

“A Study to Assess the Effectiveness of Computer-Assisted Instructions on Knowledge and Attitude Regarding Hazards of Use of Plastic Products Among the School Children at Selected Urban School.”

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ABSTRACT

Plastic pollution poses major environmental and health dangers, but awareness among school children remains low. This study set out to evaluate how well computer-assisted instruction (CAI) has worked to raise school children's awareness and attitudes towards the risk association with plastic hazards. Pre- and post-test control groups were non-equivalent and employed a quasi- experimental approach. A suitable non-probability sampling method was used to select thirty children from Sahyadri Vidya Mandir in Mumbai. They were subsequently divided into two groups. Experimental (n=15) and control (n=15). Both before and throughout the session, knowledge and attitude were assessed using a Likert scale and a standardized study. The control group did not receive any intervention, whereas the experimental group was given CAI. Pre-test findings showed that the majority of students in both groups lacked appropriate information (86.66% in the experimental group, 80% in the control group) and had a moderate attitude (40% in the experimental group, 73.33% in the control group). Post-test findings showed that 100% of students in the experimental group had gained enough knowledge and attitude, but the control group did not significantly improve. Statistical analysis revealed a substantial increase in the experimental group's attitude ($t = 10.06$, $p < 0.05$) and knowledge ($t = 17.45$, $p < 0.05$). Post-test comparisons across groups further validated the effectiveness of CAI, revealing a significant difference in attitude ($t = 36.46$, $p < 0.05$) and knowledge ($t = 19.90$, $p < 0.05$). The results of the study show that CAI is an extremely effective teaching strategy for improving school children's knowledge and attitudes on the problems associated with plastic. These findings demonstrate how crucial it is to include CAI in school curricula to promote environmental conscious behavior and sustainable practices.

INTRODUCTION:

Plastic is a versatile and widely useful material that is used extensively in sectors like electronics, healthcare, and packaging, its widespread use has resulted in major health and environmental issues. Large trash patches and animal suffering are two effects of plastic pollution, particularly in oceans. Plastic remains in the environment for a long time because they are difficult to decompose. Plastic can leak harmful compounds like BPA and phthalates, which can lead to health problems. Micro plastics also presents threats to our food and water. We need alternatives, improved recycling, less plastic, trash management, and plastic education to solve these problems.

PROBLEM STATEMENT:

“A study to assess the effectiveness of Computer Assisted Instruction on knowledge and attitude regarding hazards of use of plastic products among the school children at selected urban school children.

OBJECTIVES:

To assess the knowledge and attitude regarding hazards of plastic products among the urban school in experimental and control groups.

To compare the pre and post-test knowledge and attitude between the experimental and control group regarding hazards of use of plastic products among urban school children.

To evaluate the effectiveness of computer-assisted instruction regarding the hazards of use of plastic products among the urban school children in experimental group.

Hypothesis:

H0: There is no significant difference in knowledge and attitude scores regarding hazards of use of plastic products between the experimental and control group after the intervention.

H1: There will be a significant difference between the pre-test and post-test level of knowledge regarding hazards of use of

plastic products among the urban school children in experimental and control groups.

REVIEW OF LITERATURE:

James A Weaver, Brandiese E J Beverly, et.al, 2020 Sep 19, conducted research on Hazards of diethyl phthalate (DEP) exposure: A systematic review of animal toxicology studies. Systematic review of animal studies to assess its health impacts. Thirty-four studies were analyzed, revealing that DPE exposure did not affect male reproductive development during gestation but showed moderate evidence of impacting sperm quality in peripubertal and adult stages. Developmental effects were also noted, primarily reduced postnatal growth linked to maternal exposure. Moderate evidence suggested DEP could affect liver function, with increased liver weight observed at higher doses. Female reproductive effects were less pronounced, with slight evidence of impacts on maternal weight gain and organ sizes. Evidence regarding cancer and kidney effects was limited or inconsistent.

Ying Sun, Haonan He, 2023 Feb 21, conducted research on Understanding consumer's purchase intentions of single-use plastic products, This study investigates the factors shaping the intention to purchase single-use plastic products in china using the theory of planned behavior, Given China's significant role in global plastic production and consumption, understanding these factors is crucial for addressing environmental concern. Analyzing data from 402 valid questionnaires using Amos 22.0 and SPSS 18.0 software, the study finds that attitude towards single-use plastics, perceived behavioral control, normative and informational social influences, and positive anticipated emotions all positively influence the intention to purchase these products.

As a whole, the above review of literature, the summery provides an overview of existing research on plastic hazards and the effectiveness of computer-assisted instruction (CAI) in improving knowledge and attitude. It focuses on the environmental and health consequences of plastic use, such as micro plastic contamination and toxic chemical exposure.

RESEARCH METHODOLOGY:

RESEARCH APPROACH:

Quantitative Evaluative Study

RESEARCH DESIGN:

Quasi-experimental pre-test and post-test control group design

VARIABLES OF THE STUDY:

• Independent Variables:

Computer-Assisted Instruction regarding hazards of use of plastic products.

• Dependent product:

Knowledge and attitude regarding hazards of use of plastic products.

CRITERIA FOR SAMPLES SELECTION:

• Inclusion criteria:

- The school children who were age between 13 to 16 years.
- The children were studying in urban schools.
- They could read, write, and understand English.
- They were available during the data collection period.

• Exclusion criteria:

- Children who refused to participated in the study.
- Children who were ill at the time of study.

TARGET POPULATION:

Target population of this study comprises from urban are who are relevant to the investigation of knowledge and attitude towards the hazards of using plastic products.

ACCESSIBLE POPULATION:

In this study accessible population includes students from Sahyadri Vidya mandir, Bhandup West, Mumbai, who were eligible and available to participate in this study.

SAMPLE SIZE:

The sample size for the present study is 30 eighth standard school children who were studying in the selected urban school.

- Experimental group- 15 students
- Control group- 15 students

SAMPLE TECHNIQUE:

In this study, Non probability-convenient sampling technique is used.

METHOD OF DATA COLLECTION:

1. Permission and approval:

Informed consent was obtained from the school authorities of Sahyadri Vidya Mandir, Bhandup West, Mumbai to carry out the study.

2. Participant Selection:

A total of 30 students were chosen and decided into two groups: 15 in the experimental group and 15 in the control group.

3. Pre-test assessment:

Prior to implementing the intervention, a structured questionnaire and Likert scale were administered to evaluate student's existing knowledge and attitude regarding the risks of plastic use.

4. Intervention (Computer-Assisted Instruction):

The experimental group received computer-assisted instruction about the risks of plastic use, whereas the control group did not undergo any such intervention.

5. Post-test assessment:

Following the intervention, the same questionnaire and Likert scale were utilized to evaluate the change knowledge and attitude among students in both groups.

PLAN FOR DATA ANALYSIS:

The study will use both descriptive and inferential statistics to assess the impact of computer- assisted instruction (CAI) on school children's knowledge and attitude towards plastic use hazards.

- Descriptive statistics:

- Percentage, frequency, mean, and standard deviation will describe demographic data.

- Inferential Statistics:

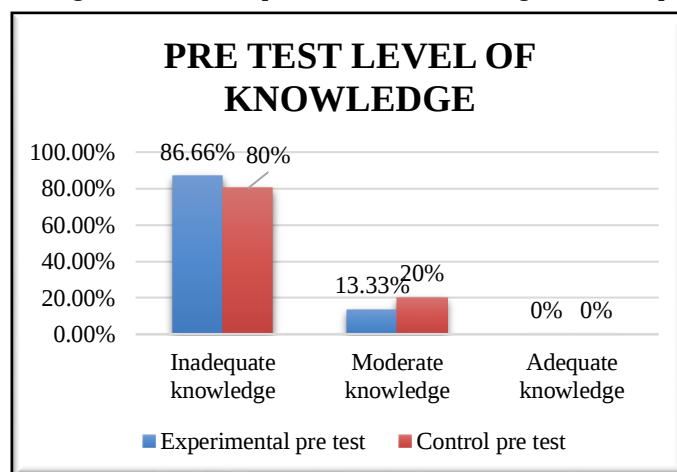
- Paired t-test will evaluate the effectiveness of CAI on the knowledge of plastic hazards among urban children.

- Unpaired t- test will compare knowledge and attitude scores between the experimental and control groups.

FINDINGS AND INTERPRETATION:

Section: 1: Assessment of pre-test levels of knowledge and attitude regarding hazards of use of plastic products among the urban school children.

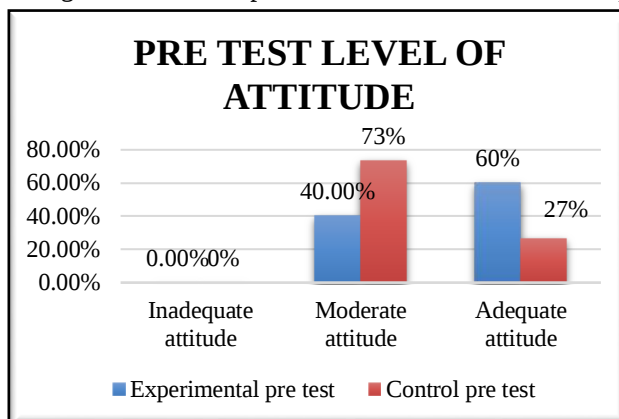
Figure1: Represent the percentage distribution of pretest level of knowledge in both experimental and control group.



The figure shows the pre-test knowledge distribution on plastic hazards among school children in both groups. In experimental group, 86.66% had inadequate knowledge, 13.33% had moderate knowledge, and none had adequate knowledge.

Similarly, in the control group, 80% had inadequate knowledge, 20% had moderate knowledge, and none had adequate knowledge.

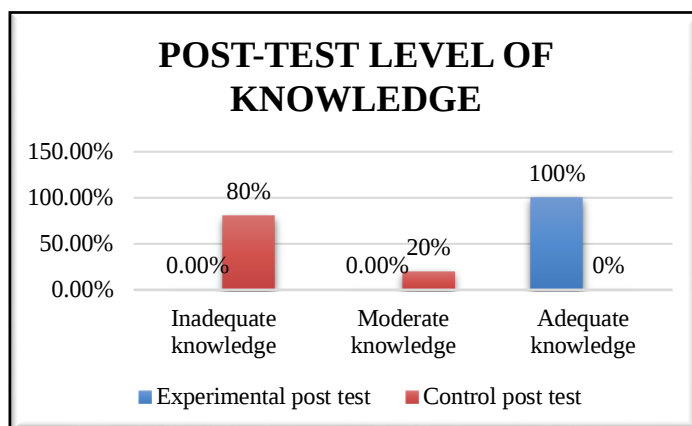
Figure 2: Represent the percentage distribution of pre-test level of attitude in both experimental and control group.



The figure shows the pre-test attitude distribution on plastic hazards among school children in both groups. In the experimental group, 40% had a moderate attitude, 60% had an adequate attitude, and none had an inadequate attitude. In the control group, 73.33% had a moderate attitude, 26.66% had an adequate attitude, and none had an inadequate attitude.

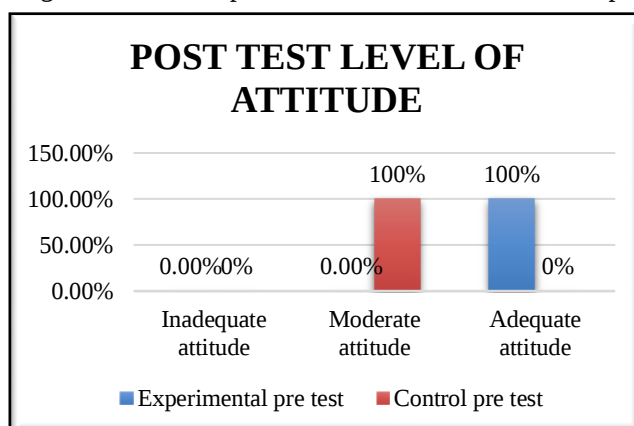
Section 2: Assessment of post-test levels of knowledge and attitude regarding hazards of use of plastic products among the urban school children.

Figure 3: Represent percentage distribution of post-test level of knowledge in both experimental and control group.



The figure shows the post-test knowledge distribution on plastic hazards among school children in both groups. In the experimental group, 100% had adequate knowledge, with 0% in the moderate category. In the control group, 80% still had inadequate knowledge, 20% had moderate knowledge, and none reached an adequate level.

Figure 4: Represent percentage distribution of post-test level of attitude in both experimental and control group.



The figure shows the post-test attitude distribution on plastic hazards among school children in both groups. In the experimental group, 100% had an adequate attitude, with 0% in the moderate or inadequate categories. In the control group, all remained in the moderate category, with 0% achieving an adequate attitude.

Section 3: Comparison of pre and post-test level of knowledge and attitude regarding hazards of use of plastic products among the urban school children in both experimental and control group.

Figure 5: Comparison of pre-test levels of knowledge in both experimental and control group.

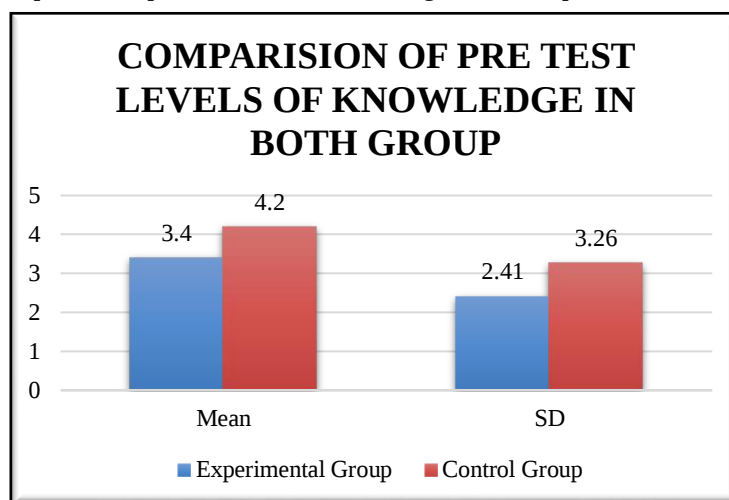
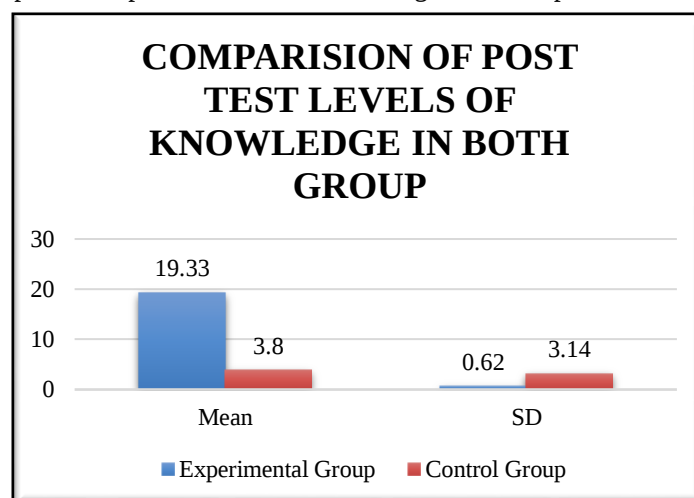


Figure 6: Comparison of post-test levels of knowledge in both experimental and control group.



The figure compares the mean and SD of knowledge levels in both groups before and after the intervention. In the experimental group, the pre-test mean was 3.40 (SD=2.41), improving to 19.33 (SD=0.62) post-intervention. The t-value (17.45) was highly significant at 0.05, proving the effectiveness of computer-assisted instruction. In contrast, the control group showed minimal change, with a pre-test mean of 4.20 (SD=3.26) and a post-test mean of 3.80 (SD=3.14). The t-value (1.38) was not significant, indicating that without intervention, knowledge levels remained nearly the same. This confirms that computer-assisted instruction significantly improves knowledge about plastic hazards.

Figure 7: Comparison of pre-test levels of attitude in both experimental and control group.

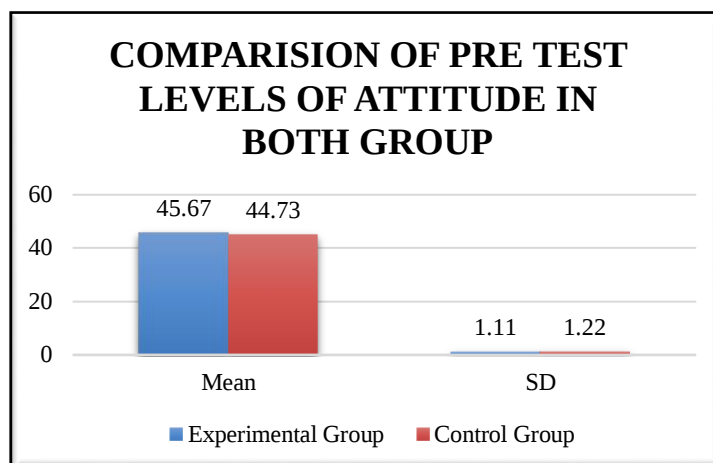
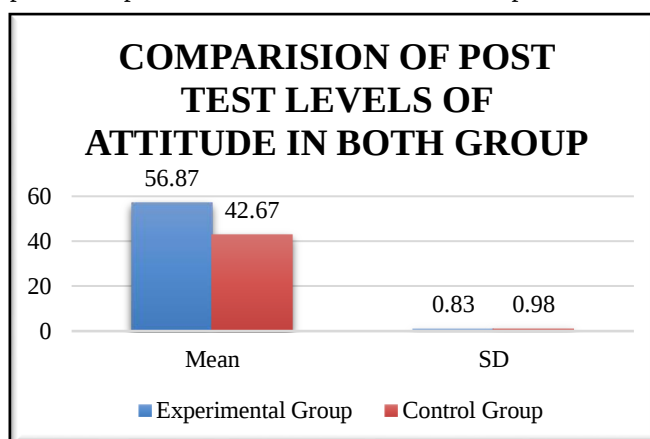


Figure 8: Comparison of post-test levels of attitude in both experimental and control group.



The figure compares the mean and SD of attitude levels in both groups before and after the intervention. In experimental group, the pre-test mean was 45.67 (SD=1.11), improving to 56.87 (SD=0.83) post-test. The t-value (10.06) was significant at 0.05, showing a positive impact of computer-assisted instruction. In contrast, the control group had a pre-test mean of 44.73 (SD=1.22), which decreased to 42.67 (SD=0.98) post-test, with a t-value of 9.80, indicating no significant improvement. This suggests that computer-assisted instruction effectively improved attitudes towards plastic hazards.

Section 4: Comparison of experimental and control group level of knowledge and attitude regarding hazards of use of plastic products among the urban school children.

Figure 9: Comparison of experimental and control pre-test level of knowledge in experimental and control group.

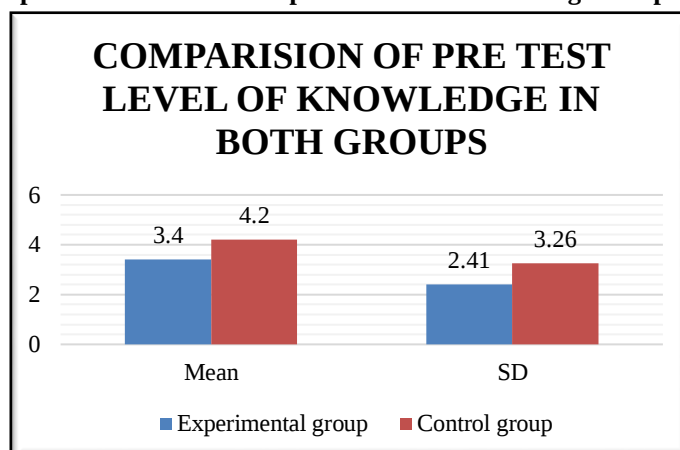
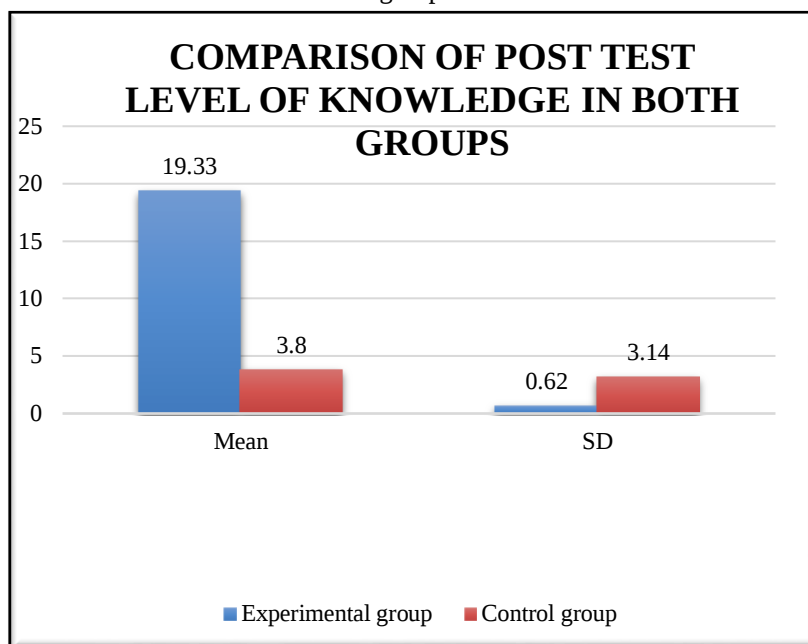


Figure 10: Comparison of experimental and control group post-test level of knowledge in experimental and control group.



The figure compares pre-test and post-test knowledge levels in both groups. In pre-test, the experimental group's mean was 3.40 (SD=2.41), while the control group's was 4.20 (SD=3.26), with a t-value of 0.87 (not significant at 0.05). Post-test results showed a mean of 19.33 (SD=0.62) in the experimental group at 3.80 (SD=3.14) in the control group, with a t-test value of 19.90 (significant at 0.05). This suggests that computer-assisted instruction effectively improved knowledge about plastic hazards.

Figure 11: Comparison of experimental and control group pre-test level of attitude between experimental and control group

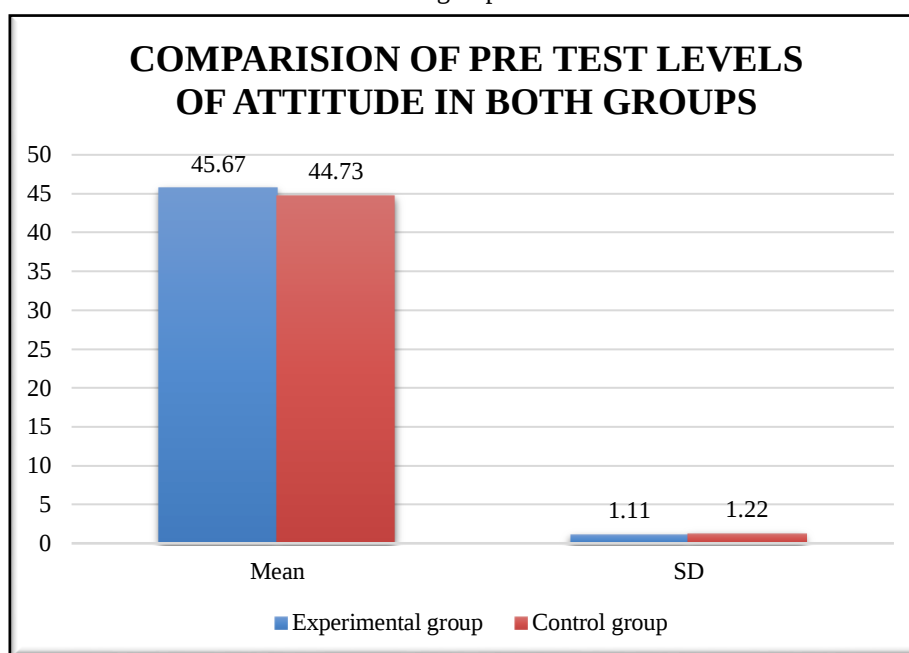
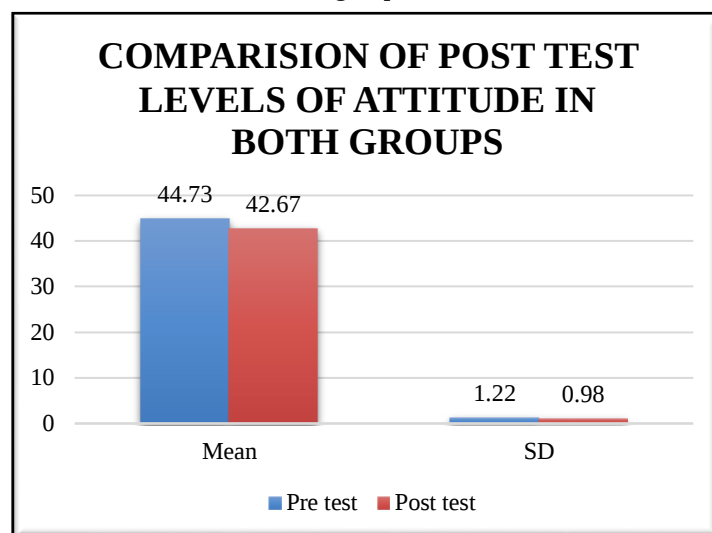


Figure 12: Comparison of experimental and control group post-test level of attitude between experimental and control group.



The figure compares pre-test and post-test attitude levels in both groups. In the pre-test, the experimental group's mean was 45.67 (SD=1.11), while the control group's was 44.73 (SD=1.22), with a t-value of 1.04 (not significant at 0.05). Post-test results showed a mean of 56.87 (SD=0.83) in the experimental group and 42.67 (SD=0.98) in the control group, with a t-value of 36.46 (significant at 0.05).

This confirms the effectiveness of computer-assisted instruction.

IMPLICATION FOR NURSING EDUCATION AND PRACTICE:

- **Nursing Education:**

- To raise awareness of plastic risks, incorporate environmental health subjects into nursing curricula.
- In nursing education, embrace computer-assisted instruction (CAI) as a successful teaching strategy.
- Encourage school health initiatives so that nursing students can inform students about the hazards of plastic.

- **Nursing practices:**

- Inform communities about the hazards of plastic by using digital resources and CAI. Promote laws that will limit the use of plastic in communities, hospital, and schools.
- Increase knowledge of safe plastic consumption and disposal practices to put preventive health measures into action.
- Work together with government organizations, non-profits, and educational institutions to advance environmental sustainability.

RECOMMENDATION FOR FUTURE RESEARCH:

- To improve reliability, carry out comparable research with bigger sample numbers.
- Expand the study to include rural school in order to compare the efficacy of CAI in various contexts.
- Assess knowledge retention and attitude change over the long term following CAI.
- Examine the effects of various digital learning techniques (such as virtual reality and smartphone apps).
- Provide policy suggestions for incorporating CAI into the curriculum of educational institutions.

DISCUSSION:

The results of the study demonstrate that CAI greatly enhanced student's attitudes and knowledge of the risks associated with plastic. Both group's pre-test results showed a lack of awareness, but the experimental group's post-test results showed a notable improvement. There was no discernible changes in the control group, which did not receive CAI. These results are consistent with earlier research highlighting the value of CAI in environmental education.

CONCLUSION:

In a selected urban school in Mumbai, the study's primary goal was to determine the effectiveness of computer-assisted instruction (CAI) on knowledge and attitude on the hazards of plastic use among school children. Following the intervention, the experimental group's pre-test and post-test scores showed significant improvement in both knowledge and attitude. The control group, on the other hand, demonstrated no significant improvement. Demonstrating that raising awareness through traditional method alone was not successful. According to these result, CAI is an effective teaching method for raising student's awareness and attitude concerning the risks associated with plastic. As a result, including

technology-based learning approaches into school curricula may help pupils become more environmentally conscious.

SCOPE:

- Assesses how computer-assisted instruction (CAI) affects student's attitudes and understanding of plastic hazards.
- Encourages the inclusion of digital learning resources in school curricula to raise student's awareness of environmental issues.
- Encourages school children to behave sustainably, which supports environmental health education.
- Assists in creating more effective educational initiatives to inform students about the hazards of plastic.
- It offers information that can be used to change educational institution's policies to promote more environmentally friendly practices.

KEY WORDS:

Plastic pollution, Computer-Assisted Instruction (CAI), Environmental awareness, Knowledge, Attitude, Quasi-experimental study, School children.

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