

Effect of health educational program about plastic use hazards on knowledge, attitude and practice of preparatory school teachers

Nahla Said Mahmoud¹, Ebrahim Ali Kabbash², Hend Reda Ali El-kest³

^{1,3}Lecturer of Community Health Nursing, Faculty of Nursing, Tanta University, Egypt

² Professor of Public Health and Community Medicine, Faculty of Medicine, Tanta University, Egypt.

Abstract; Plastic materials were initially designed to improve our quality of life. However, their unregulated usage has resulted in a variety of environmental and health problems due to a lack of knowledge about their fate in living beings and the ecosystem. **This paper aimed to** evaluate an effect of a health education program about plastic use hazards on knowledge, attitude and practice of preparatory school teachers. **Methodology;** quasi-experimental design was applied in the research; it was done in four Preparatory governmental schools that affiliated to the Ministry of Education in Egypt. A well-structured questionnaire was used in this study for data collection. **Results;** there was a statistically significant improvement in all items of knowledge, practice, and attitude regarding plastic usage and its hazards before and 3 months after educational intervention as $p=0.001$. **Conclusion and recommendation;** the educational intervention was successful in enhancing knowledge, practice, and attitude of the studied teachers toward the risks associated with plastic use. School health nurse should provide educational intervention in different schools to improve the information of teachers and students about the risks of plastic use. Imposing tax on plastic products by the government, especially with fewer microns and non-recyclable plastic products.

Keywords: Plastic, Health educational program, Teachers.

Introduction

There is a developing frame of proof concerning the presence of poisonous pollution within the environments, and the health effects of these pollutants on humans. Plastic products have emerged as a necessary part of the day by day existence worldwide. Plastic is broadly used because of its low price and specific practical properties however it has many intense destructive results on human's wellness and health either or direct and indirect methods. Plastic products

pollute the environment and threaten human life. So, there was an extraordinary want to lessen plastic use and plastic waste hazards. Hence, there is a need to assess the level of information regarding hazards of plastic use, especially on health among community people. A theme of World Environmental Day (5 June, 2018) was "Beat plastic pollution" All the world was banded together to prevent plastic pollution⁽¹⁾.

Plastics are considered a significant problem all over the world. Plastics are used on a day by day foundation throughout the world. Globally there's the manufacturing of one hundred fifty million lots in keeping with year. It operates extra than 30,000 processing units. Packaging represents the single-biggest quarter of plastics use (35% of plastic consumption). Unintended poisoning which includes chemical poisoning (publicity to acids, detergents, plastic waste, and toxic gases) kills 350, 000 human beings globally⁽²⁾.

Plastic is considered an environmental hazard that is producing possible threats to the surrounding and adverse effects on human health. Plastic materials are used widely; due to its low cost and wide range of functional flatteries, yet it has a number of serious negative health consequences on persons. Plastic is made from plasticizers that are used to sell plasticity and versatility in plastic materials. Major components of plastic such as (polyvinyl chloride, dioxins and plasticizers) are included in many materials such as toys, food containers and plastic wraps. They can cause major health problems e.g. hormonal imbalance, reproductive problems, breast and testicular cancer, and bronchial allergies in children. During pregnancy, the plastic chemicals can cause adverse developmental effects on the fetus consisting of decreased survival, low beginning weight, behind schedule boom of offspring and of puberty. It has also a potential to lower IQ for a developing fetus⁽³⁾.

The plastic bag use is very common amongst community. Most people are

that some plastic materials as bags included polymers and chemical substances as lead, cadmium, mercury and carcinogens that are toxic and the direct contact with these materials for long time can lead to serious effects. Most people are unaware of the aftermath occurring because of using plastic bags. The plastic bags contain polymers and chemical toxins like lead, cadmium, mercury and carcinogens and the direct contact with these substances over a long period can lead to serious consequences. So there is a great need to raise awareness concerning plastic hazards. To lessen the plastic use consumption, it is necessary to teach the general public via different educational strategies⁽⁴⁾.

Significance of the study; the increase in consumption of plastic products and its negative impacts on health put urgency to this problem. Since in 1800s, the industrial revolution has been raised and it leads to increase the plastic pollution. According to World Health Organization (WHO 2022) plastic accounts for 10% of all of the waste we generate. Every year, close to five hundred billion plastic bags are used around the world.

Above eight million tons of plastic wind up in the oceans every year, the equivalent of a full garbage truck every minute. To offer favored surroundings many moves must be taken with the aid of using fitness experts which include interactive and powerful lectures in the educational systems and encouraging its stability throughout the life is important. Egypt provided six million metric heaps of plastic every year, making it the most important

plastic polluter within side the Arab world. World Wildlife Fund (WWF) reported in 2019 that Egypt also contributes the most plastic pollution among Mediterranean countries, at 250,000 tons each year ⁽²⁾.

Burning of plastic made things such as (tubs, dishes, pipes, polythene bags etc.) cause toxic smoke with dangerous chemicals. By burning of plastic dioxin and styrene gas produces which can lead to hormonal disruption and cancer of different organs in a human being. These chemical substances are risky for not only us, additionally for burners and neighbors. So, it is a great importance to lessen plastic use to prevent its hazards. For this purpose education is extremely important factor as education has potential to change people's knowledge, attitude and conduct toward this issue. Teachers are the best to spread the correct information to their students and their families as a type of community involvement. They could educate students about the hazards of plastic materials. ⁽⁵⁾

Community health nurses have a vital role in influencing knowledge, attitudes, and behaviors of the community related to health promotion and sickness prevention via their role in schools, home care, maternal and child health care centers and different community care settings. Community health nurse taking an active role in the planning, implementation, and evaluation of comprehensive educational programs depended on a theoretical framework to improving the health of society, motivating them, also, discovering unhealthy habits and modifying them through nursing care

plans. So, this research aimed to determine the effect of a health education program about plastic use hazards on knowledge, practice, and attitude of preparatory teachers ⁽⁶⁾.

Research Aim

Determine the effect of a health education program on knowledge, practice, and attitude regarding plastic usage and its hazards among preparatory teachers.

Research hypothesis

A significant improvement will be expected to occur in levels of knowledge, practice, and attitude of the studied preparatory teachers regarding hazards of plastic usage between the pre-test and post-test of a health education program.

Subject & Methods Research design; Quasi-experimental design was utilized in this study by using a pre and post-test stage.

Research setting; It was carried out in four Preparatory governmental schools that affiliated with the Ministry of Education in Egypt and they serve in El_gharbia and Kafr Elshiek governorate. These schools have been selected by convenience sampling technique in which easy to reach by the researchers. The researchers chose two schools to represent the rural community and two schools represent the urban one. two schools in a rural area and two schools in an urban one .

Subjects: a convenient sample of 200 teachers has been selected from the previous settings for data collection and application of the health education program. 100 teachers from the rural

community (50 from rural community in Kafr Elshiekh governorate and the same from rural community in El_Gharbia governorate); on the other hand (50 from urban community in Kafr Elshiekh governorate and the same from urban community in El_Gharbia governorate).

Inclusive criteria; the teachers were selected according to the following criteria; male or female teachers, free from lecture at the time that the researchers reached the schools, who were willing to included in the research, and teachers that worked in urban schools were lived in urban community and vice versa.

Sample size calculation; it was calculated using equation of the power analysis based on the level of significance (95%), study power (80%), level of knowelge from pre to post educational intervention (70-80%), with margin of the error (5%). It was calculated to be 180 teachers and the researchers increased to 200 teachers to increase validity of the reserch.

Research period; three months (October 2021- December 2021)

Research tool; A well-structured questionnaire was used in this study after reviewing recent and relevant literature to collect the data from the sample and it consisted of four parts was developed by the researchers according to literature review^(7,8).

Part I; Socio-demographic characteristics of the study subjects. This part contained data as age, sex, residence, place of school, marital status, monthly income, education level, experience years, and family type.

Part II; Knowledge of the study subjects about plastic usage and its hazards⁽⁷⁻¹⁰⁾.

It was prepared by the researchers to evaluate the teachers` level of knowledge about plastic usage and its hazards. This part was included ten questions in form of true or false or don`t know) and seven questions in the form of selecting the correct answer. All the answers were coded .A score of 2 was giver for correct answers, 1 for wrong responses, and marked zero for don`t know. The range knowledge scoring was 0 to 34 points and it was dividied into good if the score is above 65% (above 22), fair with a score of 50-65% (17-22) and poor with a score of less than 50% (<17).

Part III; Attitude of the study subjects about plastic usage and its hazards^(8,11).

It was compromised on 9 statements that measure teachers' attitude toward plastic use and its hazards in the form of a Likert three-point rating scale (Agree3,neutral2, and disagree1) except statement 7 was reversed. A total grade of the scale was converted into a percentage score and it was classified into negative attitude $\leq 70\%$ and positive attitude $> 70\%$ of the total grade of the attitude.

Part IV; Using of plastic materials by teachers⁽¹²⁻¹⁴⁾.

The total number of questions in this part was 5 questions. It was included the following statements that assess using teachers of plastic materials, types of plastic material used, causes for using, frequency of its use, places for elimination plastic materials. The teacher answered by yes had scored (1) or no had scored (0). The total score of

(yes) answer indicated unsatisfied practices and the total score of (no) answer indicated satisfying practices.

Administrative considerations; A formal written letter of permission to initiate the research was obtained from the dean of the Faculty of Nursing to the managers of educational administration in Santa and Kafr elshiek city and then to the managers of the selected schools with informed them about the aims of the study.

Ethical considerations; The permission was obtained from the research ethics committee for conducting the study. Research Committee, Tanta University was obtained with code number (132-11-2022). Every teacher was informed about the aim, nature, and benefits of the research at the beginning of the interview and they had the right to withdraw from the study at any time. written consent was obtained from the studied sample to participate in the study after an explanation of its goals. Privacy and confidentiality were regarding the collected data put into consideration.

Developing the tool; study tool with all parts was prepared by the researcher according to recent, relevant, and related literature review then translated into the Arabic language. Also, it was tested for content validity by a jury of six experts in the field of community health nursing and public health. (Three professors of Public Health at the Faculty of Medicine and three professors of Community Health Nursing at the Faculty of Nursing, Tanta University), these professors calculated an average total percentage of their acceptance of the study tool

that varied from 90-95%. The study tools were assessed for their reliability using Cronbach's alpha test and re-test through distributing tools to 20 teachers (pilot study) two times separated by two weeks. The reliability statistics of all parts (0.987)

A pilot study; it was done on 20 teachers for testing the tools for their clarity and applicability and the length of time needed to collect the needed data from each student. This sample was excluded from the actual study. The necessary modifications were done by restating some questions and deleting others.

The actual study; The researchers interview the teachers in their desks or school theater in their free time during the school day according to the date and time specified by the managers. The researchers mostly divided the teachers into two groups; each group consisted of 20-25 teachers. The total number of groups in the four selected schools was about 8 groups. The researchers were available two days/week to collect the data and to implement the educational program. The average number of sessions/day was two sessions. The duration of each session was ranged from 25 - 30 minutes. Study tools were administered individually to each teacher with the attendance of the researchers to offer guidance when needed. Data was collected over six months starting from the beginning of March 2022 until the end of August 2022.

Developing the educational program; It included four phases, Assessment phase; the researcher in this phase assessed the level of

knowledge, attitude, and practices of teachers toward using plastic use and its hazards through the distribution of a questionnaire sheet before implementation the program and also, to stressed on needs of teachers in this topic. Planning phase; according to the previous phase and teacher`s needs; the researchers have planned an educational program and the goal of implementing the program was stated. Implementation phase: The program consisted of four sessions provided for the teachers. The four sessions were implemented as follows; session one was Program orientation and teachers' expectation about the educational program, session two was a definition, components of plastic materials causes, types of plastic use, session three was negative effects and hazards of plastic use, and session four was provided alternatives and preventive methods of plastic use.

Teaching methods& teaching aids; Lectures, group discussion, brainstorming, and role modeling were used as teaching methods. Power point presentations, videos, stories, and handouts were used as teaching aids.

Evaluation phase; this phase was aimed to evaluate the outcome of the educational intervention program. The evaluation was done two times as follows: The first time: before the education program intervention using a tool (I). The second time: three months after the education program implementation using a tool I part (II, III, IV).

Statistical analysis;

SPSS software statistics computer programme version 21 was used to arrange, tabulate, and statistically

analyses the acquired data. The range, mean, and standard deviation were determined, and the Chi-square test (2) and Kruskal-Wallis H descriptive statistics were used for comparison. Pearson and Spearman's correlation coefficient r were used to assess the correlation between variables. A significance was adopted at $P < 0.05$ for interpretation of results of tests of significance (*).

Results

The socio-demographic characteristics of the studied sample. The table shows that, the studied participants` age ranged between 22-60 years, with a mean age of 38.28 ± 9.81 years, and more than two thirds of the studied participants were females, married, and lived with the nuclear families. Also, (61.5% and 62.0%) of them had enough income and a university educated respectively. Moreover; less than one- third (30%) of them had less than 10 years of experience. (Table 1)

Knowledge of the study participants about plastic usage and its hazards throughout the study phases. The table shows that, an improvement with a statistically significant was presented in all items of knowledge related to plastic usage and its hazards of studied participants before and 3 months after the educational program as $p = 0.001$. (Table 2)

Attitude of the study participants about plastic usage and its hazards throughout the study phases. It founded that, there was improvement with a statistically significant in all items of attitude regarding plastic usage and its hazards of studied Participants before and 3 months after

educational intervention as $p=0.001$.

(Table 3)

The study participants practices using plastic products throughout the study phases. It observes that, there was a statistically significant improvement in all items of plastic products usage practices among studied Participants before and 3 months after educational intervention as p less than 005. **(Table 4)**

Correlation between age, experience, educational level of the study participants, and change in their knowledge and attitude after the intervention; It reveals that, there was negative correlation with a significant among the knowledge and attitude change of the studied sample and their age and years of experience. Also, there was a positive significant correlation between the attitude change of the studied sample and their educational level as $P < 0.001$. **(Table 5)**

Characteristics of study participants in relation to using plastic products after intervention. It observes that there was a relation between studied samples` age, their education level, and using plastic products as P less than 0.5. **(Table 6)**

Information sources of the studied teachers about plastic usage and its hazards. The majority of the study participants` main source of information about plastic usage was professional persons. **(Figure 1)**

Table (1): The socio-demographic characteristics of the studied sample

Variables	Number (n=200)	%
Age in years:		
20-	35	17.5
30-	76	38.0
40-	50	25.0
50-60	39	19.5
Range	22-60	
Mean+SD	38.28+9.81	
Sex:		
Males	64	32.0
Females	136	68.0
Marital status:		
Single	21	10.5
Married	170	85.0
Divorced/widow	9	4.5
Monthly income:		
Enough	123	61.5
Not enough	77	38.5
Educational level:		
High institute	27	13.5
University	124	62.0
Master degree	39	19.5
Doctor degree	10	5.0
Years of experience:		
<10	68	34
10-	60	30.0
20-	54	27.0
30+	18	9.0
Range	1-36	
Mean+SD	15.19+9.64	
Family type:		
Nuclear	137	68.5
Extended	59	29.5
One parent family	4	2.0

Table 2: knowledge of the study participants about plastic usage and its hazards.

Items of knowledge	Before		After		Z*
	n	%	n	%	
All plastic products are not usable	54	27.0	111	55.5	8.474
Plastic is made from petroleum derivatives as well as some chemicals	73	36.5	151	75.5	7.940
The use of plastic leads to the death of all living things	18	9.0	131	65.5	11.016
There are viable alternatives to plastic bags	77	38.5	189	94.5	9.484
Correct disposal of plastic waste through recycling	78	39.0	175	87.5	8.892
Plastic waste is one of the reason of environmental pollution	110	55.0	188	94.0	7.968
Plastic products are biodegradable and shaped into different shapes	79	39.5	172	86.0	8.700
Plastic products are a cause of miscarriage and birth defects	68	34.0	186	93.0	9.791
Plastic materials rust and biodegrade and remain in the environment for long periods	40	20.0	170	85.0	10.332
Plastics hardly degrade	68	34.0	155	77.5	8.830
Types of plastic products	87	43.5	140	70.0	5.619
Duration of decomposition of plastic	39	19.5	142	71.0	9.131
Cause of plastic pollution	49	24.5	191	95.5	11.114
Problems associated with plastic pollution	64	32.0	189	94.5	10.195
Methods of limiting use of plastic	50	25.0	173	86.5	10.370
Ecofriendly alternative of plastic bags	64	32.0	185	92.5	9.974
Adverse health effects of plastic on human health	47	23.5	172	86.0	10.492

*All Z values are significant at $p=0.001$, ** $p = 3.17$

Table (3): Attitude of the study participants about plastic usage and its hazards throughout the study phases.

Items of attitude	Before		After		Z*
	n	%	n	%	
Lack of awareness of the danger of using plastic is the reason why people rely on it	96	48.0	173	86.5	9.035
Plastic is harmful to health, the environment and fish	67	33.5	195	97.5	10.254
Are you willing to reduce your use of plastic products	40	20.0	160	80.0	9.900
I prefer to bring hot food in plastic containers	64	32.0	196	98.0	10.292
I teach my children (brothers) to use glass cups	42	21.0	172	86.0	11.193
I think the low price of plastic products is one of the reasons for its spread	69	34.5	195	97.5	10.056
There is alternative used other than plastic products	0	0.0	184	92.0	12.537
I think that plastic is harmful to health because it does not decompose easily	37	18.5	174	87.0	11.370
I think that plastic is harmful to health because it is made of petroleum derivatives	45	22.5	200	100	11.150

*All Z values are significant at p=0.001

Table (4): The study participants' practices in using plastic products throughout the study phases .

Items of practices	Before		After		Z	p
	n	%	n	%		
Frequently using plastic materials	200	100	123	61.5	8.775*	0.001
Plastic products uses:						
Plastic bags only	184	92.0	91	45.5	9.347*	0.001
Plastic bottles only	141	70.5	34	17.0	9.349*	0.001
Household appliances	67	33.5	10	5.0	7.070*	0.001
All of the above	184	92.0	63	31.5	10.572*	0.001
Disposing plastic waste:						
Burning	87	43.5	10	5.0	7.818*	0.001
Burial	87	43.5	60	30.0	2.929	0.003
Recycle	74	37.0	148	74.0	6.755*	0.001

*All Z values are significant at p=0.001

Table (5): Correlation between age, experience, educational level and change in knowledge and attitude of the study participants after the intervention

Variables	Knowledge change		Attitude change	
	r/rho	p	r/rho	p
Age in years	-0.342	<0.001	-0.355	<0.001
years of experience	-0.282	<0.001	-0.325	<0.001
Educational level	0.156	0.027	0.353	<0.001

* significant at p<0.001

Table (6): Characteristics of the study participants in relation to using plastic products after intervention.

Variables	Not using plastic products		Using plastic products		X ²	p
	n	%				
Age in years:					0.439	0.508
<40	45	40.5	66	59.5		
40+	32	36.0	57	64.0		
Sex:					0.179	0.672
Males	26	40.6	38	59.4		
Females	51	37.5	85	62.5		
Residence:					3.569	0.059
Rural	45	45.0	55	55.0		
Urban	32	32.0	68	68.0		
Marital status:					10.184	0.006*
Single	14	66.7	7	33.3		
Married	62	35.6	108	63.5		
Divorced/widow	1	11.1	8	88.9		
Monthly income:					0.037	0.847
Enough and saving	48	39.0	75	61.0		
Not enough	29	37.7	48	62.3		
Educational level:					11.0402	0.003*
High institute	6	22.2	21	77.8		
Bachelor	59	47.6	65	52.4		
Master degree	9	23.1	30	76.9		
Doctor degree	3	30.0	7	70.0		
Years of experience:					1.137	0.286
<15	46	41.8	64	58.2		
15+	31	34.4	59	65.6		
Family type:					MCET	0.136
Nuclear	59	43.1	78	56.9		
Extended	17	28.8	42	71.2		
One parent family	1	2.5	3	75.0		

*Significant MCET = Monte Carlo Exact Test

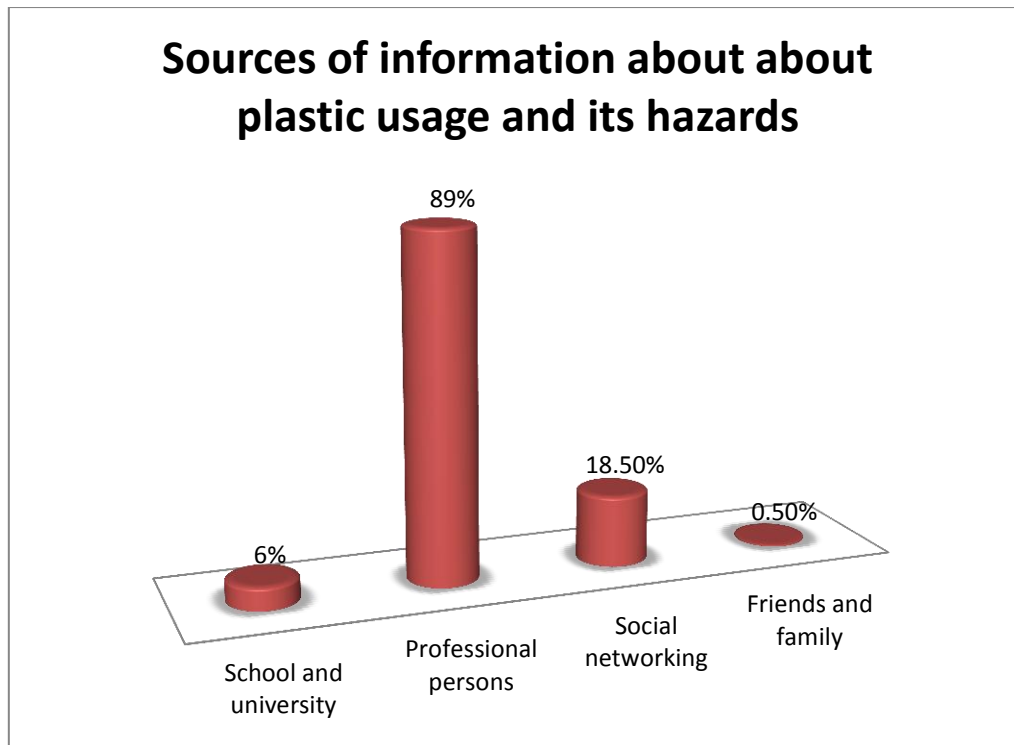


Figure 1: Information sources of the study participants about plastic usage and its hazards.

Discussion

Yearly million tons of plastic waste polluted seas, oceans, and rivers and it damaged whales, fish and other sea creatures. Plastic waste has a negative effects on humans, animals, birds, and etc included impaired immune function, kidney and liver failure, improper lung function, obese and diabetes, eye, nose, and throat discomfort ⁽¹⁵⁾. Therefore, there is a great need to increase awareness among Egyptian community for adequate disposal and recycling of plastic waste which achieves the aim of the research. So the aim of this study was to determine the effect of a health education program on knowledge, practice, and attitude regarding plastic usage and its hazards among teachers.

The current study revealed that the studied participants' age ranged between 22-60 years, with a mean age of 38.28+9.81 years, and more than two thirds of the studied teachers were females, married, and lived with the nuclear families. Also, (61.5% and 62.0%) of them had enough income and were university education respectively. Moreover; nearly one third of them had less than 10 years of experience. These findings is similar to Nisha P,(2017) ⁽¹⁰⁾ who assessed (the effectiveness of video assisted teaching on knowledge regarding ill effects of plastic usage among homemakers at Chennai) and found that less than a quarter of the studied participants were in the age group of 40 years, more than one third of the studied participants were in the age group of 31-40 years and 41% of the studied participants were aged 30 years. Also regarding that a quarter of the studied

participants had education up to degree, more than half of them had education up to 1-12thstd and more than quarter of them had no formal education. Also nearly one third of them were in joint family and more than two thirds of them were in nuclear family, more than half of them had enough income ⁽¹⁰⁾.

The finding of this study was in disagreement with **Chitrakshi, et al.,(2019)** who assessed the awareness regarding hazards of plastics among adults and mentioned that majority of participants were male, half of them were graduates with mean age 30years⁽⁴⁾ Furthermore, the current research showed a significant statistical improvement in all items of knowledge related to plastic usage and its hazards of studied participants before and after the educational intervention. This improvement may be attributed to attending the educational program. This result was in the same line with the research conducted by **Nisha P,(2017)**⁽¹⁰⁾ who reported that, the study participants were having 42.5% of knowledge score on the ill effects of plastics usage before intervention while, after intervention they were having high level of information score regarding topic. In the same line **Pushpakala K (2017)** ⁽¹⁶⁾ who reported that the mean score after intervention was higher than the mean score before intervention. This result was in contrast with the study conducted by **Chitrakshi, et al.,(2019)** (**Nisha P, 2017; Pushpakala K 2015; Chitrakshi 2019**) ^(4,10,16).

Concerning the studied teacher's practices using plastic products among the study phases. This study was

presented that there was a significant statistical improvement in all items of practices regarding plastic products usage of studied Participants before and 3 months after an educational intervention. This result was similar to the study of **Srinivasan, et al., (2019)** who assessed the knowledge and practice on plastics among students and reported that more than one third of the participants had a moderate level of practice and slightly less than one third of them had a good practice. While one third of the study subjects have reported a poor level of practice⁽¹²⁾.

Concerning the correlation between age, experience, educational level and change in knowledge, and attitude after the intervention; the current study found that, there was a significant negative correlation between the knowledge and attitude change of the studied sample and their age and years of experience. There was also a P 0.001 positive significant association between the examined sample's attitude change and their educational level. These findings were consistent with those of **Pushpakala K et al., (2017)**, who found a substantial positive connection between knowledge and demographic variables⁽¹⁶⁾. From the researcher point of view this result highlights the importance of the educational level in changing the recipient's attitude easily.

Also, these results were congruent with the research achieved by **Nisha P,(2017)** who found that there was a statistically relation between knowledge score with the age of the participants. **Chitrakshi, et al.,(2019)** in a similar study reported that there

was a significant association between the study participants' educational level and their awareness regarding the hazards of plastic bag use. But, in contrast **Chitrakshi, et al.,(2019)** ,**Vigneshwaran. R, et al., (2014)** and **Reda A (2020)** reported that there was no relation between awareness regarding hazards of plastic bag use among adults and their age, gender, and occupation^(10,4,17,18).

Conclusion; According to the findings of the present study, an educational intervention was successful in enhancing information, practice, and attitude of the studied teachers toward the risks associated with plastic use.

Recommendations; Nurse in different fields should provide educational intervention in different schools to improve the information of teachers and students about the risks of plastic materials. Imposing tax on plastic products by the government, especially with fewer microns and non-recyclable plastic products and also administrating various campaigns and awareness activities to raise awareness about hazards caused by the use of plastic materials.

References

1. Okunola A, Kehinde I , Oluwaseun A. Olufiropo, E .Public and Environmental Health Effects of Plastic Wastes Disposal: A Review, Journal of Toxicology and Risk Assessment. 2019; 5(2):1-13. DOI: 10.23937/2572-4061.1510021. Retrivedfrom:https://www.researchgate.net/publication/332559340_Public_and_Environmental_Health_Ef

- fects_of_Plastic_Wastes_Disposal_A_Review.
2. World Health Organization (WHO). 2018. World Environment Day 2018: a call to “Beat plastic pollution. Retrieved from: <http://www.emro.who.int/ceha/ceha-news/world-environment-day-2018-a-call-to-beat-plastic-pollution.html>
 3. Claudia C, Carmine M. Ilaria, S. A Detailed Review Study on Potential Effects of Micro plastics and Additives of Concern on Human Health. 2020;17(4): 1212. doi: 10.3390/ijerph17041212. Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068600/>
 4. Chitrakshi K, Shiya R. Shaji D, Sandarbh V, Anosh G. Sujita D. Assess the awareness regarding hazards of plastic bag use among adults. The Pharma Innovation Journal. 2019; 8(6): 139-143.
 5. Richard C, Thompson1. Charles J, Frederick S. Shanna H. Plastics, the environment and human health: current consensus and future trends. 2009. 364(1526): 2153–2166. doi: 10.1098/rstb.2009.0053 Retrieved from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2873021/>
 6. El-kest H, Ali E, Mahmoud N. Effect of Pender's Model-Based Educational Intervention Program on Promoting Healthy Lifestyle Practices among University Nursing Students, IEJNSR.. 2022; 2(2):1580-1594. DOI: 10.21608/ejnsr.2021.94385.1083.
 7. Abid R., Hussain M., Majeed I, Afzal M, Parveen K, Gilani S. Effectiveness of Health Education Session on Knowledge of High School Students Regarding Plastic Use and Its Health Hazards. Age, 12(13year). Journal of Health, Medicine and Nursing. 2020 ;3 (72) 68-73. DOI: 10.7176/JHMN/72-09
 8. Gabuya R. . Knowledge, attitude, & practice regarding environmental hazards of plastic use. The international Journal of environmental health and public research. 2022; 19(2):779 – 0 DOI: 10.3390/ijerph19020779
 9. Khairnar C, Shaji S , Khemnar D, Vyas S, Gadkari A, Devi S. Assess the awareness regarding hazards of plastic bag use among adults .The Pharma Innovation Journal . 2019; 8(6): 139-143.
 10. Nisha P. A Study to assess the Effectiveness of Video Assisted Teaching on Knowledge regarding Ill Effects of Plastic Usage among Homemaker s at KP Park, Chennai (Doctoral dissertation, College of Nursing, Madras Medical College, Chennai). 2017. Available at: <http://repositorytnmgrmu.ac.in/6881/1/300416317nisha.pdf>
 11. Malik H, Roy K.. A Descriptive Study to Assess the Knowledge and Attitude of Adolescents Regarding Mismanagement of Plastic Wastes and its Environmental Hazards in Selected Community Area, Nelamangala. International Journal of Science and Research (IJSR), 2017; 6(6):677-80.
 12. Srinivasan, N, Swarnapriya V, AJW F. Assessment of knowledge and practice on plastics among the professional course students of

- Annamalai University, Tamil Nadu .
International Journal of Community
Med Public Health. 2019;6(2):510-
DOI:
<https://dx.doi.org/10.18203/2394-6040.ijcmph20190099>
13. Proshad R., Kormoker T, Islam M ,
Haque M., Rahman M, Mithu, M.
Toxic effects of plastic on human
health and environment: A
consequences of health risk
assessment in Bangladesh.
International Journal of Health.
2018; 6(1):1-5 .DOI:
10.14419/ijh.v6i1.8655
 14. Abin P.. Effectiveness of peer
mediated teaching on knowledge
regarding hazards of plastic use
among school children in a selected
school, Salem (Doctoral
dissertation, Sri Gokulam College
of Nursing, Salem. 2020.Available
at: [http://repository-
tnmgrmu.ac.in/3839/1/3002217abin
peter.pdf](http://repository-tnmgrmu.ac.in/3839/1/3002217abinpeter.pdf)
 15. Kaur S , Jeganathan J, Kaur M..
Effectiveness of Structured
Teaching Program on Knowledge
regarding Health Hazards of Plastic
use among Students -A Quasi
Experimental Study. Nursing &
Healthcare International Journal.
2019;3(2): 000180
 16. Pushpakala KA study to assess the
effectiveness of video assisted
teaching on knowledge regarding
ill effects of plastic usage among
homemakers at kp.park ,chennai-03.
College of nursing madras medical
college, chennai – 03. 2017.
Available at: [http://repository-
tnmgrmu.ac.in/9557/1/300416314ge
etha.pdf](http://repository-tnmgrmu.ac.in/9557/1/300416314geetha.pdf)
 17. Vigneshwaran R., Arunkuma B..
Knowledge Attitude and Practice on
Plastic usage among the Residents
of Tiruchirappalli Municipal
Corporation, Tamil Nadu- A
Descriptive Study. IOSR Journal Of
Humanities And Social Science
(IOSR-JHSS). 2014; 12(8): 33-39.
 18. Rida A , Muhammad H , Iram M.,
Muhammad A, Kausar P, Syed A.
Effectiveness of Health Education
Session on Knowledge of High
School Students Regarding Plastic
Use and Its Health Hazards. Journal
of Health Medicine, and Nursing
www.iiste.org ISSN 2422-8419 .An
International Peer-reviewed Journal.
2020. Vol.72. DOI:
10.7176/JHMN/72-09