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Effectiveness of power point assisted teaching regarding adverse effects of cosmetics usage among teenagers in a selected junior college, Hyderabad, Telangana

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Abstract
Cosmetics are substances used to enhance the appearance or odor of the human body. Cosmetics, toiletries, and skin-care products, including sunscreens, quite frequently cause adverse reactions, and are commonest single reason for hospital referrals with allergic contact dermatitis.

Objectives of the study:
i. To develop and validate the PowerPoint Assisted Teaching (PPAT) on Adverse Effects of Cosmetics Usage among Teenagers.
ii. To assess the level of Knowledge regarding Adverse Effects of Cosmetics Usage before and after administration of PPAT among Teenagers.
iii. To evaluate the Effectiveness of PPAT regarding Adverse Effects of Cosmetics Usage among Teenagers in terms of Post-test Knowledge scores.
iv. To find out the association between Post-test Knowledge scores regarding Adverse Effects of Cosmetics usage among Teenagers with their selected Demographic variable.

Methods: Quasi experimental research design was used. A panel of 8 experts ascertained the content validity of the tool. Reliability of tool was tested by using test retest method and the reliability of the tool was reliable. A pilot study was conducted by administering the questionnaires to 6 respondents who fulfil the sampling criteria. And Main Research study was conducted with 60 respondents who fulfil the sampling criteria.

Results: Majority 66.7% of the Teenagers were found to have above average Knowledge regarding Adverse Effects of Cosmetics Usage while 33.3% were having average Knowledge and none of them had below average Knowledge regarding Adverse Effects of Cosmetics Usage after PowerPoint Assisted Teaching. A significant association was found between the Knowledge and Demographic variable of Teenagers like Age in Years and Educational Qualification at 0.05 level of significance.

Conclusion: The study concludes that as the Knowledge regarding Adverse Effects of Cosmetics Usage among Teenagers was found to be inadequate. Hence, education programs using motivating interventions like PowerPoint Assisted Teaching was essential to create awareness on prevention of Adverse Effects of Cosmetics.

Keywords: Effectiveness, cosmetic, teenagers, adverse effect, usage

Introduction
Cosmetics are substances used to enhance the appearance or odor of the human body. They are generally mixtures of chemical compounds, some being derived from natural sources, many being synthetic. Makeup has become a necessity for most women and they believe that they can't step out of the house without using at least five different kinds of cosmetic products. The cosmetic product has bloomed to such an extent that not only is there different cosmetics for every kind of body part, there are different ones for different seasons too! An average adult uses nine cosmetic products daily. More than 25% of women use 15 or more. From a dermatologist point of interest, cosmetics may be grouped as skin-care cosmetics like cleansing agents and moisturizing agents. Hair-care cosmetics like shampoos, hair colorants and styling agents. Face-care cosmetics like facial foundations, powders, eye shadows, mascara and lipsticks. Nail-care cosmetics like nail varnishes and paint removers. Fragrance products like deodorants, aftershaves and perfumes. Ultraviolet (UV) light screening preparations.

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Cosmetics, toiletries, and skin-care products, including sunscreens, quite frequently cause adverse reactions, and are commonest single reason for hospital referrals with allergic contact dermatitis. It is estimated that 1-3% of the population are allergic to a cosmetic or cosmetic ingredient. In a survey comprising 30,000 consumers, 700 reactions occurred during 1-year period. Skin cleansing agents remain on the body for a very short period of time and rarely cause significant adverse reactions. However, perfume and others constituents may cause skin irritation and it also causes allergic reactions. The allergic reactions associated with deodorants/antiperspirants are usually caused by fragrance or other ingredients. Fragrance can enter the body through airways, skin, ingestion, and via pathways from the nose directly to the brain and can cause headaches, irritation to eyes, nose, and throat, dizziness, fatigue, forgetfulness, and other symptoms. It is the number one cause of skin allergic reactions. 15% of the general population may find fragrance a lower airway irritant and as much as 10% may have skin allergy to it. It can also cause airborne contact dermatitis.

There have been several reports of immediate allergic and anaphylactic reactions following the use of henna dyes. Most cases have sneezing, running nose, cough, and shortness of breath instead of skin reactions. Adverse effects to sun screening agents may result in irritant, allergic, phototoxic, or photo allergic reactions, and caused not only by the active constituents but also by the additives such as fragrances and stabilizers.

Need for the study
The US Food and Drug Administration (FDA) made the Centre for Food Safety and Applied Nutrition's Adverse Event Reporting System (CAERS) publicly available in late 2016 to increase transparency and encourage adverse event reporting from consumers related to cosmetics. A recent update of the database in 2017 includes adverse event reported to the FDA related to cosmetics submitted by consumers and health care providers from January 2004 to March 2017. A previous study of an earlier version of this database identified hair products, skin care products, and tattoos (nonpermanent) as the cosmetic products most often associated with adverse events like cancer. All CAERS reports for cosmetics from 2004 to March 2017 shows that many of the cosmetic products can cause "cancers like "neoplasm," "leukemia," "mass," "adenoma," "lesion," "metaplasia," "carcinoma," "malignant," and "metastatic. Products associated with cancer were then categorized into one of five broader categories: talc powders, hair products, moisturizers, cleansers, tanning products, or miscellaneous. The miscellaneous category includes nail polish, oral products, deodorants, and makeup products. These were organized by number of total reports and individual cancer types. The majority of cancer-related reports for cosmetic products were "redacted" in the database under the Freedom of Information Act exemptions.

Sunburst chart indicating product type and associated cancer. Nonredacted cancer reports were divided into five large categories of product types: talc powders, topical moisturizers, hair products, miscellaneous, topical cleansers, and tanning products. These product classes are represented in the inner circle with blue, green, red, orange, purple, and light blue, respectively. The miscellaneous 11 category included oral hygiene products, nail polish, and lip products. The outer circle depicts specific cancer types associated

with each product class, with the size of each wedge being proportional to the number of reports. Of the 218 nonredacted cancer reports, 153 were associated with talc powders. The majority of cancer reports associated with talc were of ovarian cancer (n = 144). Other commonly associated classes included topical moisturizers (n = 23), hair products (n = 16), and miscellaneous (n = 12). Redacted reports included the reported adverse event; however, the associated product names were not released. Four thousand two hundred ten reports were associated with redacted product names, composing 95% of reported cancer cases, with the majority representing ovarian cancer reports.

Data of the European Cancer Registries indicate that the incidence of breast cancer 2016, which is the most common cancer among women, tends to increase not only in postmenopausal but also in very young women. The potential causes of breast cancer are genetic predisposition, long -term hormonal replacement therapy, alcohol, environmental pollution, and possibly modern lifestyle. The controversial results of several studies suggest that certain every day-use product (including cosmetic ingredients) may be linked to breast cancer. Some of these ingredients, such as ethylene oxide, have recently been classified by the International Agency for Research for Cancer as carcinogenic and mutagenic to humans, with sufficient evidence of carcinogenicity for breast cancer. Other ingredients, such as xenoestrogens, are chemicals which have an oestrogen -like effect or disrupt the normal metabolism the natural oestrogen and thus act as carcinogens. Some of them have been shown to result in DNA damage in animal and human mammary epithelial cells and, therefore, have the potential to generate genomic instability in the breast tissue. Examples of xenoestrogens with such properties include parabens, aluminium 12 salts, phthalates, or bisphenol A. No sufficient epidemiological data on humans have been published so far, and the effects of a mixture of chemicals to which women are exposed during lifetime on the incidence of breast cancer have not been investigated. However, the results of the available studies emphasize the need for analysis of adverse environmental factors, which, in addition to a genetic predisposition and natural aging, may contribute to the increased incidence of breast cancer.

According to the report from "American Cancer Society" 2016 May 28, Many of cosmetics products made-up of certain chemicals, particularly controversial are chemical considered to be "endocrine distributors" which can mimic the natural hormone oestrogen. When trade by the body or given as a drug, oestrogen affects reproductive organs and can raise the risk of certain cancer.

There is a good deal of controversy about the effects of much lower exposure to chemicals that mimic oestrogen in the body.

Researcher own views regarding this study was the data suggests that teenage girls have been attracted towards the use of cosmetics. And the chances of manifesting these Adverse Effects increase following the use of cosmetic products for a long time. Therefore, the general public and especially teenage need to be aware regarding the adverse effects of cosmetic products available in the market. Hence the investigator felt that there is a need to conduct a study on the knowledge of Adverse Effect of Cosmetics among Teenagers.

Aim of the study
The main aim of the study is to evaluate the Effectiveness of PowerPoint Assisted Teaching regarding Adverse Effects of Cosmetics Usage among Teenagers in a selected Junior College.

Methodology
A Quasi experimental research design was used. Random sampling technique was used with 60 sample size of teenagers. A panel of 8 experts ascertained the content validity of the tool. Structured questionaries' were prepared on adverse effects of cosmetics with two sections

Section A
Questionnaire related to demographic data including Age in years, Religion, Educational Qualification, Family income in rupees, Dietary pattern, Duration of Cosmetics Usage, Previous Experience of Adverse Effects with Cosmetics Usage, Previous Knowledge, and Source of Information.

Section B
Knowledge questionaries'. The data analysis was done by using descriptive and inferential statistics on the basis of the objectives and hypothesis of the study. The reliability of tool was observed with test retest method. The observed r value was 0.86 which was found reliable.
Pilot study was conducted on 6 samples in Vishwa

Chaitanya Junior College, Hyderabad. Pre-test was conducted on 20/05/2021 and post-test on conducted on 27/05/2021. Permission from the concerned authorities of the area was obtained before conducting the study. The purpose and the usefulness of the study were explained to concerned authorities before the taking permission. The convenient sampling technique was used for the selection of sample. The tool were distributed to the sample and investigated.

Results
Demographic data
50% of Teenagers were in the age group of 15-16 years and other 50% were in age group of 17-18 years. Most of the Teenagers 40% were from the Hindu religion. Majority of Teenagers 50% were from Intermediate first year and 50% from Intermediate second year. 96 Most of the Teenagers 58.4% had a family income of Rs. 10,001/- – Rs. 15,000/- Maximum of 54% had Non-Vegetarian dietary pattern. Most of the Teenagers 75% uses cosmetics since ≤6months. Highest percent i.e. 57% of them had no previous Knowledge of Adverse Effects of Cosmetics Usage. Majority of Teenagers i.e. 66.7% acquired information regarding Adverse Effects of Cosmetics Usage from Family members.
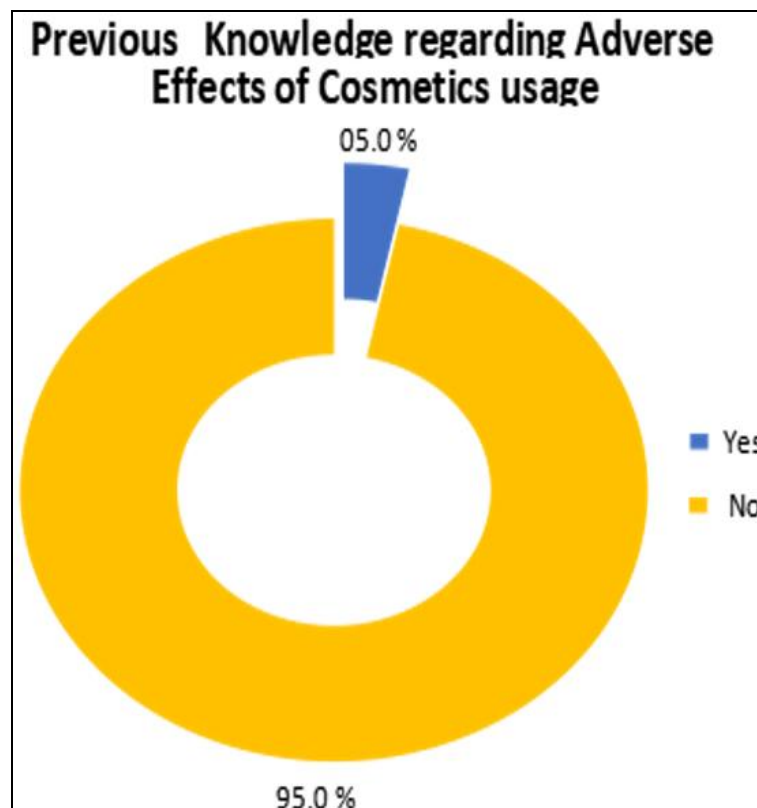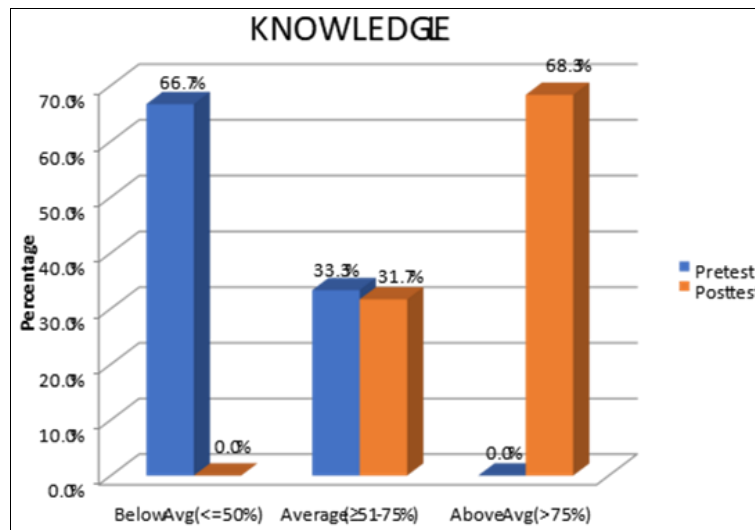

Fig 1: Percentage distribution of teenagers according to previous knowledge regarding adverse effects of cosmetics usage

The above figure shows the data on the percentage distribution of Teenagers according to Previous Knowledge regarding Adverse Effects of Cosmetics Usage among Teenagers. Majority i.e., 95.0 percent were not having Knowledge, while 05.0 percent were having Knowledge.

Analysis of the level of knowledge scores of teenagers regarding adverse effects of cosmetics usage

Fig 2: Percentage distribution of the Knowledge Score of Teenagers in Pre test

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Knowledge Scores	Mean	Standard deviation	Standard error	Paired 't'- test		DF	Inference
				Cal	Tab		
Pre-test	10.65	6.56	0.84	16.3	2.00	59	*S
Post-test	23.50	2.94	0.38				

*Significant at 0.05 level

The Table 5 depicts the mean, standard deviation and the standard error of Knowledge in Pre-test and Post-test. The mean score of Knowledge in the Pre-test is 10.65 and has been increased to 23.50 in the Post-test; there was an increase in the Post-test average Knowledge scores among Teenagers regarding Adverse Effects of Cosmetics Usage.

The paired 't' test was computed to find the Effectiveness of PPAT regarding Adverse Effects of Cosmetics Usage among Teenagers. The calculated value of 't' test was 16.3 which is greater than the tabulated value of 't' with 59 degree of freedom i.e., 2.00, was found to be significant at 0.05 level. It was indicated that the PPAT was highly effective. Hence, research hypothesis H_1 was accepted as there was a highly significant increase of Knowledge scores among Teenagers after administering PPAT regarding Adverse Effects of Cosmetics Usage among Teenagers.

Description of the association between Post-test Knowledge scores with selected Demographic variables
The results of association between Knowledge and Demographic Variables of Teenagers such as Age in years ($\chi 2$= 6.23, df =1), Educational Qualification ($\chi 2$= 4.8, df=1) at P<0.05 level. However, variables such as Religion ($\chi 2$= 3.99, df=2), Family income in rupees ($\chi 2$=2.59, df=2), Dietary pattern ($\chi 2$=1.10, df=1), Duration of Cosmetics usage ($\chi 2$= 1.68, df=2), Previous Experience ($\chi 2$=0.08, df=1), Previous knowledge ($\chi 2$=0.08, df=1) and Source of Information ($\chi 2$=3.00, df=1) were not found to be significant. It was evident from the result that the Teenagers were influenced by Age in years, Educational Qualification. Hence the research hypothesis (H2) was accepted for association of Knowledge with Demographic variables such as Age in years and Educational Qualification and research hypothesis (H2) was rejected for Demographic variables such as Religion, Family income in rupees, Dietary pattern,

Duration of cosmetics usage, Previous Experience of adverse effects with cosmetics usage, Previous Knowledge and Source of Information regarding Adverse Effects of Cosmetics Usage.

Discussion
Dayalal. D. *et al*. (2020) conducted a pre-experimental study to assess the effectiveness of the Structured Teaching Programme on Knowledge regarding adverse effects of face care Cosmetics among Adolescent Girls in selected Colleges of Mehsana. Hundred samples were selected using a Non probability convenience sampling technique. Findings depicted that the Pre-test mean score was 9.77 and the Post-test mean was 17.1, paired 't' test value was 3.58 and calculated value was 25.77. The calculated value was greater than the tabulated value, thus the Knowledge increased after the intervention. The study concluded that the Structured Teaching Programme was effective in enhancing knowledge among Adolescent Girls. The present study revealed that majority 66.7% of Teenagers had below average knowledge, while 33.3% had average knowledge and none of them had above average knowledge regarding Adverse Effects of Cosmetics Usage. The present study Post-test mean Knowledge score was 23.50 with a standard deviation of 2.94 significantly higher than the Pre-test mean score. The statistical paired 't' test value for overall Knowledge was found to be 16.3 which is greater than tabulated t value 2.00 indicating that there was a difference in Pre-test and Post-test Knowledge score and was found to be statistically highly significant at 0.05 level. Thus we can ensure the Effectiveness of PPAT on improving Knowledge regarding Adverse Effects of Cosmetics Usage. There was statistically no significant association found between the level of Knowledge and the Demographic variable of Hypertensive Client such as Religion, Family income in

rupees, Dietary pattern, Duration of cosmetics usage, Previous Experience of adverse effects with cosmetics usage, Previous Knowledge and Source of Information.

Conclusion
The Cosmetic products may present health risks and recurrent adverse effects are attributed to the toxic substances commonly found in their formulations. Although the various structures for the regulation and quality control of cosmetics around the world are quite complex and comprehensive, they should be more rigorous in the inclusion of new substances with toxic potential in the formulation of cosmetics to avoid damages to human health. The main goal of this study is in sharing this information to empower Teenagers to make better decisions for themselves in selecting the right cosmetic product. Hopefully, one day there will be better regulation in the cosmetics industry and all personal care products will be safer. Until then, check product labels for the harmful ingredients in makeup and skincare products, and find cosmetic companies you can trust.

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