



Awareness on Topical Corticosteroids among Dental Students

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Authors' contributions

This work was carried out in collaboration between both authors. Author AM designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author DG managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

Topical corticosteroids play a major role in the treatment of many dermatologic conditions. They are FDA-approved and indicated for the use of inflammatory and pruritic presentations of dermatologic conditions. The well-known indications are for diseases such as psoriasis, limited areas of vitiligo, eczema, atopic dermatitis, phimosis, acute radiation dermatitis, lichen planus, lichen simplex chronicus, discoid lupus erythematosus, and lichen sclerosus. They are effective for conditions involving hyper-proliferation, immunological, and inflammatory properties. The aim of the study was to assess the knowledge and awareness of topical corticosteroids among the dental students. The present study was an online-based survey conducted among dental students. Questionnaires were prepared and distributed among dental students through an online portal system called google forms. About 84% of dental students were aware of topical corticosteroids. From the results of the survey, it is clear that most of the dental students were well aware of topical corticosteroids and also had proper knowledge and its complications.

Keywords: Corticosteroids; drugs; knowledge; complication; dental students.

1. INTRODUCTION

The adrenal cortex releases a group of hormones that include glucocorticoids and mineralocorticoids [1]. The glucocorticoids, which are usually referred to as corticosteroids, are one of the most widely prescribed drugs due to their profound immunomodulatory action [2]. Corticosteroids are substances that are naturally produced in our body. They are produced by the adrenal glands and regulate our immune system, water balance in our system and help to reduce inflammation [3,4]. Corticosteroids include two main classes which are glucocorticoids and mineralocorticoids. Glucocorticoids such as cortisol affect carbohydrate, fat, and protein metabolism and have anti-inflammatory, immunosuppressive, antiproliferative, and vasoconstrictive effects [5]. Mineralocorticoids such as aldosterone are primarily involved in the regulation of electrolyte and water balance by modulating ion transport in the epithelial cells of kidney's renal tubules [5].

Topical corticosteroids play a major role in the treatment of many dermatologic conditions. They are indicated for the use of inflammatory and pruritic presentations of dermatologic conditions. The well-known indications are for diseases such as psoriasis, limited areas of vitiligo, eczema, atopic dermatitis, phimosis, acute radiation dermatitis, lichen planus, lichen simplex chronicus, discoid lupus erythematosus, and lichen sclerosus [6]. They are effective for conditions involving hyper-proliferation, immunological, and inflammatory properties [7].

Topical corticosteroids have a vast number of actions such as anti-inflammatory, anti-mitotic, and immunosuppressive effects [8]. Successful administration of topical corticosteroid depends upon diagnosis, choosing the correct drug, selecting the appropriate vehicle and potency, and the frequency of application [7]. Topical corticosteroids are available in various forms such as ointment, creams, lotion, gels and foams [9]. There are 7 classes for ranging the topical corticosteroids based on potency, from high to low. The potency of topical corticosteroids is the amount of drug needed to produce a desired therapeutic effect. The gold standard for determining potency is the vasoconstrictor assay which measures the vasoconstrictive properties based upon cutaneous vasoconstriction [7].

The adverse effects of topical corticosteroids can be divided into local and systemic effects. Local

adverse effects occur with prolonged treatment and are based on the topical steroid potency, vehicle, and application site. The most common local effects include atrophy, striae, rosacea, perioral dermatitis, acne, and purpura [10]. Systemic adverse effects are less likely to occur due to low percutaneous absorption; however, they can develop with the prolonged use of high-potency steroids on thin epidermal regions. The systemic adverse effects include glaucoma, hypothalamic-pituitary axis suppression, Cushing syndrome, hypertension, and hyperglycemia [10].

Previously our department has published extensive research on various aspects of prosthetic dentistry [11–21]. This vast research experience has inspired us to implement cross-sectional surveys on the awareness of topical corticosteroid among dental students. Many vesiculobullous lesions like pemphigus and pemphigoid occurring in the oral cavity are managed by application of topical corticosteroids. Hence it is very essential for dental students to have a proper understanding of topical corticosteroids. The aim of the study was to assess the knowledge and awareness of topical corticosteroids among dental students.

2. MATERIALS AND METHODS

The present study is an online-based survey conducted among the dental students. The participants were 100 undergraduate dental students. Participation in this study was voluntary. Questionnaires were prepared and distributed among dental students through an online link from the survey planet. The questionnaire contained 10 questions. Independent variables were demographics such as year of study of participants. Dependent variables were topical corticosteroids, dental students. Only the completed surveys were included for analysis. The collected results were entered in Microsoft Excel. Data analysis was done using SPSS software 20.0. The results were expressed as percentages.

3. RESULTS AND DISCUSSION

Students from different years participated in the survey. The participants were from the first years (13.73%) second years (9.80%) third years (35.29%) fourth year (15.69%) and fifth year (25.49%) dental students (Fig. 1). About 84.31%

of students are aware of corticosteroid as medication whereas 15.69% were not aware (Fig. 2). About 84.31% of students are aware about the side effects of topical corticosteroid as medication whereas 15.69% were unaware (Fig. 3).

About 74.51% of students were aware about the types of topical corticosteroids whereas 25.49% were unaware of the types of topical corticosteroid (Fig. 4). About 60.78% of students know the available formulations of topical corticosteroids whereas 39.22% don't know the available formulations of topical corticosteroids (Fig. 5). About 72.55% of students were aware of the cross-reaction groups of topical corticosteroids whereas 25.49% were unaware about the cross-reaction groups of topical corticosteroids (Fig. 6). About 58.86% of students know the complications of topical corticosteroids usage during pregnancy whereas 39.22% don't know the complications of topical corticosteroids usage during pregnancy (Fig. 7). About 66.67% of students know the classes of topical corticosteroids whereas 33.33% don't know the classes of topical corticosteroids (Fig. 8).

About 78.43% of students know the dosage protocols of topical corticosteroids whereas 21.57% don't know the classes of topical corticosteroids (Fig. 9). About 83.39% of students responded that they will prescribe topical corticosteroids for hypertension patients whereas 16.61 % of students responded that they won't prescribe topical corticosteroids for hypertension patients (Fig. 10). About 56.86% of students were aware of the cessation protocol of topical corticosteroids whereas 43.14% of students were unaware (Fig. 11).

Topical corticosteroids are widely used for inflammatory and hyperproliferative disorders in dermatology. Numerous topical corticosteroids with high local activity have been developed over the years, with a focus to develop drugs with high efficacy locally and minimum risk for adverse drug reactions. They are available in a number of formulations. Their therapeutic effects are a result of their anti-inflammatory, immune-suppressant, vasoconstrictive and anti-proliferative actions. An appropriate topical

corticosteroid is selected on the basis of the dermatological condition to be treated, patient-related factors and the physicochemical properties of the drug. Their use is associated with mainly local adverse drug reactions, but prolonged use and/or use of high-potency topical corticosteroids may cause systemic effects [22,23].

All effective topical corticosteroids possess the potential to suppress the hypothalamic-pituitary-adrenal (HPA) axis. Factors which increase steroid penetration increase the potential for HPA suppression. In general, applications of corticosteroids to large surface areas, occlusion, and higher concentrations relate directly to increased risk of HPA suppression. Within recent years superpotent formulations, including clobetasol propionate, betamethasone dipropionate, and diflorasone diacetate, have been developed, which readily possess the ability to suppress adrenal function. Comparative quantitative studies utilized in the FDA diseased-skin protocol demonstrate that as little as 14 g/week of clobetasol propionate may induce suppression. Optimized betamethasone dipropionate is somewhat less suppressive requiring over 49 g/week to significantly reduce plasma cortisol levels [23].

In the present study, it was observed that the majority of them were aware of the adverse effects. The different types of corticosteroids available and their uses were familiar to more than an average number of the individuals. Few students were not aware that corticosteroids should be gradually stopped. Corticosteroids are commonly used in the treatment of cancer, primarily due to their anti-inflammatory and hormone regulatory functions [24]. In a prospective study, the most common side effects associated with corticosteroid use were oral candidiasis, edema, cushingoid facies, dyspepsia, and weight gain [25].

Our study was carried out with the aim of appraising the attitude and awareness of dental students toward the knowledge of topical corticosteroid. We can observe that the students were aware of topical corticosteroids and the students also had proper knowledge about the topical corticosteroids and its complications.

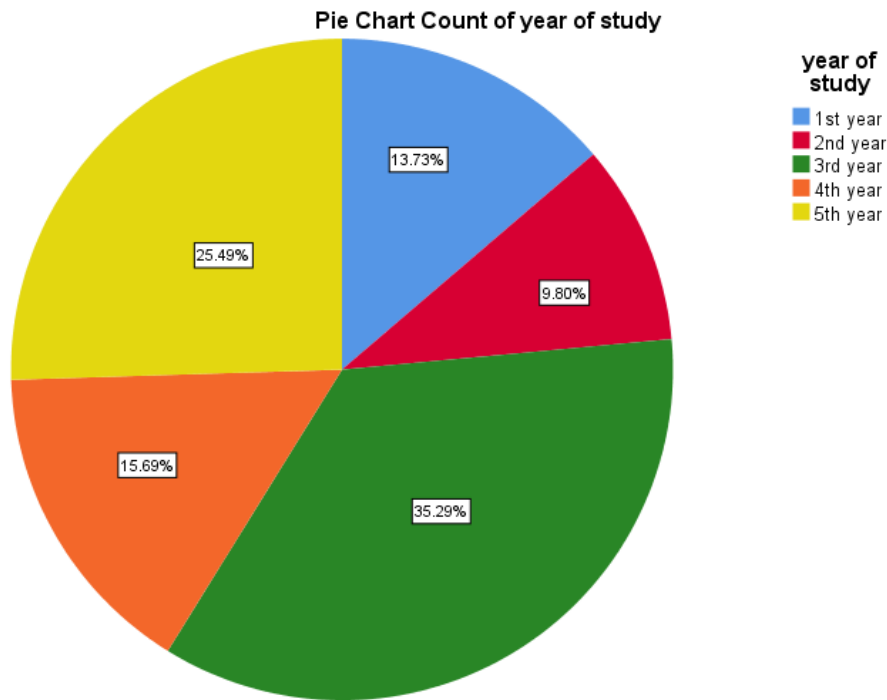


Fig. 1. Pie chart depicting the distribution of year of study of the dental students participating in the survey. Blue colour indicates 1st-year students (13.73%). Red colour indicates 2nd-year students (9.80%). Green colour indicates 3rd-year students (35.29%). Orange colour indicates 4th-year students (15.69%). Yellow colour indicates 5th-year students (25.49%)

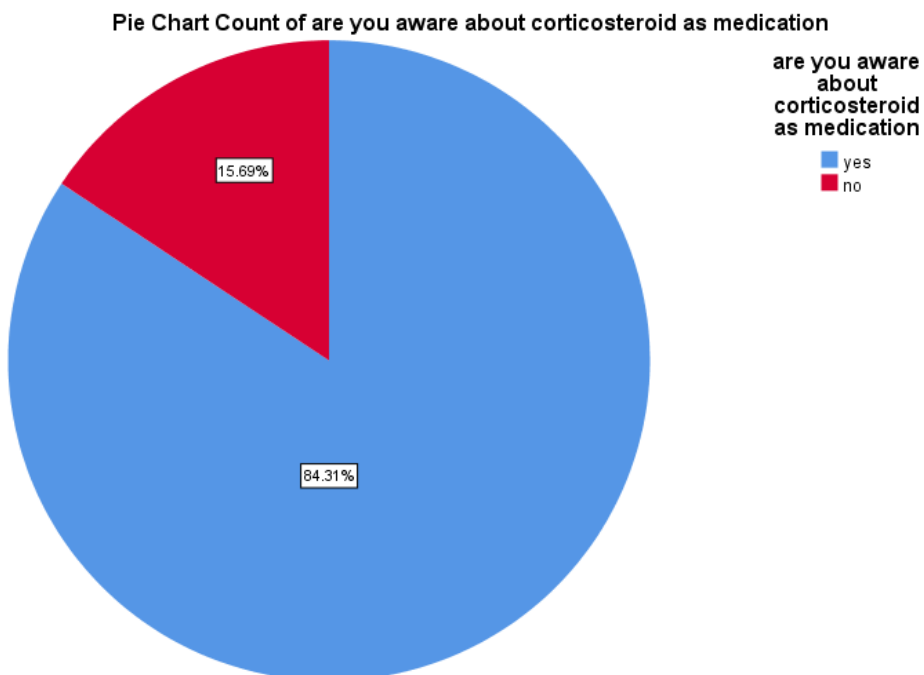


Fig. 2. Pie chart depicting the awareness of corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of corticosteroids(84.31%) Red colour indicates students who were not aware of corticosteroids (15.69%)

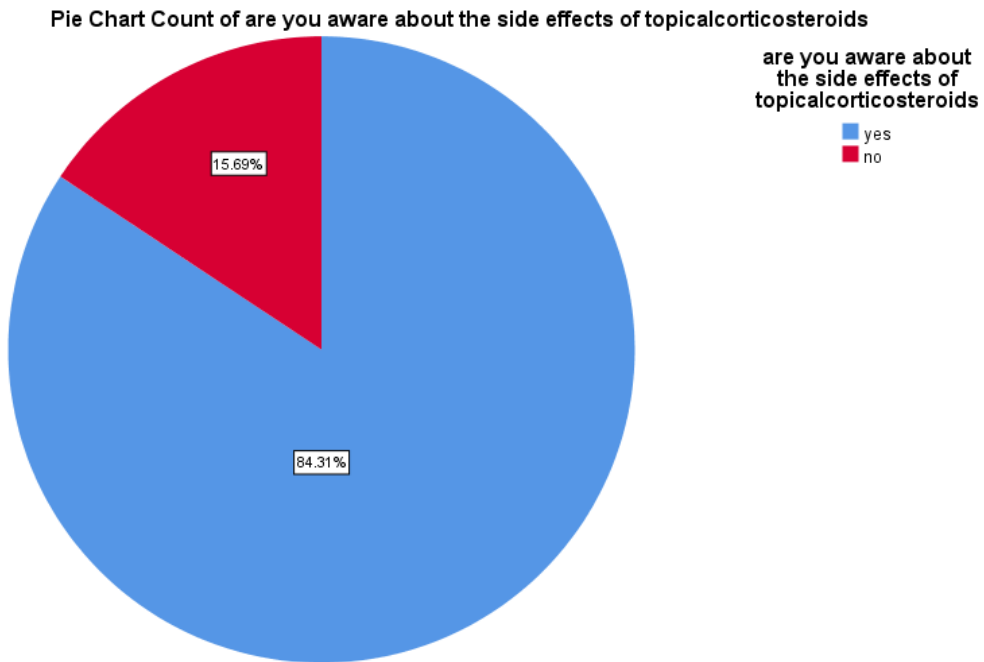


Fig. 3. Pie chart depicting the awareness of side effects of corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of side effects of corticosteroids (84.31%) Red colour indicates students who were not aware of the side effects of corticosteroids (15.69%)

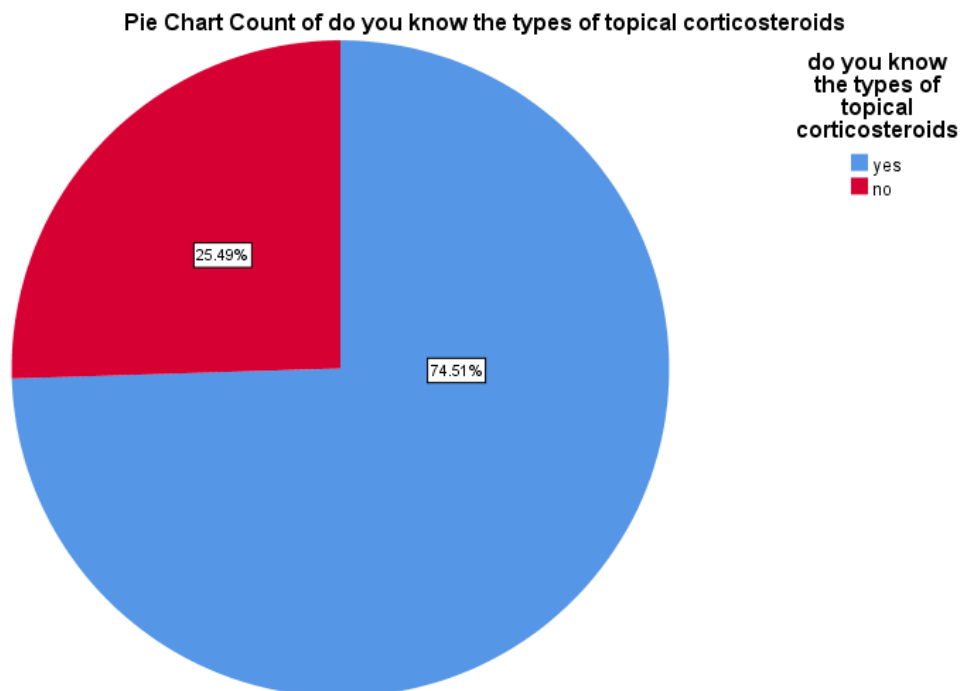


Fig. 4. Pie chart depicting the awareness of types of topical corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of types of topical corticosteroids (74.51%) Red colour indicates students who were not aware of types of topical corticosteroids (25.49%)

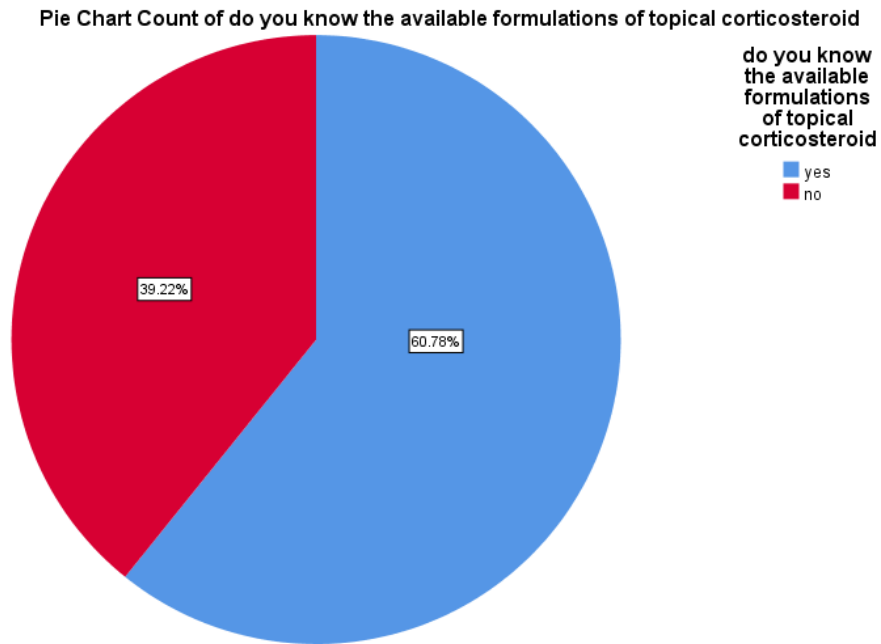


Fig. 5. Pie chart depicting the awareness of available formulations of topical corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of available formulations of topical corticosteroid (60.78%) Red colour indicates students who were not aware of available formulations of topical corticosteroid (39.22%)

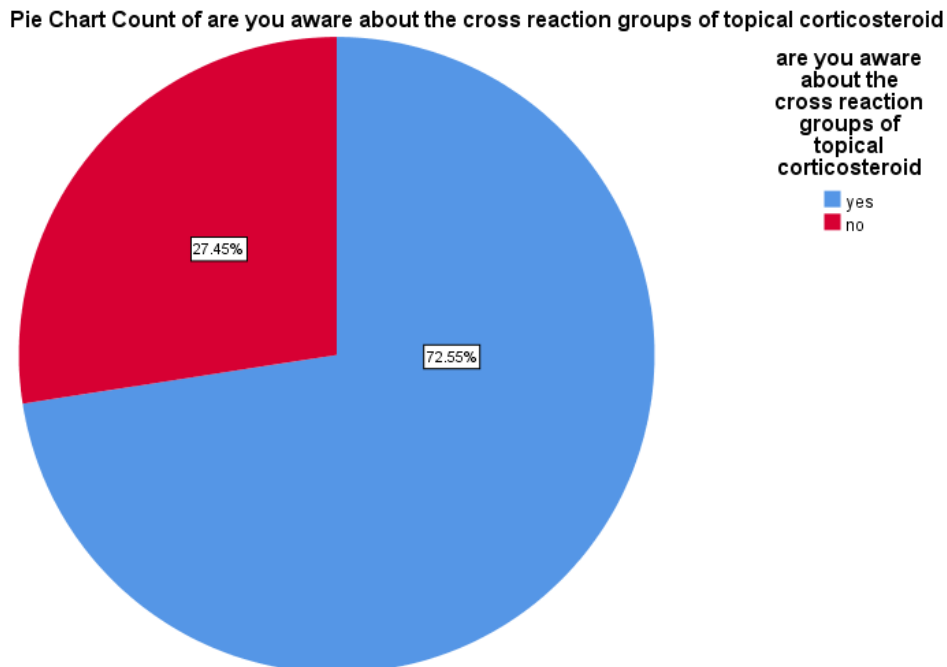


Fig. 6. Pie chart depicting the awareness about the cross-reaction groups of topical corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of the cross-reaction groups of topical corticosteroid (72.55%) Red colour indicates students who were not aware about the cross-reaction groups of topical corticosteroid (27.45%)

Pie Chart Count of do you know the complications of topical corticosteroids usage during pregnancy

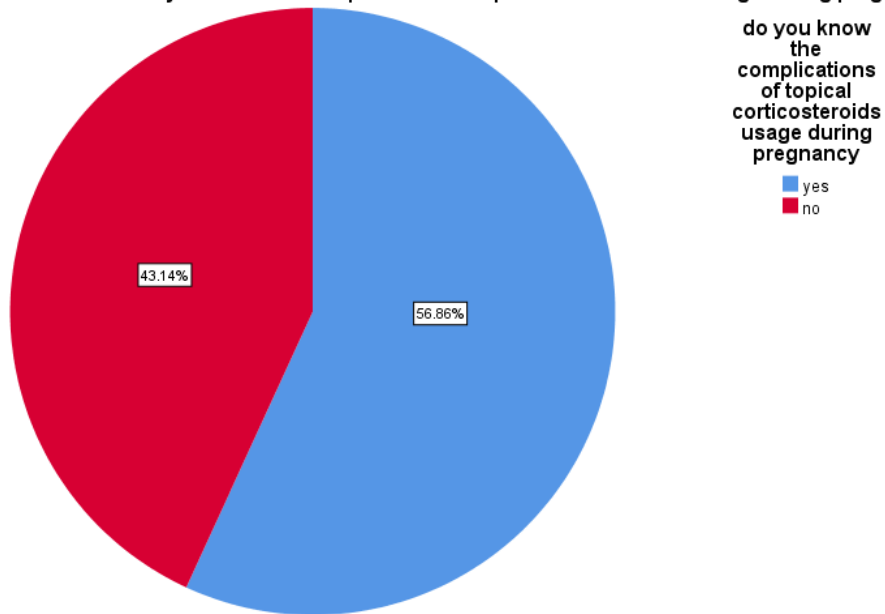


Fig. 7. Pie chart depicting the awareness of complications of topical corticosteroid usage during pregnancy among the dental students participated in the survey. Blue colour indicates students who were aware of complications of topical corticosteroid usage during pregnancy (58.86%) Red colour indicates students who were not aware of complications of topical corticosteroid usage during pregnancy (43.14%)

Pie Chart Count of do you know the classes of topical corticosteroids

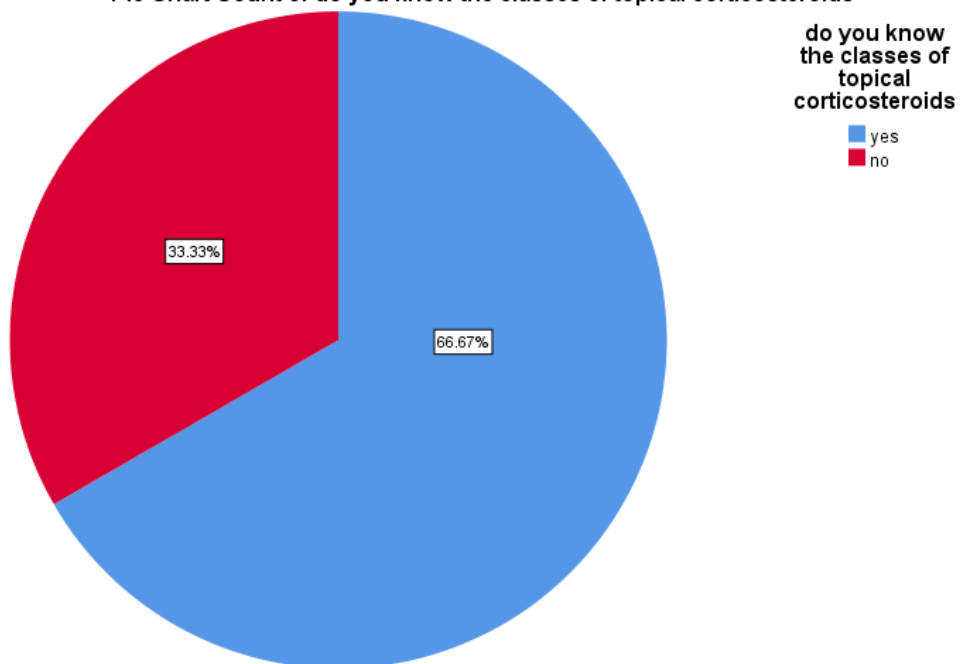


Fig. 8. Pie chart depicting the awareness of classes of topical corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of classes of topical corticosteroid (68.67%) Red colour indicates students who were not aware of classes of topical corticosteroid (33.33%)

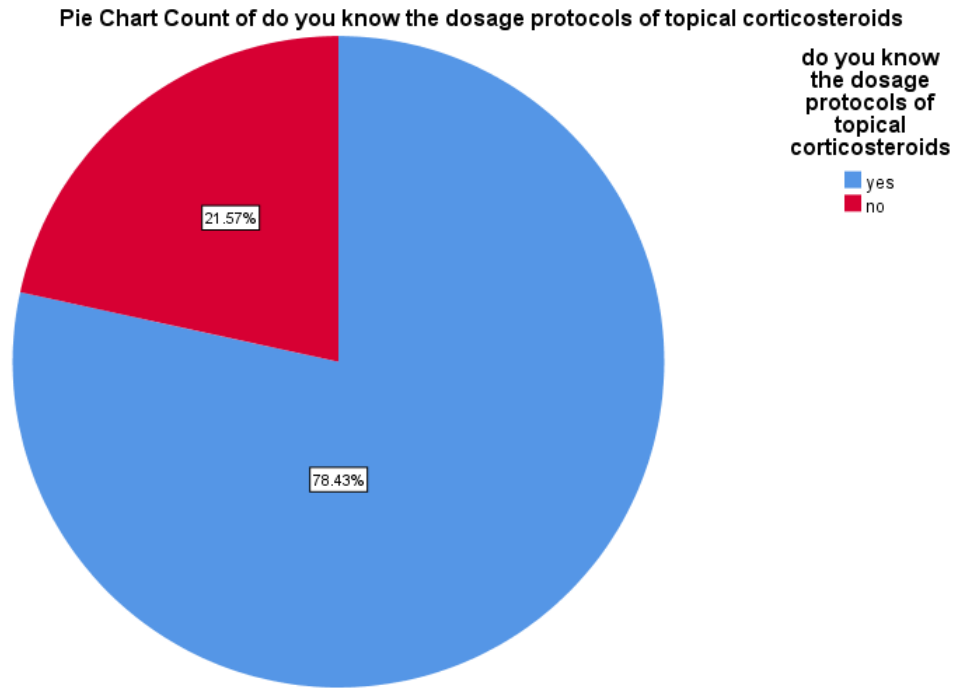


Fig. 9. Pie chart depicting the awareness on dosage protocol of topical corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of dosage protocol of topical corticosteroid (78.43%) Red colour indicates students who were not aware of dosage protocol of topical corticosteroid (21.57%)

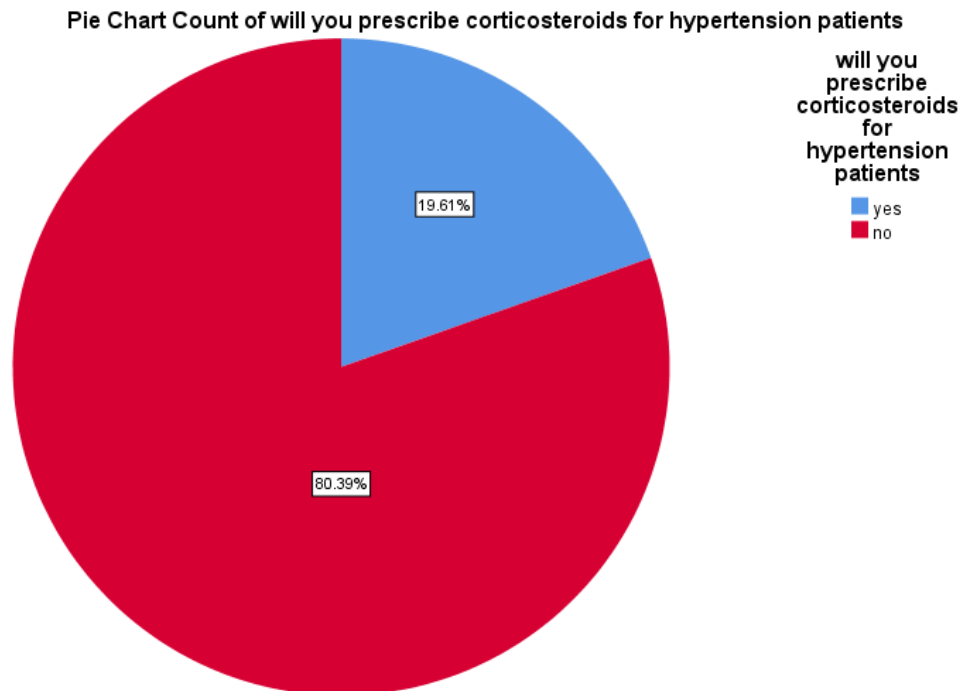


Fig. 10. Pie chart depicting the response of students whether they will prescribe corticosteroid for hypertension patients are not. About 80.39% of students responded that they won't prescribe corticosteroids for hypertension patients whereas 19.61% responded that they will prescribe corticosteroids for hypertension patients

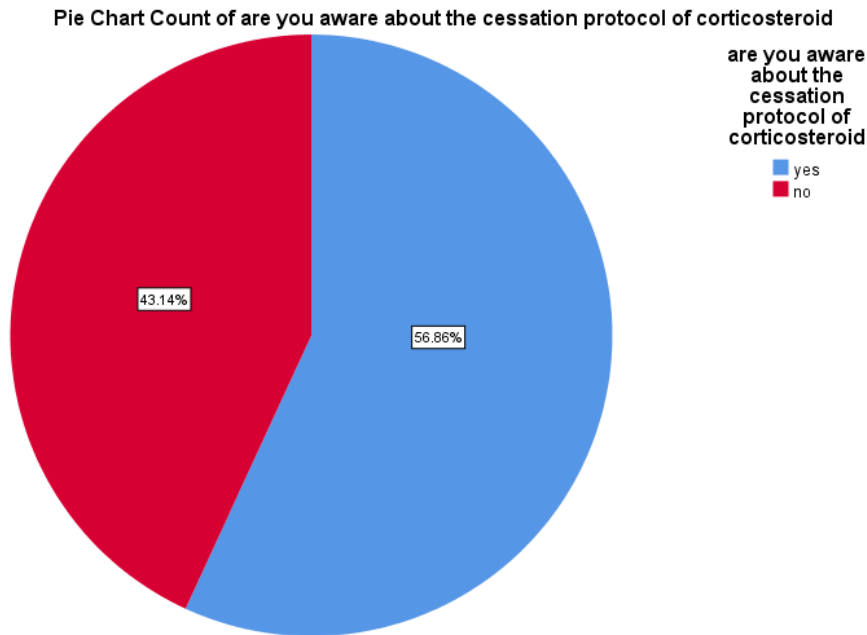


Fig. 11. Pie chart depicting the awareness about the cessation protocol of corticosteroid among the dental students participated in the survey. Blue colour indicates students who were aware of the cessation protocol of corticosteroid (58.86%) Red colour indicates students who were not aware of the cessation protocol of corticosteroid (43.14%)

4. CONCLUSION

This survey aims in creating awareness among dental students about topical corticosteroids. It also creates awareness about Complications of topical corticosteroids. From the results of the survey it is clear that most of the dental students were well aware of topical corticosteroid and also had proper knowledge about its complications.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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