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A Study to Assess the Effectiveness of Planned Teaching Programme on Solid Waste Disposal in Terms of Knowledge and Attitude among Women in Selected Rural Areas of Gandhinagar District of Gujarat during year 2016

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ABSTRACT

A study to assess the effectiveness of Planned teaching programme on solid waste disposal in terms of knowledge and attitude among women in selected rural areas of Gandhinagar district of Gujarat during year 2016. Solid waste disposal in rural area is a very common within the India. Comprehensive literature review was performed to understand the current scenario and standard recommendations for solid waste disposal among women in selected rural areas. Research was based on conceptual framework of System Model theory. The data obtained were analyzed and interpreted in the light of objectives and hypotheses using descriptive and inferential statistical in terms of mean, standard deviation, 't' test, and chi- square test value. The mean post test Knowledge score 24.28 was higher than mean pre test Knowledge score 15.58 with the mean difference of 8.7 and the calculated 't' value (16.92) was greater than the tabled't' (2.00). The mean post test Attitude score 76.66 was higher than mean pre test Attitude score 68.71 with the mean difference of 7.95 and the calculated't' value (6.48) was greater than the tabled't' (2.00).

Thus, findings indicate that the Structured Planned teaching Programme was a suitable and effective method of instruction for updating and enhancing the Knowledge of women. Based on the findings, the following recommendations were offered for future research: like, it can be replicated on a large sample size, conducted in a different setting like schools, rural and urban areas done with true experimental research approach, time series studies can be conducted, different teaching strategies can be used, etc.

KEYWORDS

Knowledge, Attitude, Solid Waste Disposal, Planned teaching programme (PTP)

INTRODUCTION

"Climate change is for real. We have just a small window of opportunity and it is closing rather rapidly. There is not a moment to lose."

Human activities domestic, agricultural or industrial generate huge quantity of waste. The wastes generated from these activities of more advanced society produce more complex and heterogeneous wastes because of living standards and changing food habits. These activities are changes the quality of waste and increases quantity per capita in recent years. The solid waste problem is much more severe in urban environments.

Due to population growth, industrialization, urbanization and economic growth, a trend of significant increase in municipal solid waste (MSW) generation has been recorded worldwide. MSW generation, in terms of kg/capita/day, has shown a positive correlation with economic development at world scale. Due to rapid industrial growth and migration of people from villages to

cities, the urban population is increasing rapidly.

Waste generation has been observed to increase annually in proportion to the rise in population and urbanization. India, with a population of over 1.21 billion account for 17.5% of the world population (Census of India 2011). According to the provisional figures of Census of India 2011, 377 million people live in the urban areas of the country. This is 31.16 % of the Country's total population. Now illustrates that the growth of urban population is at a much faster rate than the growth of rural population. India has 475 Urban Agglomerations (UA), three of which has population over 10 million.

Table 1 gives the top five UAs in terms of population. The very high rate of urbanization coupled with improper planning and poor financial condition has made MSW management in Indian cities a herculean task.

Table 1 URBAN AGGLOMERATIONS (UA)

S.N.	CITIES POPULATION	URBAN AGGLOMERATIONS (UA)
1	Greater Mumbai	18.4 Millions
2	Delhi	16.3 Millions
3	Kolkata	14.1 Millions
4	Chennai	8.7 Millions
5	Bangalore	8.5 Millions

Source: censusindia.gov.in/2011-Documents/UAs-Cities-Rv.ppt

Generally in India, MSW is disposed of in low-lying areas without taking proper precautions or operational controls. Therefore, municipal solid waste management (MSWM) is one of the major environmental problems of Indian megacities.

SWM involves activities associated with generation, storage and collection, transfer and transport, treatment and disposal of solid wastes. But, in most Indian cities, the MSWM system comprises only four activities, i.e., waste generation, collection, transportation, and disposal. Poor collection and inadequate transportation causes the accumulation of MSW at every nook and corner.

The MSW amount is expected to increase significantly in the near future as India strives to attain an industrialized nation status by the year 2020.

The solid waste problem is much more severe in urban environments. Municipal solid waste (MSW) is being produced since from human civilization. India is experiencing tremendous growth in urban areas. This increased urbanization associated with growing economy has posed a significance stress on the environment. With the increasing industrialization, man is introducing new and complex chemicals without any rigorous bioassesment of their toxicity. Furthermore continued dispersion of such materials in environment may interfere

with the biological processes fundamental to life. Hence, man is now facing the acute problem of environmental pollution.

One result of a rapid urbanization, a slowly reducing gap between urban and rural, changing consumption patterns, and a growing population is the problem of waste. Although the average Indian only generates around half a kilo of solid waste per day, the volume is huge. Given the current developments, the generation of municipal solid waste in India in the year 2047 has been projected to exceed 260 million tons – a number more than five times the present levels. many households do not recycle their waste, but, instead, tend to dispose it outside their homes or on the streets.

Waste disposal:-Waste disposal implies collecting, transporting, processing (waste treatment), and recycling of waste products, usually produced by human activity, in order to reduce their impact on human health, environmental, aesthetic, or local approval. Recently, the focus of the industry has been on reducing the environmental impact of waste on nature and its more efficient utilization.

Waste disposal concerns all types of waste, whether solid, liquid, or gas, each in its specific sector.

Types of waste disposal:-

- Burning
- Composting
- Incineration
- Control tipping

NEED FOR THE STUDY

"It is good to realize that if love and peace can prevail on earth, and if we can teach our children to honor nature's gifts, the joys and beauties of the outdoors will be here forever.

– Jimmy Carter

The first aim of the survey was to determine how well Municipal Solid Waste is being handled in different areas. By their own admission, the Municipal Corporations are ill-equipped to handle and effectively manage the large quantum of waste generated per day in the areas.

The 22 cities whose responses have been accounted for in this report represent small as well as large cities. The results therefore are fairly representative of the actual status of waste disposal in cities as small as Shimla and as large as Delhi and Greater Mumbai.

The rate of increase of MSW generated per capita is estimated at 1 to 1.33% annually. MSW generation rates in small towns are lower than those of metro cities, and the per capita generation rate of MSW in India ranges from 0.2 to 0.5 kg/ day. It was also estimated that the total MSW generated by 217 million people living in urban areas

was 23.86 Million t/yr in 1991, and more than 39 million ton in 2001.

The Central Pollution Control Board (CPCB) had conducted a survey of solid waste management in 299 cities and has given the data of waste generation for different cities.

Generally in India, MSW is disposed of in low-lying areas without taking proper precautions or operational controls. Therefore, municipal solid waste management (MSWM) is one of the major environmental problems of Indian megacities.

The impact of rapidly growing urban population is reflected in two ways:

- **Growth in waste generation.**
- **Growth in slums with no waste management system.**

STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of Planned teaching programme on solid waste disposal in terms of knowledge and attitude among women in selected rural areas of Gandhinagar district of Gujarat state"

OBJECTIVES

- To assess the knowledge of the women before & after administration of Plan teaching programme regarding solid waste disposal in selected rural areas of Gandhinagar District, Gujarat.
- To assess the attitude of the women before & after administration of Plan teaching programme regarding solid waste disposal in selected rural areas of Gandhinagar District, Gujarat.
- To find out the association between pretest knowledge score and attitude score with selected socio-demographical variables.
- **HYPOTHESES**
- **H_1 :**The mean post-test knowledge score is higher than their mean pre-test knowledge score as measured by the structured knowledge questionnaire at 0.05 level of significance.
- **H_2 :**The mean post-test attitude score is higher than their mean pre-test attitude score as measured by the structured attitude questionnaire at 0.05 level of significance.
-
- **RESEARCH APPROACH:** The research study approach is pre experimental research approach.
- **RESEARCHDESIGN:** The research design selected for the study is pre experimental study one group pre-test/ post-test design.
- **RESEARCH SETTING:** This study was conducted in the selected rural

areas of Gandhinagar District of Gujarat State.

- **TARGET POPULATION:** All the women those lives in selected rural areas of Gandhinagar District.
- **SAMPLE SIZE AND SAMPLING TECHNIQUE**
-
- In the present study sample size consist of 60 women lives in selected rural areas of Gandhinagar District. Investigator adopted probable sampling method in that Investigator will use Simple random sampling technique, in that specifically Investigator divided district in four zone then select one village from each zone (Unava, Palaj, Amiyapur and Karoli) by lottery method.

SELECTION OF TOOLS FOR DATA COLLECTION

1. Structured knowledge questionnaire :

The investigator reviewing the literature pertaining to assess knowledge of women, investigator had prepared knowledge questioners by using multiple choice question method for collection of data regarding Solid waste disposal.

2. Summative Likert's Attitude Scale for measurement of Attitude.

The investigator reviewing the literature pertaining to measure Attitude found that structured summative likert scale was appropriate for collection of data regarding attitude of Women regarding Solid waste disposal.

DEVELOPMENTOFTHE TOOLS:

Development of Planned Teaching Program on Solid waste disposal: PTP was developed by the investigator using the steps given below to provide knowledge and favorable attitude towards Solid waste disposal.

Development of Structured Knowledge questionnaire:

Knowledge questioner tool is used to assess Knowledge on Solid waste disposal by using multiple choice question method.

Development of Summative Likert's attitude scale:

Five point Summative likert's Attitude Scales is used to assess attitude on Solid waste disposal among women.

DESCRIPTION OF THE TOOLS:

The final tool consisted of following three sections:

Section –I: Deals with Demographic data of the Samples. It consist the age, religion, marital status, education qualification, type of the family, monthly family income in rupees, source of information and occupational status.

Section –II: Structured Knowledge Questionnaire consists of total 28 items and each item carries one mark. Maximum score of the questionnaire is 28. There are

total items in the content area related to solid waste disposal are 28 and out of them 13(46.42) items were to assess knowledge level and 05(17.86) items were to assess comprehension level and 10 (35.72) items were to assess the application level.

Section III: In this section investigator had prepared Likert's Attitude Rating Scale for measuring the Attitude. There were total 20 items which express attitude of sample..

RELIABILITY

The reliability of structured knowledge questionnaire was determined by test re-test method using Spearman's rank correlation Formula**.**

Spearman's rank correlation Formula:

$$r_s = 1 - \frac{6(\sum d^2)}{n(n^2-1)}$$

d= RX- RY (RX &RY = Rank)

X = pre-test score

Y= post test score

n= no of sample

The reliability of structured knowledge questionnaire was 0.8 which is more than 0.5; hence the questionnaire was determined by Spearman's rank correlation formula found to be reliable. The reliability was of the Summated Likert's Attitude Scale was 0.9 which is more than 0.5. Hence the Summated Likert's Attitude Scale was found to be reliable.

PROCEDURE FOR DATA COLLECTION

The investigator went go for data collection during December-2015. The samples were selected by probability sampling technique. The investigator has introduced them to the participants and objectives of the study were explained and informed consent was taken. The pretest questionnaires on solid waste disposal were administered followed by Planned Teaching program, and after that post test questionnaires were administered.

PLAN OF DATA ANALYSIS:

The Investigator has planned to analyze the data in the following manner.

Section I: Personal Data were analyzed using frequency and percentage and was presented in the form of table.

Section II: The data from the Structured Knowledge Questionnaire before and after administration of Planned Teaching Programme was analyzed using mean, standard deviation (SD) and't' test and will be presented in the form of tables and graphs.

Section III: The data from the Likert's Attitude rating scale before and after administration of Planned Teaching Programme was analyzed using mean, standard deviation (SD) and 't-test' and were presented in the form of tables and graphs.

ANALYSES AND INTERPRETATION OF DEMOGRAPHIC VARIABLES OF THE SAMPLES.

Table 2 Frequency and percentage wise distribution of samples based on Demographic Variables of the samples

[N = 60]

S. N.	Demographic variables	Frequency(f)	Percentage (%)
1.	**Age: (in years)**		
	a) Less than 20	16	26.67
	b) 21-30years.	27	45.0
	c) 31-40years.	11	18.33
	d) More than 40	06	10.00
2.	**Religion:**		
	a) Hindu	58	96.67
	b) Muslim	02	3.33
	c) Christian	-	0
	d) Any other	-	0
3.	**Marrital status.**		
	a) Married	33	55.00
	b) Unmarried	27	45.00
4.	**Educational qualification.**		
	a) Literate	48	80.00
	b) Illiterate	12	20.00
5.	**Type of the family**.		
	a) Nuclear family	19	31.67
	b) Joint family	41	68.33
6.	**Monthly family income in rupees.**		
	a) Less than 5000	25	41.67
	b) 5001 to 10000	22	36.67
	c) 10001 to 15000	8	13.33
	d) More than 15001	5	8.33
7.	**Sources of information regarding solid waste disposal.**		
	a) Friends	11	18.33
	b) Relatives	6	10.00
	c) Health personnel	24	40.00
	d) Mass medias	19	31.67
8.	**Occupational status.**		
	a) Working women	18	30.00
	b) House wife	42	70.00

ANALYSIS AND INTERPRETATION OF THE DATA RELATED TO THE KNOWLEDGE OF THE SAMPLES BEFORE AND AFTER ADMINISTRATION OF THE PLANNED TEACHING PROGRAMME.

Table 3 Area Wise Mean, Mean Percentage, Standard Deviation (SD), Percentage Gain and Mean Difference of Pre Test and Post Test Knowledge Scores of Samples on solid waste disposal.

[N=60]

Areas of Content	Max. Score	Pre-Test Knowledge Score			Post-Test Knowledge Score			Percentage (%) Gain	Mean difference
		Mean Score	Mean %	SD	Mean Score	Mean %	SD		

Introduction	13	8.5	65.38	2.39	11.76	90.46	1.95	25.08	3.26
Health effects	5	2.15	43	1.11	4.01	80.2	1.60	37.2	1.86
Storage and disposal of waste.	10	4.93	49.3	1.92	8.5	85	3.92	35.7	3.57
TOTAL	28	15.58	55.64	3.91	24.28	86.71	5.33	31.07	8.7

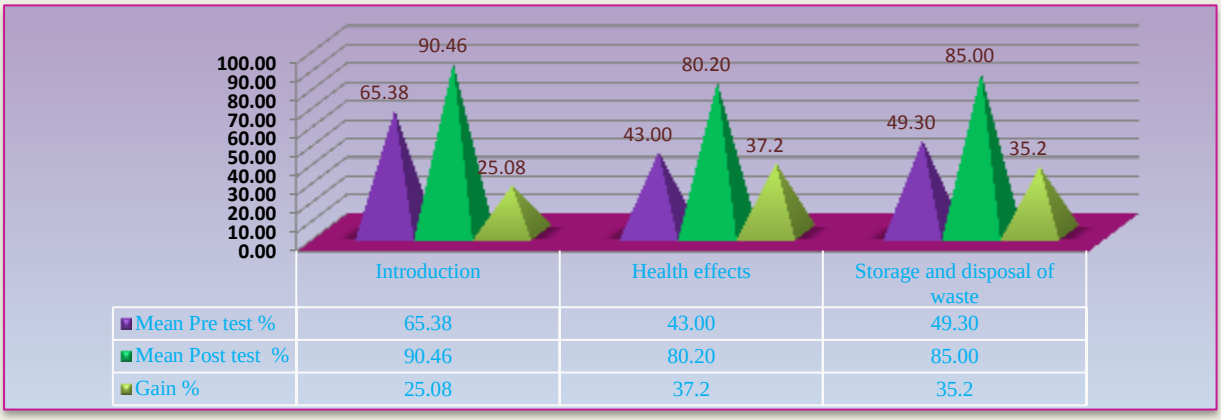

Figure 1 Bar graph showing the area wise mean scores of Pre test knowledge score, Post test knowledge score and gain percentage of samples

Table 4 Level of Knowledge before and after planned teaching programme

Level of knowledge	**Pre test**		**Post test**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Adequate(>75% of scores)	03	5 %	52	86.67 %
Moderate(51-75% of scores)	37	61.67 %	08	13.33 %
Inadequate(<50% of scores)	20	33.33 %	00	00 %
Total	**60**	**100 %**	**60**	**100 %**

Table 5 Mean, Mean Difference, Standard Deviation (SD) and't' test value of the Pre-test and Post-test Knowledge scores or Samples **[N=60]**

Knowledge test	**Mean**	**Mean difference**	**SD**	**Calculated 't' value**	**Table 't' value**	**df**
Pre-test	15.58	8.7	3.94	16.92*	2.00	59
Post-test	24.28					

Level of significance P=0.05
Degree of freedom (df =59).

Table 6 Level of attitude before and After Planned teaching programme. [N=60]

Level of Attitude	**Pre-test**		**Post-test**	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Favorable(61 to 100)	44	73.33	52	86.67
Unfavorable(20 to 60)	16	26.67	08	13.33
Total	60	100%	60	100%

Table 7 Mean, Mean Difference, Standard Deviation (SD) and't' test value of the Pre-test and Post-test attitude scores of samples **[N=60]**

Attitude scale	**Mean**	**Mean difference**	**SD**	**Calculated 't' value**	**Table 't' value**	**Df**
Pre-test	68.71	7.95	9.41	6.48*	2.00	59
Post-test	76.66					

*Significance at the level of 0.05

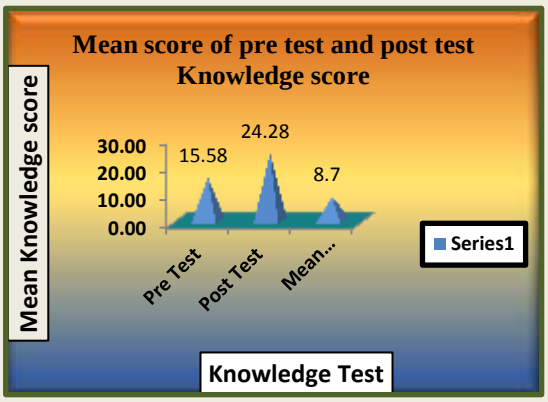

Figure 2 Bar Graph Showing the Comparison of Mean Pre Test and Mean Post Test Knowledge Scores.

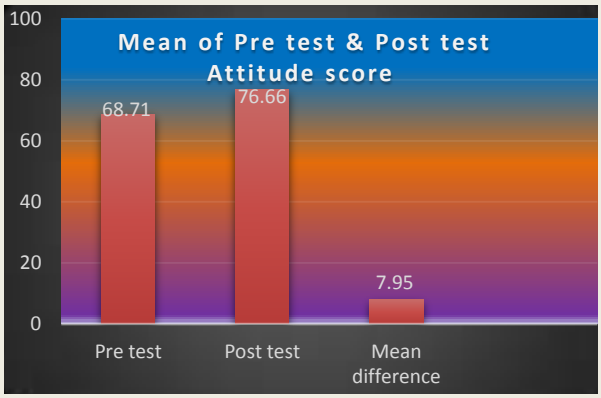

Figure 3. Bar graph showing mean of Pre test and Post test Attitude score

Table 8. Analysis and interpretation of association of the pre test knowledge scores with selected demographic variables

VARIABLES		FREQUENCY	Chi quare (X^2) Calculated Value	Chi quare (X^2) Table Value	DF	ASSOCIATION
Age: (in years)						
1. 20	Less than	16 27	6.71	12.59	6	Not Significant
2. 30years.	21-	11 06				
3. 40years.	31-					
4.	More than 40					
Religion:						
a)	Hindu	58				Not
b)	Muslim	02	0.81	12.59	6	significant
c)	Christian	-				
d)	Any other	-				
Marital status.						
a)	Married	33	0.39	5.99	2	Not significant
b) d	Unmarrie	27				
Educational qualification.						
a)	Literate					
b)	Illiterate	48 12	0.226	5.99	2	Not significant
Type of the family.						
a) Nuclear family		19	5.626	5.99	2	Not

b) Joint family		41				significant
Monthly family income in rupees.						
a)	Less than	25	20.359	12.59	6	
5000		22				significant
b)	5001 to	08				
10000		05				
c)	10001 to					
15000						
d)	More					
than 15001						
Sources of information regarding solid waste disposal.						
a)	Friends	11				
b)	Relatives	6	13.434	12.59	6	Significant
c)	Health	24				
personnel		19				
d)	Mass					
medias						
Occupational status.						
a)	Working	18	3.4833	5.99	2	Not significant
women		42				
b)	House					
wife						

Table 9 Analysis and interpretation of association of the pre test attitude scores with selected demographic variables.

VARIABLES		FREQUENCY	Chi quare(X^2)		DF	ASSOCIATION
			Calculated Value	Table Value		
Age: (in years)						
1.	Less than	16				Not
20		27	0.772	7.82	3	Significant
2.	21-	11				
30years.		06				
3.	31-					
40years.						
4.	More than 40					
Religion:						
a)	Hindu	58				Not
b)	Muslim	02	0.576	7.82	3	significant
c)	Christian	-				
d)	Any other	-				

Marrital status.						
a)	Married	33	3.526	3.84	1	Not significant
b)	Unmarrie	27				
d						
Educational qualification.						
a)	Literate		7.691	3.84	1	
b)	Illiterate	48				Significant
		12				
Type of the family.				3.84		
a) Nuclear family		19	0.001		1	Not
b) Joint family		41	7			Significant
Monthly family income in rupees.						
a)	Less than	25	3.106	7.82	3	Not
5000		22				significant
b)	5001 to	09				
10000		04				
c)	10001 to					
15000						
d)	More					
than 15001						
Sources of information regarding solid waste disposal.						
a)	Friends	11				
b)	Relatives	6	2.845	7.82	3	Not
c)	Health	24				Significant
personnel		19				
d)	Mass					
medias						
Occupational status.						
c)	Working	18	0.016	3.84	1	Not significant
women		42	2			
d)	House					
wife						

MAJOR FINDINGS OF THE STUDY:

Knowledge of samples regarding solid waste disposal among women.

The mean pre-test knowledge score of samples about solid waste disposal was 15.58 where as post-test knowledge score was 24.28.The mean post test knowledge score is significantly higher than the mean pretest knowledge score with the mean difference of 8.7 and the calculated‘t’ value (t =16.92) was greater than tabulated ‘t’ value (t =2.00) which was statistically proved at 0.05 level of significance. Therefore the null hypothesis H_{01} was rejected and research hypothesis H_1 was accepted and it revealed that the Planned

Teaching Programme was effective in increasing knowledge among women.

Association with pre test knowledge score of women and selected demographic variables.

The findings of the study reveals that there is significant association with pre-test knowledge scores and selected demographic variables such as monthly family income (χ^2= calculated value 20.35> table value 12.59; it was mostly because of data were highly skewed) and Source of information (χ^2=calculated value 13.43> table value 12.59), at 0.05 level of significance.

Attitude of samples regarding solid waste disposal among women.

The mean pre-test attitude score of samples about solid waste disposal was 68.71. Where as post-test attitude score was 76.66.The mean post test attitude score is significantly higher than the mean pre-test attitude score with the mean difference of 7.95 and the calculated value (t = 6.48) was greater than tabulated't' value (t =2.00) which was statistically proved at 0.05 level of significance. Therefore the null hypothesis H_{02} was rejected and research hypothesis H_2 was accepted and it revealed that the Planned Teaching Programme was effective in increasing attitude among women.

Association with pre test attitude score of women and selected demographic variables.

The findings of the study reveals that there is significant association with pre-test attitude scores and selected demographic variables such as educational qualification (χ^2= calculated value 7.69> table value 3.84; it was mostly because of data were highly skewed), at 0.05 level of significance.

CONCLUSIONS

The following conclusions can be drawn from the study findings.

1. Knowledge deficit existed in all the area of Selected Solid waste disposal before implementation of Planned Teaching Programme among women of selected rural areas of Gandhinagar district.
2. Inadequate knowledge existed in area of health effect. The mean pre test knowledge score of samples was 2.15(43%) in health Effect which increased up to 4.01(80.02%) in post test score after administration of Planned Teaching Programme.
3. Samples gained significant knowledge after they exposed to Planned Teaching Programme. The mean post test knowledge Score 24.28 was significantly higher than mean pre test knowledge score 15.58. Thus the Planned Teaching Programme was

found to be effective in enhancing the knowledge of women regarding solid waste disposal.

4. There is significant association of pre test knowledge score with selected demographic data such as Monthly family income, source of information.

5. Samples unfavorable Attitude changed after they exposed to Planned teaching Programme. The mean post test attitude score 76.66 was significantly higher than mean pre test attitude score 68.71. Thus the Planned teaching Programme was found to be effective in changing the unfavorable attitude to favorable attitude of women regarding solid waste disposal.

6. There is significant association of pre test attitude score with selected demographic variable such as educational qualification.

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