



(RESEARCH ARTICLE)



Effectiveness of a planned teaching programme among the high school students on hazards of plastic use at selected school of Gwalior (M.P.)

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Abstract

Humans are vulnerable to the short- and long-term health risks associated with plastics. Being the biggest user of plastic, the packaging industry can't turn a blind eye to the disastrous results of careless plastic consumption. Its hazardous effects and inability to break down in the environment make it a major concern. With the correct kind of early childhood education, we can improve children's health. Various sorts of information can be provided to youngsters in order to alter their lifestyle. Therefore, in order to phase out the use of plastic from daily life and safeguard the health, it is vital to have a planned teaching program that informs high school students about the hazards of plastic use. The area wise knowledge scores of post-tests were highly significant in all areas except regarding the use of plastics. There was no association of knowledge scores and selected variables like class of study, age, sex and religion. The results demonstrated that the proposed educational program was highly successful in raising high school students' awareness of the risks associated with plastic use.

Keywords: Plasticizers, Polyvinyl Chloride; Di-Ethyl Hexyl Phthalates; Polystyrene; Poly Chlorinated Biphenyls; Non-Biodegradable; Planned Teaching Program; Hazards of Plastics

1. Introduction

Science and technology are advancing quickly worldwide. These advancements produce both beneficial and detrimental consequences on individuals. Plastic manufacturing is among the most hazardous processes. Plastic comprises a variety of chemical substances, primarily consisting of high molecular weight compounds known as polymers, which transition from a malleable state to a solid form in their ultimate state. Plastic has permeated every facet of human existence. Its significance is established from birth through its utilization in various forms such as catheters, masks, and sheets, continuing until death with its diverse applications. It has been utilized for packaging, transporting, storing, and wearing, which has increased the risk associated with its exposure. It has emerged as a health and environmental danger.

Plastics are utilized globally on a regular basis. The term plastic refers to several synthetic or semi-synthetic materials. The phrase originates from the Greek word *Plastikos*, or "suitable for molding." "Plastics" are named for their ability to be molded, cast, extruded, or treated into many shapes, including solid objects, films, and filaments. These features stem from their molecular composition. Plastics are polymers, extensive chain molecules composed of interconnected subunits (monomers) via chemical bonds. The monomers of petrochemical plastics are inorganic substances (such as styrene) and are non-biodegradable.

An environmental hazard is a material, condition, or occurrence that can pose potential hazards to the environment or detrimental impacts on human health (Shiv, K. & R. Dagar, 2018). Plastic is extensively utilized because of its affordability and diverse functional attributes; yet, it poses numerous significant detrimental repercussions on

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consumer health in various direct and indirect manners (Kumar. P, 2018). Plastic is composed of plasticizers that enhance its fluidity and flexibility. The predominant plasticizers are phthalates, specifically DEHP (Di-Ethylhexyl Phthalate) and DINP (Di-Isononyl Phthalate). DEHP has numerous applications, including footwear, printing inks, toys, and food wrapping.

They possess the potential to induce endocrine disturbances, reproductive consequences, and developmental impairments. Significant constituents of plastic, including polyvinyl chloride, dioxins, and plasticizers, induce substantial health issues, such as hormone disruption, reproductive dysfunction, and breast and testicular malignancies. The detrimental effects of plastic are apparent in pregnant women and neonates due to direct exposure to plastic things. Babayemi, J. O., et al. (2016). Phthalates are utilized in plastic usage to provide flexibility and shape. They are utilized in various products, including toys, food containers, and plastic wraps.

2. Material and Methods

- Setting: The setting of the study was a school at New Regional convent school Gwalior.
- Research design: The quasi-experimental study design was used in this study by using a pre and post-test phase.
- Population: The study's target population comprised 100 pupils from the New Regional convent school Gwalior.
- Research instrument: A meticulously designed and implemented questionnaire from the study is utilized to gather data from the participants.
- Data collection: The questionnaire was disseminated to the schoolchildren.
- Data analysis: Data analysis is conducted using SPSS (version 21). Demographic variable data were analysed using percentages and frequencies represented in bar charts. Data pertaining to knowledge of oral hygiene, both pre- and post-intervention, was examined utilizing a paired T-test. The study employed a 95% confidence level, with a P-value of < 0.05 deemed statistically significant.
- Ethical consideration: The study's goal was elucidated to the participants to guarantee their complete cooperation.
- Study timeline: Duration of the study was 07 January -14 January 2024 (07 days).

3. Results

This section delineates the demographic attributes of the participants and the study outcomes concerning awareness of plastic usage and its associated health risks. This also illustrates the outcomes of the paired t-test comparison conducted before and after the intervention, as well as the findings related to the purpose of this study: "To evaluate the impact of a health education session on high school students' knowledge regarding plastic usage and its associated health risks."

Table 1 Frequency and Percentage Distribution of Sample Characteristics **N=100**

Sl. No.	Variable	Frequency	Percentage
1	Class of study		
	VIII	45	45%
	IX	28	28%
	X	27	27%
2	Age in years		
	13-14	32	32%
	14-15	41	41%
	15-16	27	27%
3	Religion		
	Hindu	73	73%
	Muslim	20	20%
	Christian	7	7%

4	Sex		
	Male	45	45%
	Female	55	55%
5	Monthly income (in Rupees)		
	1,000-5,000	52	52%
	5,001-10,000	26	26%
	10,001-15,000	22	22%
	Above 15,000	-	-

The data shows no change of scores regarding “use of plastics” and they held 100% knowledge in both the tests. However, there was significant improvement in the post-test ($x_2 = 10.59$, $x_1 = 5.53$) about the “hazards of plastic use” and “prevention of hazards” in comparison to their pre-test result ($x_2 = 5.53$, $x_1 = 3.95$) respectively. It is represented in a bar diagram.

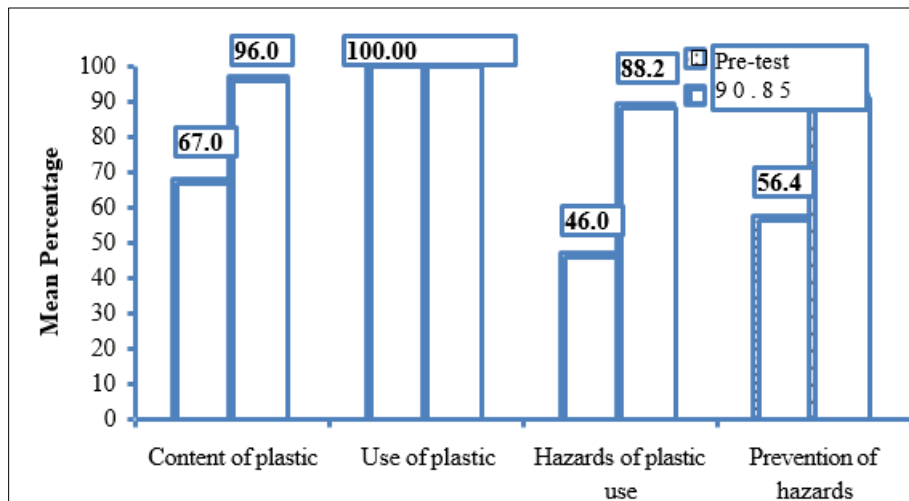


Figure 1 Bar presentation of plastic use

The importance of the mean difference between pre-test and post-test knowledge scores was evaluated using a paired t-test, and the results are displayed in the table. The subsequent null hypothesis was established to evaluate the significance.

The study results indicated a larger range, mean, and median, along with a lower standard deviation in post-test knowledge scores compared to pretest levels. The notable correlation with the 't' value ($t_{91}=28.7$, $p<0.05$) demonstrated an increase in post-test knowledge and affirmed the study's efficacy. This contradicts the results of an evaluative method and a one-group pretest-posttest design used to assess the efficacy of a training technique on dental care. This signifies that the proposed instructional strategy was an efficacious means to enhance the knowledge level of any demographic group.

Pretest knowledge scores of high school pupils were not associated with certain demographic characteristics, such as class of study, age, sex, or religion, according to the chi-square test. Our results demonstrate that the sample was representative of the homogeneous group. More extensive research with a larger sample size can strengthen the correlation between the aforementioned factors, leading to more substantial conclusions.

4. Conclusion

The purpose of a school is to offer a nurturing setting for children throughout their formative years. The school is a great place for the nurse to spread health promotion messages to the community's youth and adults. This study aims to address a prevalent human health concern that poses a high risk of illness to youngsters. There are a lot of risks

associated with plastic use, and health education is the most effective tool for reducing those risks. The study's conceptual model was derived from Betty Neuman's approach. In light of the known risks and the perceived severity of those risks, the model predicts how likely people are to take precautions to avoid plastic pollution. The perceived knowledge and likelihood of preventative action of children can be determined by comparing their knowledge before and after health education. The evaluation strategy was used in this study. The participants in the study were high school students (13–16 years old) enrolled in English Medium Aided programs. One hundred high school students were chosen at random using a stratified random sample technique, with the schools being selected using a convenient sampling technique. The criteria for selection were predefined.

Information was gathered through the use of a structured knowledge questionnaire. The knowledge scores were utilized to determine the efficacy of the intended instructional program. Before the pilot trial, we made sure the tool was reliable and had good content validity. Ten high school students participated in the pilot project. The primary research involved one hundred high school students from a randomly chosen GWALIOR school. Using both descriptive and inferential statistics, the collected data was examined in relation to the hypotheses and objectives. For the purpose of hypothesis testing, a significance threshold of 0.05 was chosen.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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