similar studies. For instance, Coondoo A et al[15] emphasized the importance of understanding not just indications but also site, potency and duration to avoid misuse.

Furthermore, 59.69% recognized that TSs are misused for skin lightening and a striking 94.13% rejected the idea of using TSs for this purpose. This is in stark contrast to studies by Rathi S[13] and Nnoruka EN[20], where TSs were widely used for depigmentation, especially in socio-cosmetic contexts. Our data suggest shifting trends among medically literate youth, who are increasingly cautious of unethical cosmetic applications.

An encouraging 77.04% of students were aware of the adverse effects and complications associated with TS misuse. These results surpass those from earlier reports where awareness was poor. For instance, Ambika et al[11] found that 100% of the patients misusing TSs on the face were unaware of side effects, leading to common complications such as acneiform eruptions, rosacea and steroid-dependent facies.

Meena S et al[17] and Sinha A et al[16] documented widespread adverse events like tinea incognito, atrophy and hyperpigmentation in populations where education on appropriate steroid use was

lacking. In contrast, our study participants, though not free of gaps, demonstrates significantly higher awareness and a more critical perspective on misuse.

The relatively high levels of awareness and ethical perspectives observed in our study group are promising, especially considering their future roles as prescribers. However, the knowledge gaps in dosing and the lingering trust in Internet sources emphasize the need for targeted curricular interventions. Integrating cosmeto-vigilance modules and case-based learning on steroid misuse could help bridge these gaps.

As Ashique KT et al[14] highlighted, clinical pharmacists can also play a key role in reinforcing proper steroid use at the point of dispensing, acting as a safeguard against misinformation and misuse in community settings. Encouraging interprofessional collaboration during training may enhance awareness and patient education in future practice.

Conclusion:

In summary, our findings indicate a generally high level of awareness about the appropriate use and risks of topical steroids among medical undergraduates. Compared to the general population and previously published reports, this group shows more informed decision-making and resistance to the cosmetic misuse of steroids. Nevertheless, curriculum enhancements focusing on practical, ethical and psychosocial aspects of dermatological pharmacology are warranted to ensure complete preparedness for clinical roles.

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