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A Study to Assess the Effectiveness of Planned Teaching Programme on Knowledge regarding Mismanagement of Plastic Waste and its Environmental Hazards among the Primary School Students in Selected Primary Schools of Kamrup District, Assam

Satri Kalita[1], Ashamani Kalita[2]

Affiliation Srimanta Sankardeva University of Health Sciences, Guwahati, Assam, India
Add - Near Assam roofing Pvt Lmt, Vill - Bonda, Narangi, Ghy, Assam - 781026
Corresponding Author Email: *satrikalita696[at]gmail.com*

Abstract: ***Plastic pollution in the environment is currently receiving global attention. Improper dumping of disused or abandoned plastic waste leads to environmental pollution. A Pre - experimental one group pretest- posttest design was adopted to assess the effectiveness of planned teaching programme on knowledge regarding mismanagement of plastic waste and its environmental hazards among the primary school students in selected primary schools of Kamrup District, Assam.86 primary school students were selected using convenience sampling technique. Self - structured knowledge questionnaire was used to collect the data. Result shows that in the pre - test majority 60 (69.7%) had moderately adequate knowledge, 6 (7%) had adequate knowledge and 20 (23.3%) had inadequate knowledge. In post - test, out of 86 respondents, 53 (61.6%) had moderately adequate knowledge, 25 (29.1%) had adequate knowledge and 8 (9.3%) had inadequate. In pre - test mean knowledge score was 12.13±1.714 and in post - test mean knowledge score was 22.47±2.151 with mean difference of 10.33. The comparison was tested using paired t test with obtained (t=36.28) was statistically significant at p<0.05 level of significant. The study revealed that area of residence was found significant association with pre - test knowledge. The study concludes that Planned Teaching Programme was effective and useful means of educating the primary school students to improve their knowledge.***

Keywords: Effectiveness, Planned Teaching Programme, Knowledge, Plastic waste, Environmental Hazards

1. Introduction

''Only we humans make waste that nature can't digest''
- CHARLES MOORE

Plastic pollution in the environment is currently receiving global attention. Pollution by bulk plastics and plastic waste is currently one of the most serious problems in aquatic ecosystems. In particular, small - scale plastic debris such as microplastics and nanoplasticshave become one of the main contributors to the pollution of freshwater and marine ecosystems. More than 300 million tons of plastic are produced annually and about 75% of all marine litter is plastic. Plastic litter is widespread in aquatic ecosystems and comes from a variety of sources. The abundance of plastics, combined with their small size and subsequent association with plankton in the water column, allows for direct ingestion by aquatic biota at different trophic levels. [1]

Plastic bags are troublesome and expensive to reuse and most end up on landfill locales where they require close to 300 years to photodegrade. They separate into small poisonous particles that sully the dirt and streams and enter the natural pecking order when creatures coincidentally ingest them. In any case, the issues encompassing waste plastic packs begins some time before they photodegrade. Our planet is turning out to be progressively polluted by our superfluous utilization of plastic packs. Enormous dark receptacle liners, plastic transporter sacks conveying promoting logos, clear sandwich packs and various different structures are dirtying our current circumstance. They're lightweight, convenient and effortlessly disposed of. Excessively effortlessly disposed of. While they were seldom found during the 60s and 70s, their use has expanded at a disturbing rate since they became famous during the 80s. Simply investigate you. Plastic packs should be visible swinging from the parts of trees, flying in the air on blustery days, settled among brambles and drifting on streams. They stop up drains and depletes making water and sewage flood and become the favorable places of microbes and microorganisms that cause sicknesses. [2]

2. Literature Survey

Plastic sacks fill numerous functional needs however their utilization is inordinate. In 2006, Singapore was utilizing roughly 2.5 billion plastic sacks a year, which was identical to 1.7 packs per individual every day, practically twofold the normal number in other first world nations like the United States. Because of their exorbitant use and public littering, they are tracking down their direction into Singapore's green spaces and streams, unfavourably influencing its natural life and changing our biological systems to a level that might require a very long time to comprehend. Legislatures from

around the world are putting away cash and assets to attempt to limit their adverse consequences through new regulation. [3]

The average Indian uses one kilogram of plastic per year, the global annual average is an alarming 18 kg. But too many people do it because our cities have 4 huge inhabitants. The country has yet to take the issue seriously and has a nationwide uniform law for indiscreet plastic disposals. People should be educated on the proper ways to use and dispose of plastic. [4]

Prasad DG, Oliver J, Gopichandran M (2020) carried out a study to assess the effectiveness of structured teaching programme on the knowledge of hazards of plastic use among school children and to associate the knowledge of plastic use with socio - demographic variables. The mean pre - test knowledge score revealed that 11 (22%) had good knowledge, 30 (60%) had average knowledge, and 9 (18%) had poor knowledge and a maximum of 96% (48) of the study subjects had good knowledge in the post test. The post test knowledge score was significantly higher at 0.05 level of significance than the pre test knowledge score of the paired t - test at df (49) = 17.91 $p< 0.05$. The finding showed that assessed the knowledge of school children regarding plastic use and found that only 40% (20) had good knowledge while the rest of the study subjects had either average or poor knowledge in the pre - test and a maximum of 96% (48) of the study subjects had good knowledge in the post test. It showed that there was a significant improvement in the knowledge of school children after the teaching programme. [5]

Objectives

1) To assess the level of knowledge regarding mismanagement of plastic waste and its environmental hazards among primary school students in selected primary schools of Kamrup District, Assam.
2) To evaluate the effectiveness of planned teaching programme on knowledge regarding mismanagement of plastic waste and its environmental hazards among primary school students in selected primary schools of Kamrup District, Assam.
3) To find out the association between the pre - test level of knowledge regarding mismanagement of plastic waste and its environmental hazards among primary school students with selected demographic variables.

Hypothesis

Hypothesis are tested at 0.05 Level of Significance

H_1: There is a significant difference between the pre - test and post - test knowledge towards the mismanagement of plastic waste and its environmental hazards among Primary school students.

H_2: There is a significant association between the pre - test level of knowledge regarding mismanagement of plastic waste and its environmental hazards and with selected demographic variables.

3. Methodology

The research approach adopted for the study was quantitative approach and the research design adopted was pre - experimental, one group pre - test post - test research design. Non - probability purposive sampling technique was used to select 86 primary school students. Self - structured knowledge questionnaire was used to collect the data. The study was conducted after getting approval from the institutional ethical committee. Formal permission was obtained from the the Principal of Gobardhan M. E. School, Gobardhan and SankardevSishuNiketon, Hajongbari, Kamrup District.

The study subjects were assured for confidentiality of the data obtained. Informed consent was taken before conducting the study. Using convenience sampling technique, 86 participants were selected for the study.

Tools used:

Based on the problem statement, objectives and operational definitions of the study, the tool was developed to gather the data. The tool for collecting data was a self structured questionnaire consisting of two - Section - A, Section - B.

Section A: Demographic Profile

A self - structured questionnaire was prepared to collect background information regarding demographic variables which includes, age, sex, religion, father's education, mother's education, father's occupation, mother's occupation, area of residence, family income and source of information.

Section B: Self - structured Questionnaire

The tool was developed among the primary school students. A self structured questionnaire was constructed on knowledge regarding mismanagement of plastic waste and its environmental hazards among the primary school students. This section consisted of 25 items (MCQs) on knowledge regarding mismanagement of plastic waste and its environmental hazards.

4. Results/ Discussion

Table 1 depicts the Frequency and percentage distribution of primary school students according to demographic variables, where it shows that Majority of the primary school students belongs to age group 13 - 14 years 50 (58.1%), out of 86 primary school students 48 (55.8%) were female. Regarding educational status, majority 31 (36%) belongs to Class VII, regarding fathers educational status majority number i. e.34 (39.5%) were middle school certificate and mothers educational status the majority number i. e.30 (34.9%) were primary school certificate. Majority number of primary school students 57 (66.3%) fathers occupation were Skilled agricultural/ fishery workers and mothers occupation were belongs to majority number i. e.54 (62.8%) were unemployed. The primary school students majority were residence of rural area 69 (80.2%). Majority number i. e.30 (34.9%) out of 86 primary school students had family income of Rs.30, 831 - 46, 128. Majority number i. e.37 (43%) reported the source of information as print media.

Section I

Table 1: Frequency and percentage distribution of primary school students according to demographic variables. **n= 86**

S. No.	Demographic data	Frequency	Percentage
1.	**Age in years**		
	a. Below 13 years	36	41.9
	13 - 14 years	50	58.1
	Above 14 years	0	0
2.	**Sex**		
	Male	38	44.2
	Female	48	55.8
3.	**Educational status**		
	Class VI	27	31.4
	Class VII	31	36
	Class VIII	28	32.6
4.	**Father's educational status**		
	Profession or honours	0	0
	Graduate	4	4.7
	Intermediate or diploma	12	14
	High school certificate	18	20.9
	Middle school certificate	34	39.5
	Primary school certificate	18	20.9
	Illiterate	0	0
5.	**Mother's educational status**		
	Profession or honours	0	0
	Graduate	0	0
	Intermediate or diploma	0	0
	High school certificate	10	11.6
	Middle school certificate	25	29.1
	Primary school certificate	30	34.9
	Illiterate	21	24.4
6.	**Father's occupation**		
	Legislator/senior officials	0	0
	Professionals	0	0
	Skilled workers/ shop/ market workers	29	33.7
	Skilled agricultural/ fishery workers	57	66.3
	Unemployed	0	0
7.	**Mother's occupation**		
	Legislator/senior officials	0	0
	Professionals	0	0
	Skilled workers/ shop/ market workers	6	7
	Skilled agricultural/ fishery workers	26	30.2
	Unemployed	54	62.8
8.	**Area of residence**		
	Urban	17	19.8
	Rural	69	80.2
9.	**Monthly family income**		
	Rs ≥ 123, 322	0	0
	RS 61, 663 - 123, 321	0	0
	Rs 46, 129 - 61, 662	10	11.6
	Rs 30, 831 - 46, 128	30	34.9
	Rs 18, 497 - 30, 830	27	31.4
	Rs 6, 175 – 18, 496	14	16.3
	Rs ≤ 6, 174	5	5.8
10.	**Previous knowledge**		
	Yes	86	100
	No	0	0
10 (a)	**source of information (If yes)**		
	Mass media	31	36
	Print media	37	43
	Family members / relatives	0	0
	Others	18	21

Section II - (a)

Table 2depicts the frequency and percentage distribution pre - test and post - test level of knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards. Results revealed that in pre - test majority 60 (69.7%) of participants had moderately adequate knowledge, 20 (23.3%) had inadequate knowledge and 6 (7%) had adequate knowledge where as in post - test majority 53 (61.6%) of participants had moderately adequate knowledge, 25 (29.1%) had adequate knowledge and 8 (9.3%) had inadequate knowledge regarding mismanagement of plastic waste and its environmental hazards.

Table 2: Frequency and percentage distribution of pre - test and post - test level of knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards. **n=86**

Level of knowledge	Pre - test		Post - test	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Inadequate knowledge	20	23.3	8	9.3
Moderately adequate knowledge	60	69.7	53	61.6
Adequate knowledge	6	7	25	29.1

Section II - (b)

Table 3 depicts the post - test mean percentage scores in all areas of the planned teaching programme were higher than the pre - test mean percentage score. The maximum modified gain scores (0.89) were in the area VI. Area VI on prevention of plastic waste and minimum modified gain (0.83) was in area V on effect of plastic use on environment. Since the modified gain in all areas were higher than 0.5 it can be concluded that there was gain in knowledge in all areas.

Table 3: Findings related to area wise pre - test and post - test mean percentage knowledge score, mean percentage actual gain score and modified mean percentage gain score of the primary school students on knowledge regarding mismanagement of plastic waste and its environmental hazards, **n=86**

Selected Area	Mean Percentage		Gain in Score		
	Pre - test (%)	Post - test (%)	Actual gain	Possible gain	Modified gain
Area I	54	88	34	37.3	0.87
Area II	45	90	45	49.6	0.85
Area III	45	90	45	50.5	0.84
Area IV	45	86.7	41.7	45.2	0.85
Area V	45	85	40	46.4	****0.83**
Area VI	51.7	85	33.3	34.8	***0.89**

*Areas of maximum modified gain
** Areas of minimum modified gain

Section III

Table 4 showed that the effectiveness of planned teaching programme on knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards. Findings showed that in pre - test mean knowledge score was 12.13±1.714 and in post - test

mean knowledge score was 22.47±2.151 with mean difference of 10.33. The mean difference between pre - test and post - test knowledge score was tested using paired t test with obtained (t=36.28) was statistically significant at p<0.05 level of significance. Hence hypothesis H1 is accepted.

Table 4: Effectiveness of planned teaching programme on knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards, **n= 86**

Level of knowledge	Mean	SD	Mean Difference	t test value	df	p value	Remark
Pre - test	12.13	1.714	10.33	36.28	85	0.001	S
Post - test	22.47	2.151					

S= Significant, t (0.05, 85 df) = 2.00, p value= 0.001

Section IV

Table 5 depicts the association between pre - test knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards with their demographic variables, which was tested by using chi - square test. Results showed that area of residence was found significant association at p<0.05 level with pre - test knowledge but demographic variables such as age, sex, educational status, father education, mother education, father occupation, mother occupation, family income and source of information were non significant at p<0.05 level with pre - test knowledge regarding mismanagement of plastic waste and its environmental hazards among primary school students. Hence hypothesis H_2 is rejected.

Table 5: Association between the pre - test level of knowledge of primary school students regarding mismanagement of plastic waste and its environmental hazards with their selected demographic variables, **n=86**

Demographic variables	Pre - test knowledge			χ^2 Value	df	p value
	Inadequate	Moderately adequate	Adequate			
Age in years						
a. 13 - 14 years	8	26	2	0.261	2	0.878^{NS}
b. 15 - 16 years	12	34	4			
Gender						
a. Male	9	26	3	0.105	2	0.949^{NS}
b. Female	11	34	3			
Educational status						
a. Class VI	7	18	2	1.933	4	0.748^{NS}
b. Class VII	6	24	1			
c. Class VIII	7	18	3			
Father's education						
a. Profession/ honours	- -	- -	- -	7.907	8	0.443^{NS}
b. Graduate	1	3	0			
c. Intermediate school	2	8	2			
d. High school	4	14	0			
e. Middle school	10	20	4			
f. Primary school	3	15	0			
g. Illiterate	- -	- -	- -			
Mother's education						
a. Profession/ honours	- -	- -	- -	2.736	6	0.841^{NS}
b. Graduate	- -	- -	- -			
c. Intermediate school	- -	- -	- -			
d. High school	3	7	0			
e. Middle school	4	18	3			
f. Primary school	8	20	2			
g. Illiterate	5	15	1			
Father's occupation						
a. Legislator, Senior officials & Managers	- -	- -	- -	0.168	2	0.919^{NS}
b. Professionals	- -	- -	- -			
c. Skilled workers and shop & Market sales worker	6	21	2			
d. Skilled agricultural and fishery workers	14	39	4			
e. Unemployed	- -	- -	- -			
Mother's occupation						
a. Legislator, Senior officials & Managers	- -	- -	- -	8.935	4	0.063^{NS}
b. Professionals	- -	- -	- -			
c. Skilled workers and shop & Market sales worker	0	4	2			
d. Skilled agricultural and fishery workers	5	19	2			
e. Unemployed	15	37	2			
Area of residence						
a. Urban	1	12	4	11.07	2	0.004*
b. Rural	19	48	2			
Monthly family income						
a. Rs. ≥123, 322	- -	- -	- -	10.48	8	0.232^{NS}

b. Rs.61, 663 - 123, 321	- -	- -	- -			
c. Rs.46129 - 61, 662	3	7	0			
d. Rs.30, 831 - 46, 128	5	24	1			
e. Rs.18, 497 - 30, 830	6	16	5			
f. Rs.6, 175 - 18496	5	9	0			
g. Rs. ≤6174	1	4	0			
Source of information						
a. Mass media	7	22	2	2.302	4	0.680^{NS}
b. Print media	8	25	4			
c. Family members	- -	- -	- -			
d. Others	5	13	0			

*p<0.05 level of significance NS - Non significant

5. Conclusion

Plastic pollution is capable of affecting land, waterway and oceans as a large percentage of marine and land creatures have died due to the fact that plastic is non - biodegradable and it causes hazards to soil. Plastic pollution causes harm to humans, animals and plants through toxic pollutants. It can take hundreds or even thousands of years for plastic to break down, so the environmental damage is long - lasting. It affects all organisms in the food chain, from tiny species like plankton to whales. Once primary school students have good knowledge about the management of plastic waste and its environmental hazards they will adopt good practice in plastic use and waste management. The present study was undertaken to assess the effectiveness of planned teaching programme on knowledge regarding mismanagement of plastic waste and its environmental hazards among the primary school students in selected primary schools of Kamrup District, Assam. The study adopted pre - experimental, one group pre - test post - test research design. The findings of the study will help the school health nurse can plan, implement and evaluate various teaching programmes regarding mismanagement of plastic waste and its environmental hazards among the primary school students. The nurse can co - ordinates with other health team members and conduct awareness programme to primary school students in community.

6. Future Scope

The study can be done in different settings. The same study can be done on a large sample for more valid generalization.

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Author Profile

Ms. SatriKaita, MSc Nursing, Community Health Nursing - CPMS College of Nursing, Guwahati, Assam. BSc Nursing - Asian Institute of Nursing Education, Guwahati, Assam.

Mrs. Ashamani Kalita, Assistant Professor, MSc in Community Health Nursing - CPMS College of Nursing, Guwahati, Assam.