A study to assess the effectiveness of information booklet on knowledge regarding ill effects of food adulteration among people of selected area

Ms. Neha Singh, Government Institute of Medical Science, Greater Noida[1]

Mr. Prasidh Narayan Pathak, Government Institute of Medical Science, Greater Noida[2]

Ms. Ankush Yadav, Government Institute of Medical Science, Greater Noida[3]

Mr. Aditya Narayan Pathak, Community Health Officer, Gorakhpur[4]

Abstract

Background: Food adulteration is a significant public health hazard that affects the quality of life of people by compromising the wholesomeness of food. This study was conducted to address the knowledge gap regarding the ill effects of food adulteration among individuals in selected areas of Gorakhpur, India.

Aim: The study aimed to assess the effectiveness of an information booklet in increasing knowledge about the ill effects of food adulteration among the target population. The specific objectives were to evaluate pre-test and post-test knowledge levels and determine if there was a significant association between post-test knowledge and selected demographic variables.

Methodology: A quantitative, one-group pre-test and post-test design was used. A total of 100 people were recruited from Gorakhpur city using a non-probability convenience sampling technique. Data was collected using a structured questionnaire that had been validated by five subject experts. A baseline proforma was used to gather demographic details, while the knowledge questionnaire consisted of 30 items categorized into knowledge, comprehension, and application domains. A pre-test was administered to assess baseline knowledge, followed by the distribution of the information booklet. After a specified period, a post-test was conducted to re-evaluate the participants' knowledge.

Results: The pre-test revealed that the majority of participants had inadequate knowledge regarding the ill effects of food adulteration: 86% had inadequate knowledge (score of <50%), 16% had moderate knowledge (score of 51–75%), and only 2% had adequate knowledge (score of >75%). Following the intervention with the information booklet, the post-test results showed a significant improvement in knowledge. 54% of participants achieved a moderate knowledge score, and 37% achieved an adequate knowledge score, with only 9% remaining in the inadequate knowledge category.

Conclusion: The findings indicate that the information booklet was an effective educational tool for increasing knowledge about the ill effects of food adulteration. The significant improvement from the pre-test to the post-test demonstrates the potential of such information, which can help people make better food choices and mitigate the health risks associated with adulterated food.

INTRODUCTION

Food is the basic requirement of all living beings for their growth. It is the right of every citizen to have access to clean, safe, and nutritious food. The health and the productivity of the population depend on the nature of the food they consume and its wholesomeness in terms of their nutritional value.

Adulteration most often includes artificial colours, sand, marble chips, stones, mud, other filthy material, talc, chalk powder, water, mineral oil, vegetable oil, argemone seeds, etc. There are various techniques to detect the adulterants, such as chemical methods or with the help of sensitive instruments, such as a lactometer.

A survey was conducted by Mysore Grahakara Parishat in 2008 in Mysore, Karnataka. The study revealed that Metanil yellow and lead chromate were the common adulterants found in food products. Out of four hundred samples collected from 38 local shops, 43%of toor dhal was found adulterated. 50% of Bengal

gram was of poor quality, 28% samples had Metanil yellow, 6% had auramine dye, and 29% of green gram was adulterated. Other samples, such as turmeric, chilli powder, cumin seeds, ghee, and butter, were also highly adulterated.

Food, as a basic need for all people, must be wholesome and safe. Food adulteration is a major public hazard that affects the quality of life of people. The nature of food adulteration and contamination may vary from place to place, or there could be newer adulterants, as a result of changing environmental factors, like non-seasonal rains or improved production/cultivation practices.

Food is adulterated to increase the quantity and make more profit. The food is stripped of its nutrients, and the place where the food is grown is often contaminated. For example, Milk is mixed with water. A papaya seed is used as an adulterant for pepper. Brick-powder is used as an adulterant for chili powder. Tamarind seed powder is used as an adulterant for coffee. Wood powder is adulterated for turmeric and dhaniya powder.

OBJECTIVES

- To assess pre-test and post-test knowledge regarding the ill effects of food adulteration among people of the selected area.
- To assess the effectiveness of the information booklet on knowledge regarding the ill effects of food adulteration among people in selected areas by post-test knowledge score.
- To find out the association between post-test knowledge and selected demographic variables.

STATEMENT OF PROBLEM

“A study to assess the effectiveness of an information booklet on knowledge regarding the ill effects of food adulteration among people in a selected area”

HYPOTHESES

H1: There will be a significant difference between the pre- and post-test knowledge regarding the ill effects of food adulteration.

H2: There will be a significant association between the pre-test knowledge score with selected demographic variables.

SAMPLE SIZE

A sample refers to the subset of a population selected to participate in a research study. In the present study, the samples were 100 people in Gorakhpur city.

SAMPLING TECHNIQUE

Non-probability sampling involves the deliberate selection of particular units of the population to constitute a sample. Convenience sampling is a type of non-probability sampling in which the population elements are selected for inclusion in the sample based on ease of access. Convenience sampling entails using the most conveniently available people as study participants. Convenience sampling was used to collect data from the samples.

PREPARATION OF BLUEPRINT

An extensive review of literature and discussion with the guide were carried out. The distribution of items in the structured knowledge questionnaire on ill effects of food adulteration was categorized based on three domains were as follows: Knowledge 17 (56.66%), comprehension 5 (16.66%), and application 8 (26.66%) out of 30 items.

DESCRIPTION OF THE FINAL TOOL

TOOL I: BASELINE PROFORMA

A structured knowledge questionnaire was used to collect the demographic data. It consists of identification data such as age in years, gender, educational status, monthly income of the family, and prior knowledge.

TOOL II: STRUCTURED KNOWLEDGE QUESTIONNAIRE TO ASSESS THE KNOWLEDGE OF FEMALE.

The maximum score was 30. The items were developed as to cover 1 areas, namely

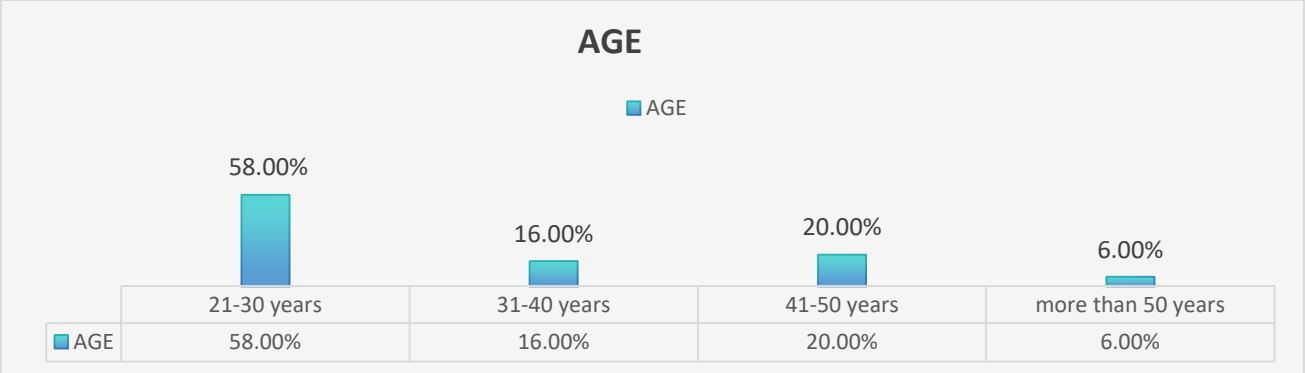

Fig.1.1 Age (in years): The study represents the percentage distribution of study subjects by age group, out of 100 subjects 58% (58) of the subjects belongs to the age group of 21-30 years, 16% (16) in the age group of 31-40 years, 20% (20) subjects belongs to the 41-50 years and 06% (06) subjects belongs to the more than 50 years

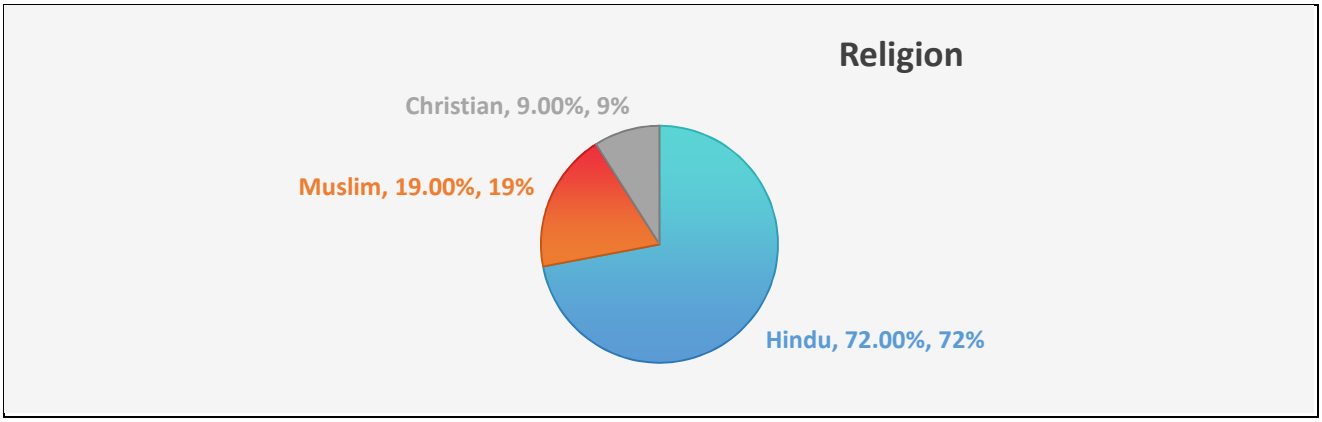

Fig1.2 Religion: The study represents the percentage distribution of study subjects by Religion, out of 100 subjects 72% (72) of the subjects belongs to the Hindu and 19% (19) belongs to Muslim and 9%% (09) belongs to other group of religion.

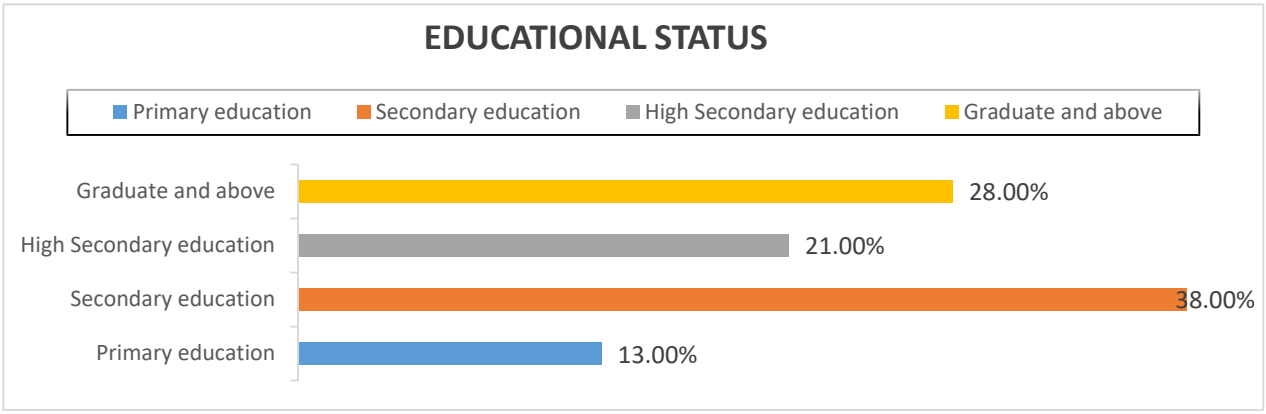

Fig1.3 Educational status of people: The study represents the percentage distribution of study subjects by educational status of people, out of 100 subjects majority of subjects 13% (13) of the subjects belongs to the primary education group and 38% (38) in the group of secondary education, 21% (21) of them are in group of high secondary education and 28% (28) of them are in group of graduate and above.

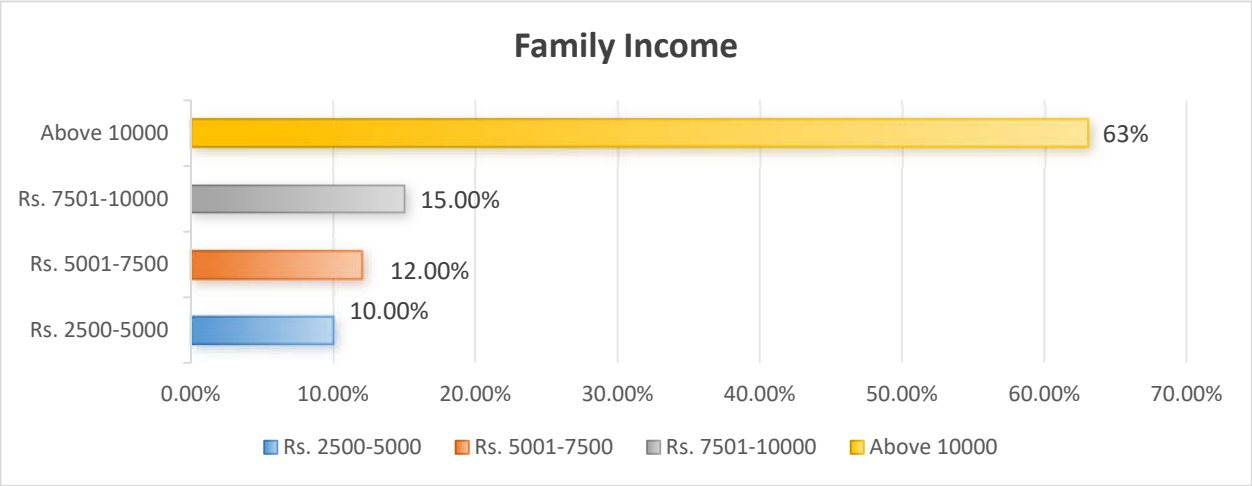

Fig1.4 Family income per month: The study represents the percentage distribution of study subjects by family income per month, out of 100 subjects majority of subjects 10% (10) of the subjects belongs to the income Rs. 2500-5000 per month group, 12% (12) of the subjects belongs to the income Rs. 5001-7500 per month group, 15% (15) of the subjects belongs to the income Rs. 7501-10000 per month group and 63% (63) of the subjects belongs to the income Rs. Above 10000 per month group.

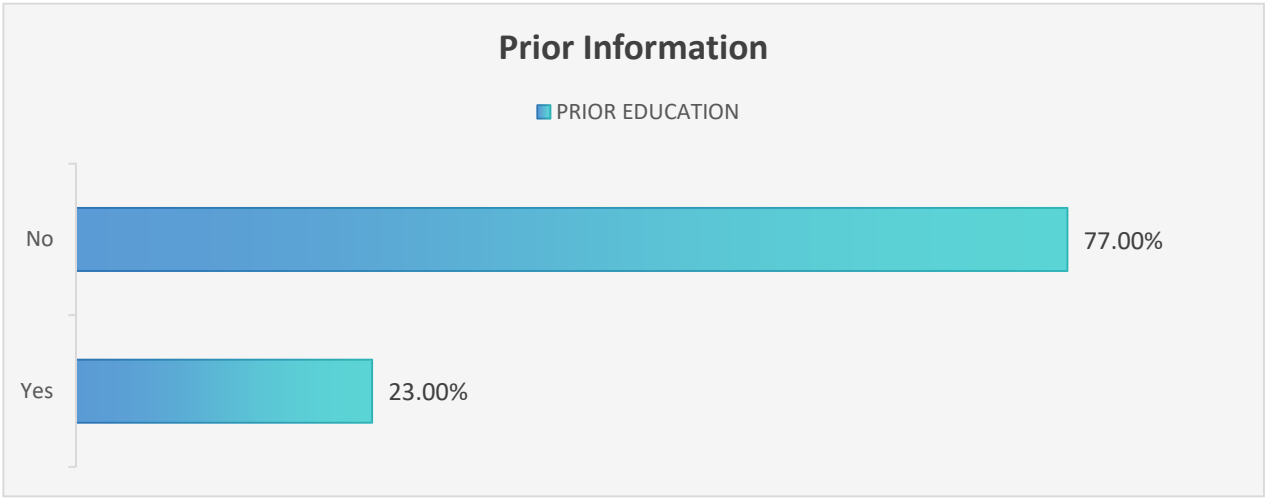

Fig1.5 Prior knowledge regarding food adulteration: Distribution of study subjects with reference to Knowledge about is that most of the subjects 77% (77) have not idea and 23% (23) having idea about Food adulteration.

Table – 1.1

FREQUENCY AND PERCENTAGE DISTRIBUTION OF PRE-TEST LEVEL OF KNOWLEDGE

Level of knowledge	Max Score	In-adequate		Moderate		Adequate	
		F	%	F	%	F	%
Ill effect of food adulteration	**30**	**86**	**86.00**	**16**	**16.00**	**2**	**02.00**

N= 100

Table 1.1: Gives the information about the total maximum scores i.e. 30, percentage and frequency distribution of pre-test level of knowledge in different aspect of Ill effect of food adulteration among People. It is clear from the data that 86% (86) had In-adequate, 16% (16) has moderate knowledge and 2% (02) has adequate knowledge related to knowledge related to Ill effect of food adulteration. Hence, assumption 1 is accepted i.e. People will have certain knowledge about Ill effect of food adulteration.

Table – 1.2 FREQUENCY AND PERCENTAGE DISTRIBUTION OF POST-TEST LEVEL OF KNOWLEDGE

Level of knowledge	Max Score	In-adequate		Moderate		Adequate	
		F	%	F	%	F	%
Ill effect of food adulteration	**30**	**09**	**09.00**	**54**	**54.00**	**37**	**37.00**

N = 100

Table 1.2: Gives the information about the total maximum scores i.e. 30, percentage and frequency distribution of post-test level of knowledge in different aspect of Ill effect of food adulteration among People. It is clear from the data that 09% (09) had In-adequate, 54% (54) has moderate

knowledge and 37% (37) has adequate knowledge related to knowledge related to Ill effect of food adulteration.

Table – 1.3 COMPARISION OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE

Level of knowledge	Pre-test		Post-test	
	F	%	F	%
In-adequate	82	82.00	09	09.00
Moderate	16	16.00	54	54.00
Adequate	02	02.00	37	37.00
Total	100	100.00	100	100.00

N = 100

Table 1.3: Shows that before information booklet (pre-test), out of 100 subjects 82.00% (82) had inadequate knowledge, 16.00% (16) had moderate and 2.00% (02) adequate knowledge regarding Ill effect of food adulteration. After information booklet (post-test), out of 100 subjects 09.00% (09) had inadequate knowledge, 54.00% (54) had moderate and 37.00% (37) had adequate knowledge aspect of Ill effect of food adulteration, which means that information booklet was effective.

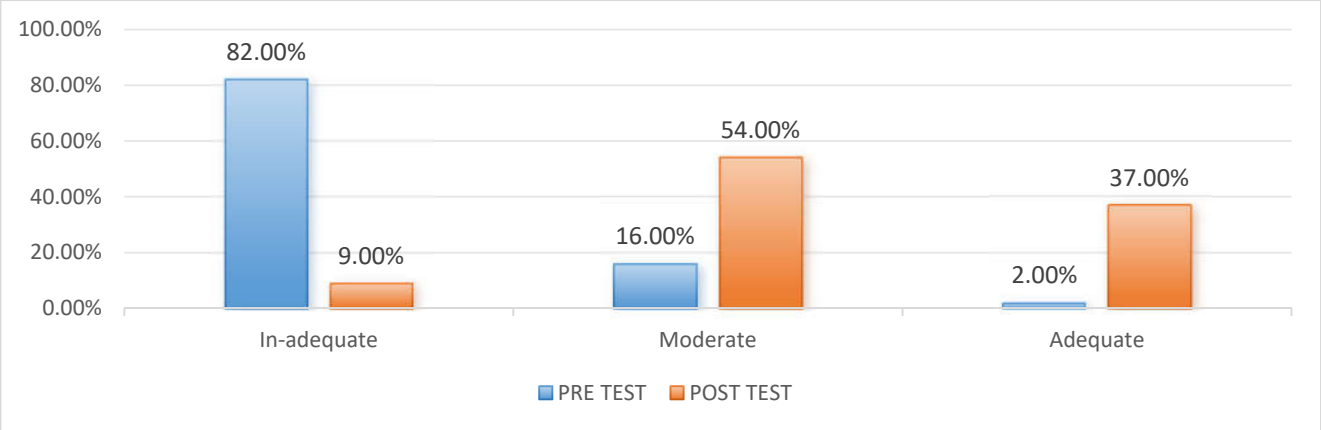

Figure 1.6: Comparison of Pre-test and Post-Test Level of Knowledge

Table: 1.4

MEAN, S.D., RANGE, MEAN SCORE PERCENTAGE OF KNOWLEDGE SCORE BEFORE INTERVENTION

S. No.	Aspect of Knowledge	Max possible score	Mean	SD	Range	Mean %
1.	Ill effect of food adulteration	30	13.53	2.931	17	45.10

N=100

Table 1.4: Shows the mean, SD, range, mean score percentage of knowledge score before information booklet i.e. aspect wise pre-test mean knowledge of people indicates that mean knowledge score 13.53 on Ill effect of food adulteration. However the overall pre-test mean knowledge was 45.10%, SD as 2.931.

Table: 1.5

MEAN, S.D., RANGE, MEAN SCORE PERCENTAGE OF KNOWLEDGE SCORE AFTER INTERVENTION

S.No.	Aspect of Knowledge	Max possible score	Mean	SD	Range	Mean %
1.	Ill effect of food adulteration	30	21.40	3.590	18	73.33

N=100

Table 1.5: Shows the mean, SD, range, mean score percentage of knowledge score after information booklet i.e. aspect wise post-test mean knowledge of people indicates that mean knowledge score 21.40 on Ill effect of food adulteration. However, the overall post-test mean knowledge was 73.33%, SD as 3.590.

Table 1.6:

ASSESSMENT OF EFFECTIVENESS OF INFORMATION BOOKLET BY COMPARISION OF PRE AND POST TEST KNOWLEDGE SCORE

Aspect of knowledge	Max. Score	Pre-test				Post-test				T Value
		Mean	SD	Range	Mean %	Mean	SD	Range	Mean %	
Ill effect of food adulteration	30	13.53	2.931	17	45.10	21.40	3.590	18	73.33	16.979

N=100

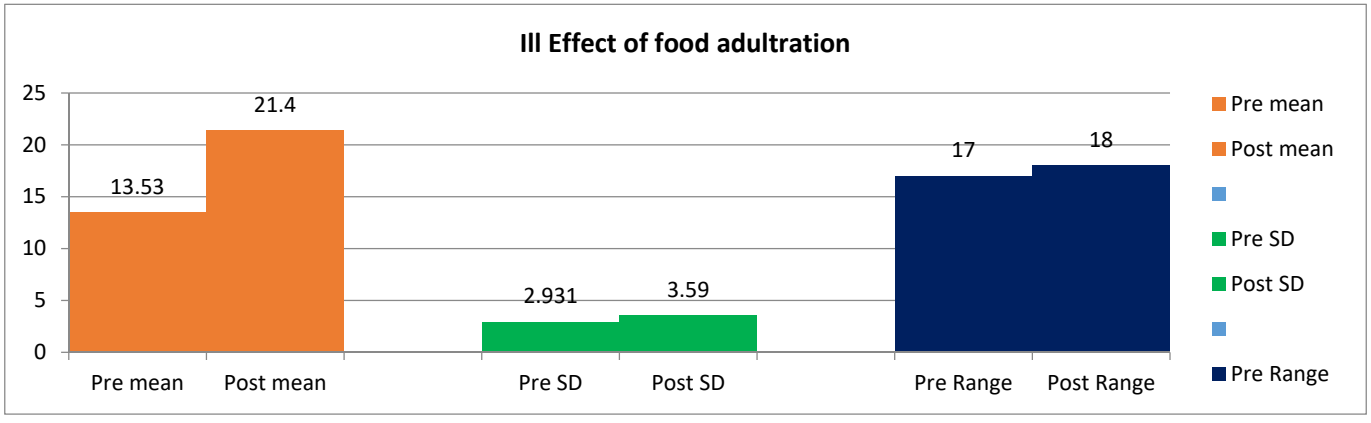

Figure 1.7: Comparison of Mean, SD, Range, of knowledge score before information booklet and after information booklet

Table 1.7: Shows the effectiveness of information booklet by comparing the pre and post-test assessment. In the pre-test knowledge scores was considerably less, compared to post- test performance in all the aspects of knowledge under study. The findings showed that the mean knowledge of post-test mean knowledge score was 21.40 and overall pre-test mean knowledge score was 13.53 of people. However the overall pre and post- test mean % was 45.10 and 73.33 and 't' value 16.979 which is significant at the level of $P < 0.05$. Hence the research hypothesis H_1 stating there is a significant improvement in the knowledge of people regarding Ill effect of food adulteration was accepted.

Table – 1.8

SIGNIFICANCE DIFFERENCE BETWEEN PRE TEST AND POST TEST KNOWLEDGE SCORE

S. No.	Score	Mean	S.D	Std. Error	Mean Difference	DF	Calculated "t" value	Tabulate value
1.	Pre- Test	13.53	2.931	0.293	7.87	99	16.979	1.660
2.	Post-Test	21.40	3.590	0.359				

N=100

Table 1.8: shows the significant difference between pre and post-test knowledge score i.e. in Pre-test mean ±SD 13.53±2.931 and in Post- test 21.40±3.590 and there mean difference is (7.87) and the t-ratio was statistically significant as the obtained value (16.979) is higher than the tabulated value (1.660) required for t-ratio to be significant at 0.05 level of significance.

ASSOCIATION BETWEEN POST-TEST LEVELS OF KNOWLEDGE WITH DEMOGRAPHIC VARIABLES.

The results revealed that there was no significant association between the post-test levels of knowledge regarding the ill effects of food adulteration and the selected demographic variables such as age, gender, education, and occupation. The Chi-square values obtained were less than the

tabulated values at the 0.05 level of significance, indicating that the improvement in knowledge was independent of the demographic characteristics of the participants.

SUMMARY

This chapter has discussed the significant findings of the study in relation to other studies. This study along with other studies have shown that the information booklet were effective in increasing the knowledge of the people and their demographic variables had no significant affect on the knowledge level regarding ill effects of food adulteration.

CONCLUSION

The main aim of the study was to assess the knowledge of people regarding information booklet and to improve their knowledge about ill effects of food adulteration. The knowledge of people was improved by a information booklet. The following conclusions were drawn based on the findings of the study.

Assessment of the level of pre test knowledge score among people depicts that, out of 100 subjects majority 86% (86) had In-adequate, 16% (16) has moderate knowledge and 2% (02) has adequate knowledge regarding Ill effect of food adulteration. After information booklet (post-test), out of 100 subjects 09% (09) had In-adequate, 54% (54) has moderate knowledge and 37% (37) has adequate knowledge related to knowledge related to Ill effect of food adulteration, which means that health education programme was effective.

The knowledge scores of people regarding ill effects of food adulteration has revealed that, the findings shows the mean, SD, range, mean score percentage of knowledge score before information booklet i.e. aspect wise pre-test mean knowledge of people indicates that mean knowledge score 13.53 on Ill effect of food adulteration. However the overall pre-test mean knowledge was 45.10%, SD as 2.931 and the mean, SD, range, mean score percentage of knowledge score after information booklet i.e. aspect wise post-test mean knowledge of people indicates that mean knowledge score 21.40 on Ill effect of food adulteration. However the overall post-test mean knowledge was 73.33%, SD as 3.590. So the result shows the significant difference between pre and post-test knowledge score i.e. in Pre-test mean ±SD 13.53±2.931 and in Post- test 21.40±3.590 and there mean difference is (7.87) and the t-ratio was statistically significant as the obtained value (16.979) is higher than the tabulated value (1.660) required for t-ratio to be significant at 0.05 level of significance.

Association of demographic variables with pre test scores was computed using chi- square test. Analysis has shown that, there was no association between the pre test knowledge score and demographic knowledge.

Thus, the finding indicates that there is lack of knowledge among people regarding information booklet and information through various means like information booklet is a useful source for improving the knowledge.

REFERENCES

1. Abidfatheem TK, Baby SN, Maxie Andrade. Food adulteration and family knowledge on food adulteration in selected villages of Udupi taluka, Karnataka. The Nitte University Journal Of Health Science.[serial online].June 2013 [cited on 2013 Dec 5]; 3(2): 33-37. Available from URL: http://nitte.edu.in/journal/june2013/faafk.pdf
2. Howes M, McEwen S, Griffiths M, Harris L. Food handler certification by home study: Measuring changes in knowledge and behavior. Dairy, Food Environ Sanit. 1996;16(11):737–744
3. Sudershan RV, Prtima Rao, Kalpagam Polasa. Food Safety Research in India; a review. The Asian Journal Of Food and Agro-Industry.[serial online]. 2009[cited on 2013 Dec 4];2(03):412-433. Available from URL: http://www.ajofai.info
4. Manjula Takur, Indrajit Walia, Amarjit Singh. Impact of health education package on knowledge and practices of women regarding food adulteration. The Nursing and Midwifery Research Journal.[serial online]. January 2009 [cited on 2013 Dec 6];5(1):1-9. Available from URL: http://medind.nic.in/nad/t09/i1/nadt09i1p1.pdf
5. Park K. Preventive and Social Medicine. 20th ed. M/s Banarsidas Bhanot Publishers Jabalpur. P.572-573
6. Laxmi V, LABS RV. Food Adulteration. The International Journal Of Science Inventions Today.[serial online].November-December 2012 [cited on 2013 Dec 5];1(2):106-113. Available from URL:http://www.ijsit.com/admin/ijsit
7. Bhamare YR et al. (2016). Impact of Milk Adulteration On Food Safety And Human Health In India: A Review. World Journal Of Pharmacy And Pharmaceutical Sciences, Volume 5, Issue 8, 636-644. DOI: 10.20959/wjpps20168-7480.
8. Beniwal A, Khetarpaul N. Knowledge of consumers regarding the nature and extent of adulteration of Indian foods. Nutrition Health.[serial online]. 2002[cited on 2013 Dec 04];13(3):153-60. Available from URL: http://www.ncbi.nlm.nih.gov/pubmed/10561864
9. Kalra, R.L. et al. (1999). DDT and HCH residues in dairy milk samples collected from different geographical regions of India: a multicentric study. Food Add and Contaminants. 16(10): 411-417.
10. Bhaskar, J., Usman, M., Smitha, S. and Bhat, G.K. (2004). Bacteriological profile of street foods in Managlore. Indian J. of Medical Microbiology. 22(3) : 197.
11. Beniwal, A. and Khetarpaul, N. (1999) Knowledge of consumers during regarding the nature

and extent of adulteration of Indian foods. Nutrition Health.13(3) :153-160. Available from URL: http://www.ncbi.nlm.nih.gov/pubmed/10561864

12. Singh Anita, Bhatt, Shuchi Rai and Bhatt, Sheeendra M. (2010). Food adulteration and practices in urban area of Varanasi, Food Science Research Journals., 1 (2): 183-195. Available from URL: http://www.iosrjournals.org/iosr-jestft

13. Jaiswal PK. Common food adulterants in food and simple screening test for their detection.[serial online].Nagpur;2006[cited on 2013 Dec 7]. Available from URL: http://agmarknet.nic.in/adulterants.htm

14. Nidhi Gupta and Priti Panchal. Extent of Awareness and Food Adulteration Detection in Selected Food Items Purchased by Home Makers. Pak J of Nut. [serial online]. 2009[cited on 2013 Dec 05];8(5):660-667. Available from URL: http://scialert.net/asci/ascidetail.

15. Nidhi Gupta and Priti Panchal. Extent of Awareness and Food Adulteration Detection in Selected Food Items Purchased by Home Makers. Pak J of Nut. [serial online]. 2009[cited on 2013 Dec 05];8(5):660-667. Available from URL: http://scialert.net/asci/ascidetail.

16. Polit FD, Cheryl TB. Nursing Research. 8th ed. New York, Lippincott. P.105-106.

17. Dr. Rita et al. (2016). The Impact of Controversy of "Nestle's Maggi" On Consumers and The Company. 1(1), 01-06(2016). Available from URL: http://www.gc11.ac.in/wp-content/uploads/2017/02/5research-paper-rita-2-1.pdf

18. Sharma A. Food Adulteration: A Review. International Journal for Research in Applied Science & Engineering Technology (IJRASET) [Internet]. 2017Mar;5(III). Available from: https://www.researchgate.net/publication/322577275_Food_Adulteration_A_Review

19. Polit DF, Hungler BP. Nursing research: Principles and methods. 3rd edition. Philadelphia:JB Lippincott Company; 2008.

20. George JB.Nursing theories:The base for professional nursing practice.2nd ed.New Jersey: Pearson Education Inc;2007.

21. Basavanthappa BT. Nursing theories. New Delhi: Jaypee Brothers Medical Publishers Ltd; 2009

22. Ishwar S, Dudeja P, Shankar P, Swain S, Mukherji S. 'Jago Grahak Jago': A cross-sectional study to assess awareness about food adulteration in an urban slum. Med J Armed Forces India. 2018 Jan;74(1):57-60. doi: 10.1016/j.mjafi.2016.11.007. Epub 2016 Dec 27. PubMed PMID: 29386733; PubMed Central PMCID: PMC5771762.

23. Tiwari, D. (2016). A STUDY ON FOOD ADULTERANTS AND AWARENESS ABOUT ADULTERATION AMONG STUDENT OF GORAKHPUR DISTRICT. International Education And Research Journal, 2(5). Retrieved from http://ierj.in/journal/index.php/ierj/article/view/264

24. Nagvanshi D. et al. (2015). A Study on Common Food Adulterants and Knowledge about Adulteration among Women of Rae Bareli District. International Journal of Home Science 2015; 1(3): 05-08. Available from: www.homesciencejournal.com.

25. Vaishali Dhanvijay , Maharashtra assessment of students awareness about food adulteration 2015,pp: 2344-2355 Available from URL: ijifr.com/pdfsave/31-03-2015410V2-E7-097.pdf

26. Monica Woldt Washington, Literature Review on Effective Food Hygiene Interventions for Households in Developing Countries, DC, 2015 https://www.popline.org/node/657991

27. Al Mamun M, Rahman SM, Turin TC. Knowledge and awareness of children's food safety among school-based street food vendors in Dhaka, Bangladesh. Foodborne Pathog Dis. 2013 Apr;10(4):323-30. doi: 10.1089/fpd.2012.1283. Epub 2013 Mar 4. PubMed PMID: 23458028.

28. Nayak Baby et al. (2013). Food Adulteration and Family's Knowledge On Food Adulteration In Selected Village Of Udupi Taluk, Karnataka. Nitte University Journal of Health Science. 3(2): 2013. Available from URL: https://www.researchgate.net/publication/293464712.

29. Dr. Hawa Singh, Kurukshetra, Consumer Perception towards the Quality Marks of Products, 2013, pp: 50-53, www.irjcjournals.org/ijmssr/sep2013/9.pdf

30. Shridhar Dwivedi, *Delhi,* Commonly used smokeless tobacco preparations in & around a tertiary hospital in India, pp- 836-841, 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3573606/

31. Nasreen S, Ahmed T. Food adulteration and consumer awareness in Dhaka City, 1995-2011. J Health Popul Nutr. 2014 Sep;32(3):452-64. PubMed PMID: 25395908; PubMed Central PMCID: PMC4221451.

32. Subba Rao GM, Sudershan RV, Rao P, Vishnu Vardhana Rao M, Polasa K. Food safety knowledge, attitudes and practices of mothers: findings from focus group studies in South India. Appetite. 2007 Sep;49(2):441-9. Epub 2007 Mar 12. PubMed PMID: 17448570.

33. Nasreen S, Ahmed T. Food adulteration and consumer awareness in Dhaka City, 1995-2011. J Health Popul Nutr. 2014 Sep;32(3):452-64. PubMed PMID: 25395908; PubMed Central PMCID: PMC4221451.

34. Nidhi Gupta and Priti Panchal, 2009. Extent of Awareness and Food Adulteration Detection in Selected Food Items Purchased by Home Makers. Pakistan Journal of Nutrition, 8: 660-667. DOI: 10.3923/pjn.2009.660.667. URL: https://scialert.net/abstract/?doi=pjn.2009.660.667.

35. Y. R. Bhamare, Nashik, India impact of milk adulteration on food safety and human health in India, 2016, pp-636-644, www.wjpps.com/download/article/1470114528.pdf

36. GM Masud Parvez, Bangladesh, Alternation of antimicrobial potential of mango peel and pulp after formalin treatment against six bacteria, pp-158-161,(2016) www.phytojournal.com/archives/2016/vol5issue5/PartC/5-5-14-953.pdf

37. J. K. Swathi, Hyderabad, India, A study on adulteration of milk and milk products from local vendors, 2015, pp-678-681 www.ssjournals.com/index.php/ijbar/article/download/2506/1967

38. Nath, P. P., Sarkar, *West Bengal* ,Practice of using metanil yellow as food colour to process food in unorganized sector, 2015, *PP*-1424-1428, www.ifrj.upm.edu.my/22%20(04)%202015/(16).pdf