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Comparative study on safety knowledge of Deodrant/Antiperspirant among college students

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The paper deals with the survey about the safety knowledge of college students on deodorant or antiperspirant. The college students have been chosen from colleges situated in urban and rural areas of West Bengal. A structured questionnaire has been developed and used for the survey on the undergraduate college students. Descriptive statistics and t-tests have been computed for analyzing the data statistically. The results show that there is significant difference in safety knowledge between college students from rural and urban areas.

Keywords: Deodorants, Antiperspirant, Safety knowledge, College students

I. INTRODUCTION

College students generally belong to the late adolescent stage. Adolescence is a period of rapid biological growth and development. The activity of the growth hormones is at its peak, and one of its manifestations is increased secretion by sweat and oil glands. Excessive sweating (hyperhidrosis) is the primary reason for body odor in adolescence or teens. This is due to overactive sweat glands. This is because with the onset of puberty, there are many hormonal changes taking place in the body that causes increased sweating. The sweat produced is odorless,but bacteria on the skin surface decompose the sweat into ammonia and fatty acids that emit a peculiar or pungent odor (Patel, 1996).

There are two kinds of sweat glands in the human body the Eccrine glands and Apocrine glands. The Eccrine glands are evenly spread all over the body. The Apocrine glands are accumulated more around the genitals and underarms. Eccrine glands release sweat that has salt content and helps in cooling the body, it is a good sweat. Apocrine glands become very active only during puberty. The bacteria in the skin are attracted to the Apocrine secretions more than the sweat released by the Eccrine glands. It is the combination of the bacteria and the sweat from the Apocrine glands that produces body odor (https://www.chemistryviews.org dated 31.03.2020).

To prevent and control body odor the college girls and boys often use deodorants to cover or block the body odor, or use antiperspirants to dry up or prevent sweating. Antiperspirants containing aluminum zirconium and aluminum chloride are considered effective. There are mainly three types of deodorants used in the market stick, roll-on and spray. Aerosol deodorant sprays use gases as propellants, but these are not pure sources. Deodorants may contain fluorocarbons and/or butane, isobutane, propane alpha-isomethyl ionone, benzyl alcohol, benzyl benzoate, benzyl salicylate, butylphenylmethylpropional, citral, coumarin, eugenol, geraniol and hydroxyisohexyl-3-cyclohexene(Emsley,2015 & Qurishi et.al, 2018). Aerosol antiperspirants are designed to work via a thin film which is propelled onto the skin (Shen and Nardello-Rataj, 2009). To create this film, products contain low, medium and high pressure propellants which produce a strong, but comfortable, spray to reach the skin. These propellants are commonly butane, isobutane and propane.They are useful in three-phase (two-layer) aerosol systems because they are immiscible with water and have a density less than 1. The hydrocarbons remain on top of the aqueous layer, and provide the force expel the contents from the container. As they contain no halogens, hydrolysis does not occur making them good propellants for water-based aerosols (Dar, 2018).The main disadvantage is that they are flammable, and can explode. Many deodorants and antiperspirants also contain aluminum chlorine hydrate, propylene glycol, triclosan and stearine.

College-going boys and girls are particularly in risk zone due to common over-use. Inhaling chemicals from the aerosols may cause allergic skin reactions, asthma and breathing difficulties. Propellants can cause frostbite if sprayed for too long caused by rapid cooling of propellant during expansion (May et. al, 2010 & https://www.abc.net.au/news/2007-07-10/deodorant-burns-on-the-increase/94912 dated 31.03.2020).In very rare cases they may even trigger fatal heart problems (Walsh, 2013, https://www.dailymail.co.uk/health/article-2402692, dated 31.03.2020).

Many of college students have no idea about how to use deodorant or antiperspirant and they sometimes over-use or use it improperly. Although directions are printed on the bottle of deodorants, they rarely follow them.This lack of awareness or insufficient safety knowledge can be very harmful for their health. Moreover, any negligence can lead to accidental situationsbecause these are highly flammable. So, it is very important to assess the safety

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information about deodorant/antiperspirant among the college students.

Objectives of the Present Study

1. To determine safety knowledge among college students.

2. To find out is there any significant difference on safety knowledge of rural and urban areas college students.

To fulfill the above objectives the following hypotheses were framed:

- There is a significant difference in safety knowledge between students of rural colleges and urban colleges.

- Safety knowledge of urban areas college students on deodorant is higher than that of rural college students.

II. METHOD

A. Study Area

The survey of the study was carried out in colleges situated in rural and urban areas of West Bengal, India. For urban area colleges in Dum Dum, Dunlop, Kankurgachi, Sinthi were selected. Colleges in Shyampur, Belpukur, Gobindapur, Sasati in an around Howrah district were chosen for rural area.

B. Sample

The sample size of college students was 100, 50 from rural areas and 50 from urban areas.Purposive sampling technique was followed to select the subjects. They were all under-graduate students and majority of them belonged to middle class. There were both male and female students in the samples.

C. Tool

A Structured questionnaire was developed in local language regarding safety information about deodorants/antiperspirants. It consisted of 12 questions and for each item there were two options, “Yes” and “No”. Score of 1 was given for “Yes” response and score of 0 was given for “No” response. The positive responses were summed up and the percentage of the total score indicated safety knowledge of the subject.

D. Procedure

Data of college students were collected from their respective colleges on fixed dates after taking prior consent from the college authorities. The students who were not having classes at that time were requested to give the data. The aim of the present study was explained to them and then the questionnaires were distributed. They were asked to fill up the questionnaire according to the instructions. Finally they were thanked for their cooperation. Appendix present the questionnaire.

After collecting the data from the sample, the responses of each subject were scored and then the percentage of the total score was computed for each individual subject. Then these scores were tabulated for statistical analysis.The mean and standard deviation (SD) were calculated for students of urban and rural areas separately. Then the difference between the means was computed and the t value for the independent samples of equal sizes was calculated to test the level of significance.

III. RESULT AND DISCUSSION

TABLE I: Percentage scores on safety knowledge of urban areas college students.

Range of scores	Percentage of students
0-10	0
11-20	4
21-30	6
31-40	14
41-50	32
51-60	10
61-70	18
71-80	6
81-90	8
91-100	2

Table. 1 represents the percentage score on safety knowledge on deodorant/antiperspirant of urban areas college students. This table shows that only 2% students have acquired 91% - 100% which is high range of percentage scores and 4% students have obtained 11% - 20% safety knowledge. There is no one in the lowest range of percentage scores which is 0% - 10%. The majority of scores of the urban areas college students fall between 41% - 50% percentage of scores.

Table. 2 represents the percentage score on safety knowledge on deodorant/antiperspirant of rural areas college students. This table shows that only 2% students have acquired 91% 100% which is high range of percentage scores and 10% students have obtained 11% - 20% of safety knowledge. There are no students in the lowest

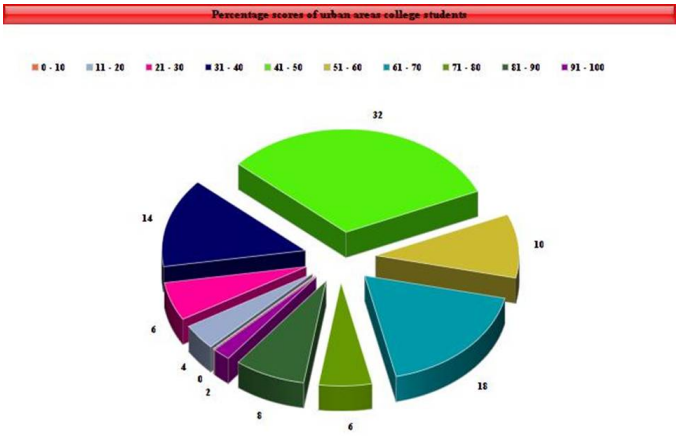

FIG. 1: Pie chart on the percentage scores of urban areas college students.

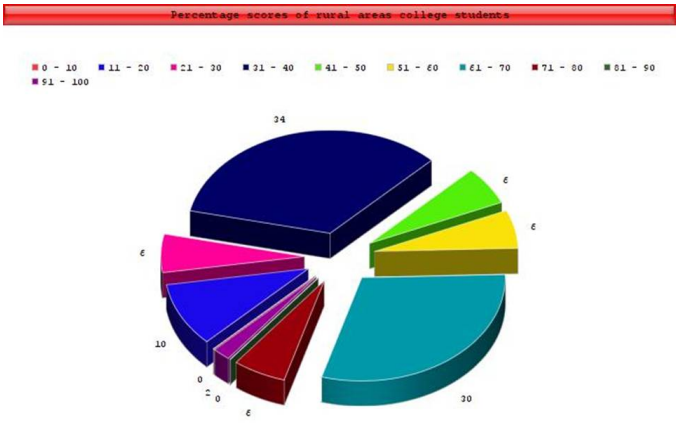

FIG. 2: pie chart on the percentage scores of rural areas college students.

TABLE II: Percentage scores on safety knowledge of rural areas college students.

Range of scores	Percentage of students
0-10	0
11-20	10
21-30	6
31-40	34
41-50	6
51-60	6
61-70	30
71-80	6
81-90	0
91-100	2

range of percentage scores which is 0% - 10%. The majority of scores of the rural college students fall between 31% - 40% percentage of scores.

Further, the statistical analysis reveals that in case of urban college students and rural college students the mean scores are 6.52 and 5.52 respectively and the SD scores are 2.34 and 2.24. The calculated t value is 2.1796 which is greater than the table value at $p < 0.05$ level. The mean values show that safety knowledge of urban college students is higher than that of rural college students.So both the hypotheses are accepted.

The findings of the present study imply that college students have inadequate safety knowledge about the deodorants or antiperspirants. So it is necessary to create a general awareness on health and safety issues related deodorant or antiperspirant. The following recommendations on use of deodorants or antiperspirants can be provided:

1. Aluminum in deodorants may be harmful because it is the active ingredient in antiperspirant that keeps dry and blocks the sweat ducts under arms, so the sweat cannot come out. But sweating is way of human body which naturally eliminating toxins. But blocking sweat ducts, the aluminum is essentially forcing body to reabsorb these toxins. Aluminum in deodorants may be contributing to an increased risk of Alzheimers disease or cancer.

2. Parabens are preservatives that prevent bacteria and mold from growing deodorant. They mimic estrogen in the body, disrupting your natural hormone mechanisms, and potentially cause reproductive issues.

3. A Phthalates plasticizing chemical is used to make deodorant more pliable and enhance absorption of deodorant fragrance on skin, making the scent last longer. Phthalates also have been linked to birth defects and asthma.

4. Polyethylene glycol, more commonly known as PEG followed by a specific compound, is used as a thickener and solvent in both cosmetics and a wide variety of products. PEGs may also be contaminated with potential carcinogens ethylene oxide and 1,4-dioxane.

5. Traditional stick deodorants are formulated with propylene glycol, which gives the stick its firm texture. Propylene glycol is usually derived from natural gas or petroleum and can irritate your skin.

6. Most synthetic fragrances are composed of hundreds of chemicals, which may include hormone disruptors and allergens.

The college students should be encouraged to control use of deodorants because of their harmful chemical effects. They should know that most of deodorants are

combined chemical compounds which have several health effects. They should practice some safety measures:

i. Keep deodorant containers in a cool place away from heat and direct sunlight.

ii. Do not expose to temperatures exceeding500C.

iii. Do not spray near naked flame or incandescent material

iv. Avoid contact with eyes or nose or ears, if contact occurs wash with plenty of water and consult a doctor

v. Do not apply on broken skin

vi. Do not use if irritations or rashes occur

vii. Keep out of reach of children

viii. Never use internally

ix. It is highly inflammable, so be careful and never use in near of open flame

x. Always use the right directions recommended by the product

IV. CONCLUSION

The present study focuses on an important issue related to safety knowledge on deodorants/antiperspirants of college students. Statistical result shows that there is a significant difference on safety knowledge between rural and urban areas college students. By analyzing the percentage of students according to range of percentage scores it is observed that the students, specially the rural students, have insufficient information. In order to increase their knowledge a list of recommendations has been incorporated for limited and proper use of deodorants /antiperspirants.

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