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COMPARATIVE STUDY ON EFFECTIVENESS OF NUTRITION COUNSELING FOR ECO-FRIENDLY PACKAGING OF STREET FOODS IN RURAL AND URBAN AREAS IN LUCKNOW CITY, INDIA

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Abstract
Street foods often reflect traditional local cultures and exist in an endless variety. The present study was carried out with the objective to study the effectiveness of nutrition counseling for eco-friendly packaging of street foods in rural and urban areas in Lucknow city. Majority 91% of the subjects in rural area were consuming street food in rural areas before the intervention which decreased to 79% after the intervention. Similar observation was found in urban areas. There was significant ($p<0.05$) positive change in few of the major parameters indicating positive change in the attitudes from before to after intervention in both rural and urban areas. There was significant ($p<0.05$) positive change in almost all the parameters of awareness regarding biodegradable packaging from before to after intervention in rural and urban areas.
Keywords- Biodegradable Packaging, Street Food, Effectiveness, Intervention, Reproductive Age

I. INTRODUCTION

Street foods and fast foods are low in cost compared with restaurant meals and offer an attractive alternative to home-cooked food. In spite of these similarities, street food and fast food enterprises differ in variety, environment, marketing techniques and ownership Lucknow is known as city of Nawabs, here one may find great historical place and along with great rich divine taste of food. Lucknow city is fully packed with lot of famous restaurants located in top class hotels and posh areas. Lucknow also has some famous street food corners which are famous for their cooking and preparation techniques which makes them unique from others A package provides protection, tampering resistance, and special physical, chemical, or biological needs. It may bear a nutrition facts label and other information about food being offered for sale**.** Package design and construction play a significant role in determining the shelf life of a food product. The right selection of packaging materials and technologies maintains product quality and freshness during distribution and storage. Materials that have traditionally been used in food packaging include glass, metals (aluminum, foils and laminates, tinplate, and tin-free steel), paper and paperboards, and plastics. Moreover, a wider variety of plastics have been introduced in both rigid and flexible forms. Today's food packages often combine several materials to exploit each material's functional or aesthetic properties. As research to improve food packaging continues, advances in the field may affect the environmental impact of packaging. The principal roles of food packaging are to protect food products from outside influences and damage, to contain the food, and to provide consumers with ingredient and nutritional information. Traceability, convenience, and tamper indication are secondary functions of increasing importance. The goal of food packaging is to contain food in a cost-effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impact. Materials that have traditionally been used in food packaging include glass, metals (aluminum, foils and laminates, tinplate, and tin-free steel), paper and paperboards, and plastics. Moreover, a wider variety of plastics have been introduced in both rigid and flexible forms. Today's food packages often combine several materials to exploit each material's

functional or aesthetic properties. As research to improve food packaging continues, advances in the field may affect the environmental impact of packaging

II. MATERIALS AND METHODS

As per the requirement of the research, adults were surveyed in the city to gather data about attitude and awareness of packaging before and after the nutrition counseling. This study was conducted among different areas. Urban areas included : Nirala Nagar, Aliganj, Babuganj, Indira Nagar and for Rural Areas : Slums of Nishatganj, Saraihassanganj, Nirala Nagar, Daliganj, Hanuman Setu road, Lucknow, India. The survey was carried out for a period of approximately 120 days. Purposive sampling techniques was used for the selection of the respondents. Total 200 people were surveyed in this research study including 100 each from urban and rural areas**.** The data was collected through a developed Questionnaire, which was enclosed with following Information- General Information, Attitude regarding packaging of street foods and Awareness regarding biodegradable packaging. In addition to these tools, one to one Counseling and Interactive sessions in group took place. The statistical tests which were included in this study were- Chi-square test and McNemar's Test. Educational Intervention / Behavioural Intervention was included in this research study. Teaching Aids which were included in this study were- Flash Cards, Pamphlets, Charts.

III. RESULTS

The study revealed the comparison of attitudes towards packaging of street foods from before to after intervention in rural and urban areas. Majority (91%) of the subjects in rural area were consuming street food in rural areas before the intervention which decreased to 79% after the intervention. Similar observation was found in urban areas. There was significant ($p<0.05$) positive change in almost all the attitudes from before to after intervention in both rural and urban areas. **(Table 1)**

Table-1: Comparison of attitudes towards packaging of street foods from before to after intervention in rural and urban areas

Attitudes towards packaging of street foods	Rural (n=100)					Urban (n=100)				p-value[1]
	Before		After		p-value[1]	Before		After		
	No.	%	No.	%		No.	%	No.	%	
Often consume street food										
Yes	91	91.0	79	79.0	0.01*	96	96.0	89.0	89.0	0.02*
No	9	9.0	21	21.0		4	4.0	11.0	11.0	
Packaging of street foods bothers										
Yes	17	17.0	78	78.0	0.001*	32	32.0	63	63.0	0.001*
No	83	83.0	22	22.0		68	68.0	37	37.0	
Is non-packaged street food is safe to eat										
Yes	68	68.0	8	8.0	0.001*	46	46.0	14	14.0	0.001*
No	32	32.0	92	92.0		54	54.0	86	86.0	
Packaging of food affects nutritional status of any food										
Yes	16	16.0	91	91.0	0.001*	30	30.0	86	86.0	0.001*
No	84	84.0	9	9.0		70	70.0	14	14.0	
Ill-packaging can cause diseases										
Yes	34	34.0	86	86.0	0.001*	62	62.0	78	78.0	0.001*
No	66	66.0	14	14.0		38	38.0	22	22.0	
Prefer newspaper packaged food										
Yes	71	71.0	29	29.0	0.001*	48	48.0	52	52.0	0.04*
No	29	29.0	71	71.0		52	52.0	48	48.0	
Prefer eating hot food packed in polythene bags										
Yes	30	30.0	68	68.0	0.001*	53	53.0	42	42.0	0.001*

No	70	70.0	32	32.0		47	47.0	58	58.0	
Practice of polythene and newspaper packaging in kitchen										
Yes	67	67.0	29	29.0	0.001*	40	40.0	52	52.0	0.001*
No	33	33.0	71	71.0		60	60.0	48	48.0	
Aware of food safety and standard authority of India										
Yes	0	0.0	15	15.0	-	0	0.0	24	24.0	-
No	100	100.0	85	85.0		100	100.0	76	76.0	
Consider family's health priority										
Yes	83	83.0	92	92.0	0.03*	72	72.0	90	90.0	0.02*
No	17	17.0	8	8.0		28	28.0	10	10.0	

[1]McNemar's test, *Significant

The Graphical Representation of the data has been depicted in the figures showing significant positive change in almost all the attitudes from before to after. **(Figure A and B)**

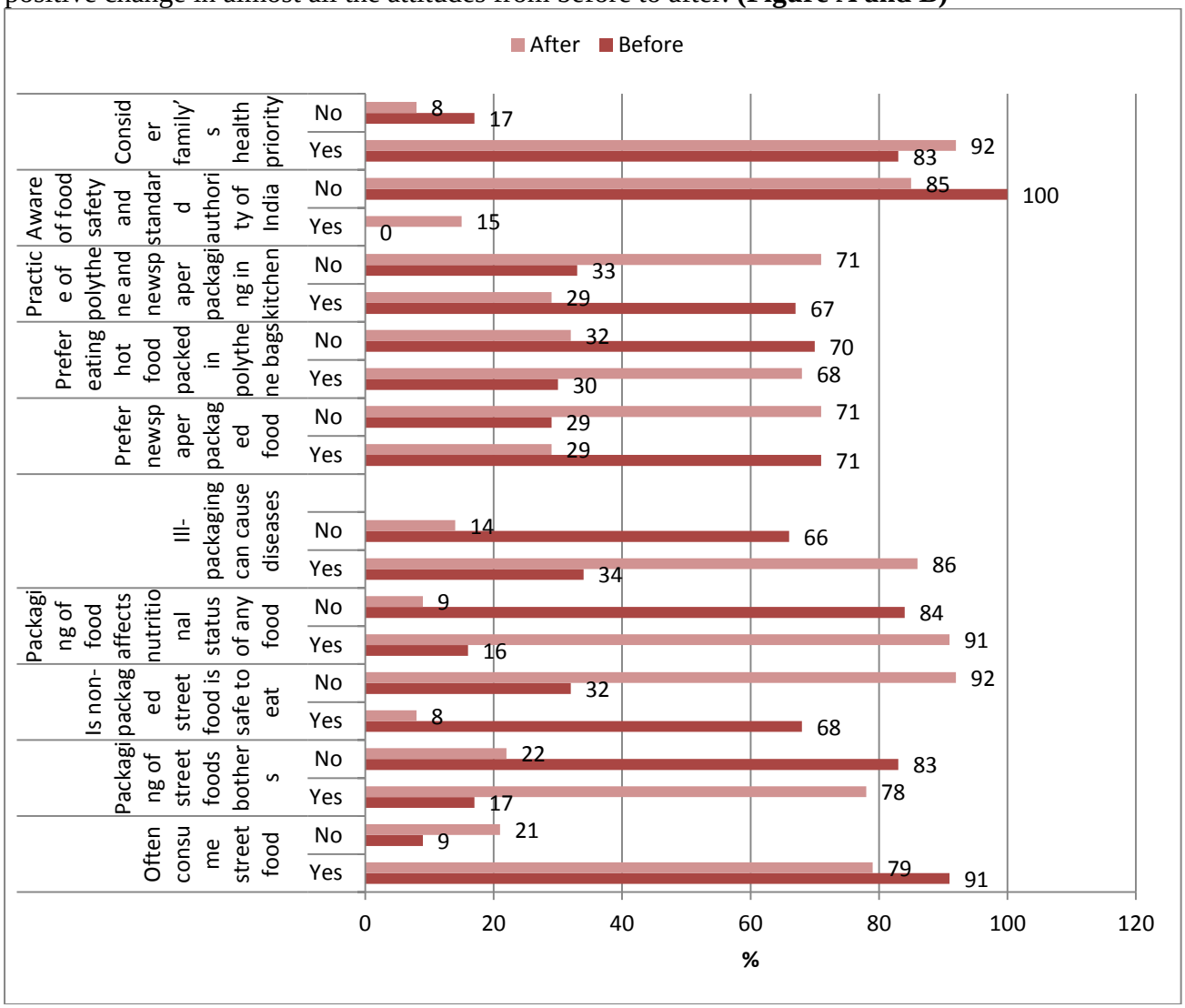

Figure A : Comparison of attitudes towards packaging of street foods from before to after intervention in rural areas

The comparison of awareness regarding biodegradable packaging from before to after intervention in rural and urban areas. There was significant ($p<0.05$) positive change in few of the major parameters of awareness regarding biodegradable packaging from before to after intervention in rural and urban areas. **(Table 2)** The Graphical Representation of Urban and Rural Areas showing Significant positive change in the awareness among people before and after. **(Figure C and D)**

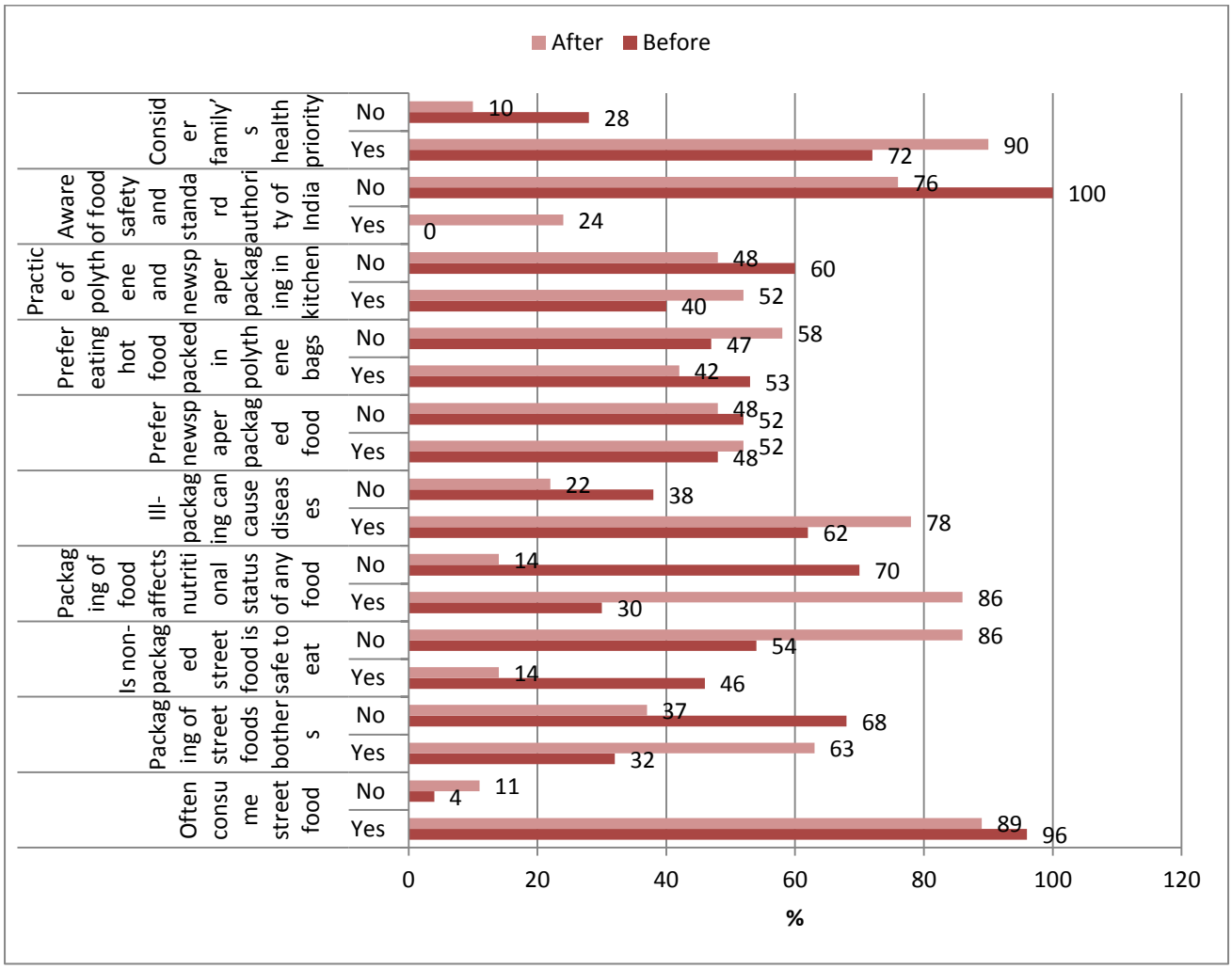

Figure B : Comparison of attitudes towards packaging of street foods from before to after intervention in urban areas.

Table-2 : Comparison of awareness regarding biodegradable packaging from before to after intervention in rural and urban areas

Awareness regarding biodegradable packaging	Rural (n=100)					Urban (n=100)				p-value[1]
	Before		After		p-value[1]	Before		After		
	No.	%	No.	%		No.	%	No.	%	
Consider himself healthy										
Yes	43	43.0	49	49.0	0.02*	80	80.0	93	93.0	0.01*
No	57	57.0	51	51.0		20	20.0	7	7.0	
Understand the importance of packaging of food										
Yes	37	37.0	74	74.0	0.001*	68	68.0	76	76.0	0.001*
No	63	63.0	26	26.0		32	32.0	24	24.0	
Understand the meaning of eco-friendly packaging										
Yes	28	28.0	81	81.0	0.001*	52	52.0	66	66.0	0.001*
No	72	72.0	19	19.0		48	48.0	34	34.0	
Even heard about Edible Cutlery										
Yes	2	2.0	44	44.0	0.001*	5	5.0	65	65.0	0.001*
No	98	98.0	56	56.0		95	95.0	35	35.0	
Knowledge about biodegradable packaging materials										
Yes	18	18.0	72	72.0	0.001*	30	30.0	50	50.0	0.001*
No	82	82.0	28	28.0		70	70.0	50	50.0	

Ever motivated friends and neighbors for not consuming non-biodegradable packaged food										
Yes	23	23.0	65	65.0	0.001*	40	40.0	100	100.0	-
No	77	77.0	35	35.0		60	60.0	0	0.0	
Aware of the health benefits of consuming proper packaged food										
Yes	38	38.0	83	83.0	0.001*	70	70.0	93	93.0	0.001*
No	62	62.0	17	17.0		30	30.0	7	7.0	
Prefer eating plastic coated re-heated food										
Yes	45	45.0	12	12.0	0.001*	84	84.0	18	18.0	0.001*
No	55	55.0	88	88.0		16	16.0	82	82.0	
Promote the street vendors to use biodegradable packaging materials										
Yes	18	18.0	78	78.0	0.001*	30	30.0	62	62.0	0.001*
No	82	82.0	22	22.0		70	70.0	38	38.0	
Have any alternative to promote eco-friendly packaging among street vendors										
Yes	7	7.0	52	52.0	0.001*	8	8.0	77	77.0	0.001*
No	93	93.0	48	48.0		92	92.0	23	23.0	

[1]McNemar's test, *Significant

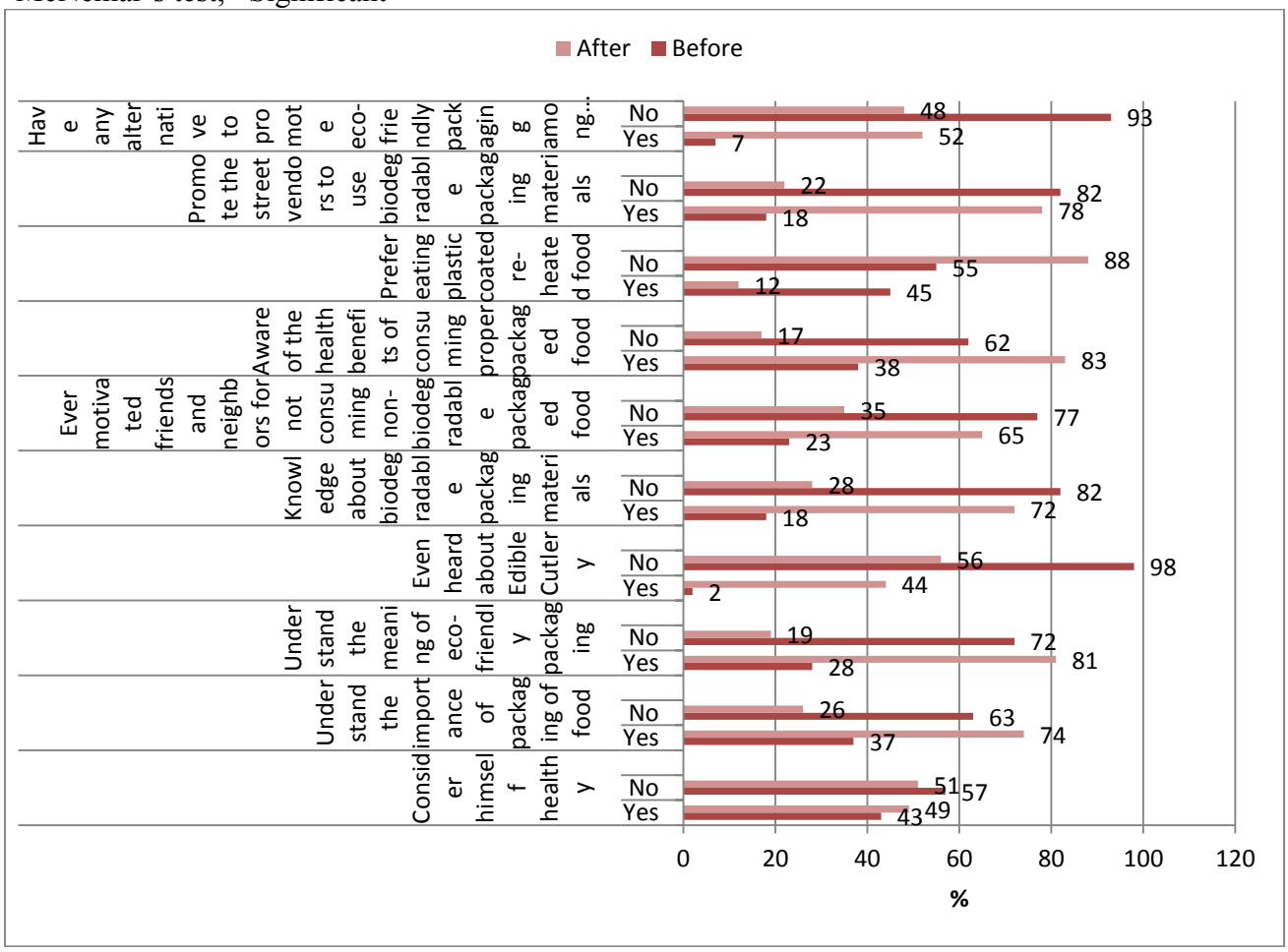

Figure C: Comparison of awareness regarding biodegradable packaging from before to after intervention in rural areas

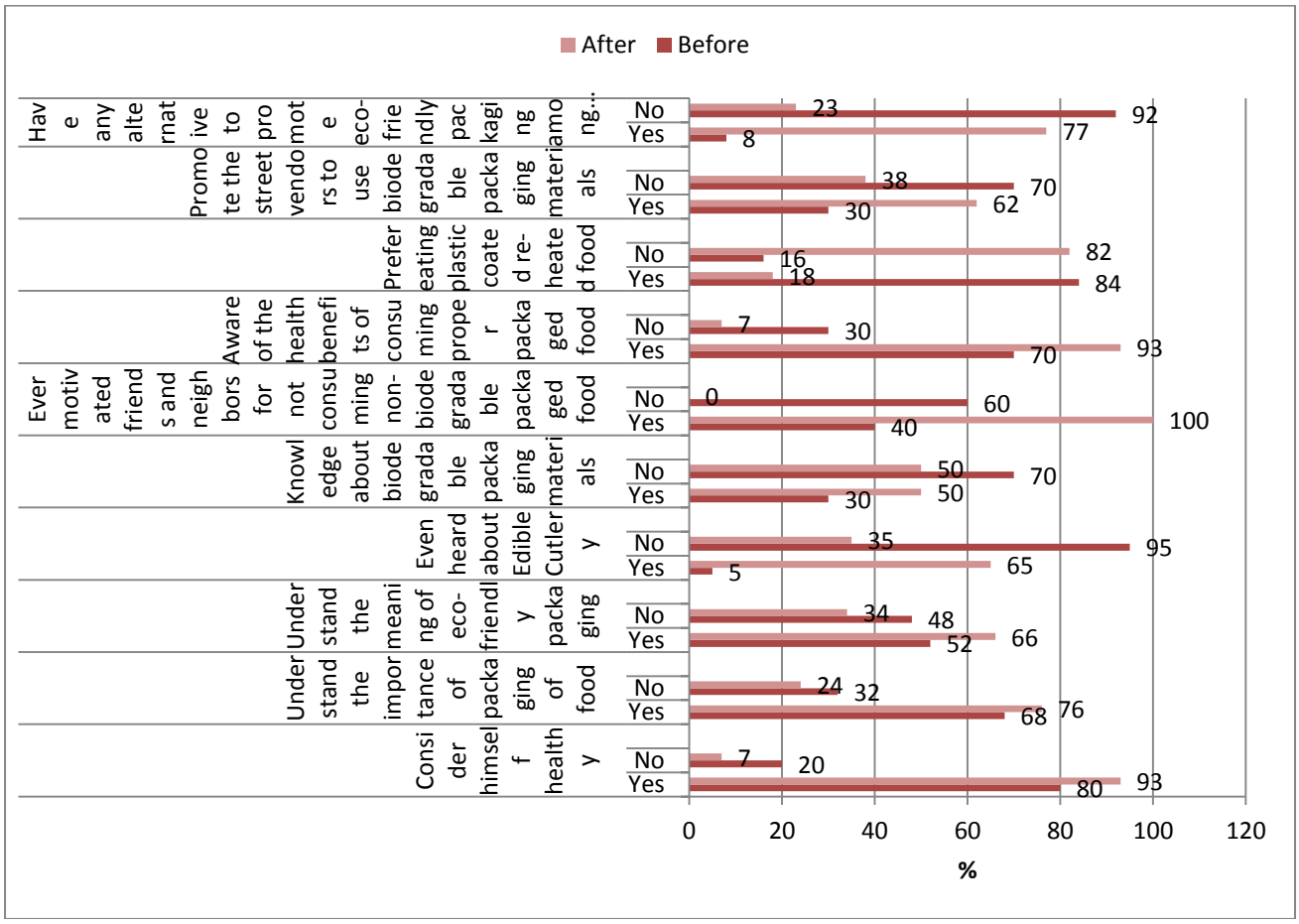

Figure D: Comparison of awareness regarding biodegradable packaging from before to after intervention in rural areas

IV. DISCUSSIONS

India, being a country of skilled and intelligent people, it is quite important for the people of Urban and Rural areas to take care of their health in a long run. The only requirement is the correct knowledge and awareness about certain things. Packaging of street food is no less. After the conduction of survey it has been concluded that the awareness level regarding Packaging and Eco-friendly Packaging was quite poor among both Urban and Rural Areas before counseling. People of Rural and Urban areas looked interested during the counseling Programmes. Also, the use of different teaching aids made them inquisitive, which due to some extent increased the awareness level of the people regarding Eco-friendly packaging of food. Like, the consumption rate of street food becomes less too after the intervention, from 91% to 79% in rural, whereas from 96% to 89% in urban. This study was beneficial and made the people answer, three important questions-

1. Should Packaging of street food still be underrated or undervalued?
2. What are the different Health Hazards of using non-biodegradable food packaging materials?
3. Are there any Alternatives for the normal non-biodegradable packaging materials? What are they?

The people selected for the case study were educated and uneducated both and this comparative data might be helpful for food industries, industries those are working in field of manufacturing of biodegradable packaging and scientists/researcher working on development of biodegradable packaging materials. Packaging now a days has different varieties and number of different techniques and this research work will help the marketing industry to synthesize new techniques and materials keeping environment friendly attitude in mind. Apparently, the study not only revealed the scenario of the current situation of Awareness and Attitude of the people of Urban

and Rural areas but also did intervention by counseling them and recording their Awareness level, thereafter.

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