



# Assessment of Knowledge, Attitude, and Practices (KAP) of Anganwadi Teachers and Asha Workers with Regard to Nutrition Education Intervention

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

Nutrition is one of the important aspects that deals with good health and wellbeing of people. Nutrition education helps to resolve the nutrition problems by imparting nutrition education and bring desirable changes in terms of Knowledge, Attitude and Practices (KAP). The existing study was

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conducted to know the knowledge, attitude, and practices of AWW and ASHA's with regard to nutrition education for pregnant women and lactating mother. Data was gathered using pre-tested questionnaires with a sample size of 90 respondents chosen from three mandals/Blocks (area) in the Guntur district. Random sampling procedure was used for selection of the respondents. The results of the study found that Anganwadi teachers and ASHA Workers had low to medium level of knowledge, poor attitude and poor practices during baseline test. After implementing intervention programme to the Anganwadi teachers and ASHA Workers for a period of one month a significant improvement in the Knowledge, Attitude and Practices was observed during Endline test ( $t=10.5$ ;  $t=10.3$ ). The above findings can be used to plan a digital material on nutrition education interventions which aiming at bringing change in the behavior of the respondents i.e., KAP and it can be used as ready reckoners during sudden epidemics.

*Keywords: Anganwadi teachers; ASHA workers; baseline; endline; KAP; nutrition education interventions.*

## 1. INTRODUCTION

Nutritional status is one of the key indicator of health of a pregnant and lactating mothers. Nutrition is a discipline, which is directly connected with number of other areas associated to human existence like agriculture, economics, medicine, food technology, engineering, biological sciences, sociology, anthropology etc.

Nutrition education is a critical aspect for better and healthy life and is defined as "set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviours favourable to health and well-being" [1] which is interchangeably called as social marketing, behaviour change communication, community nutrition and health promotion.

Nutrition education should be practical and easily adaptable by inculcating food habits with available local food resources [2]. Nutrition education should become a part of the community as it is very critical in determining the health status of the community. The function of a nutrition education is to resolve the nutritional difficulties among the people through imparting knowledge and bring desirable change in knowledge, practices and attitude [3].

Nutrition education is one of the services that comes under ICDS & Health departments which are implemented by AWW & ASHA's at village level. They are the frontline disseminators of science-based facts related to nutrition. Hence, they need to be provided with right information and right perspective using right methodologies in order to transfer the message in an understandable manner to the ultimate users.

Nutrition education intervention is described as consciously planned actions aimed at improving

a nutrition-related behaviour or component of health status for an individual, a target group, or the entire community.

Anganwadi centre is the nodal point for the delivery of ICDS Services, whereas Health sub-centres are the focal points of health sub centres AWW and ASHA Worker are the frontline workers working at field level in the village with prime role to take care of children, pregnant & lactating mothers. Assessment of their knowledge regarding nutrition to pregnant women & lactating mothers will identify the knowledge and implementation gaps that can be addressed by appropriate training to provide better services to the beneficiaries.

Accredited Social Health Activist (ASHA) is a community health worker employed by the Ministry of Health and Family Welfare (MoHFW) as a part of India's National Rural Health Mission (NRHM). They mobilise the people for participation towards increased utilisation and accountability of the existing health services. The responsibilities of ASHA workers include survey of health & related events, community sensitisation on government programmes, counselling, community mobilisation, health planning and immunization [4]. The outcomes of the research will be considered while framing for the appropriate education intervention suitable for the frontline disseminators in the Indian health delivery system.

## 2. MATERIALS AND METHODS

The present study was conducted in three purposively selected mandals of the Guntur district of Andhra Pradesh. Thirty respondents comprising of 15 Anganwadi Teachers and 15 ASHA Workers from each mandal thus making a sample of Ninety (90) respondents from three

mandals were selected. An experimental research design was adopted to study the Knowledge, Attitude and Practices (KAP) of Anganwadi Teachers and ASHA Workers with regard to nutrition education intervention. To test the KAP, a structured questionnaire with 47 multiple-choice questions was developed. Correct answers received a score of 1, and incorrect responses received a score of 0. Therefore, the maximum and lowest possible scores for each respondent might be 47 and 1, respectively, while the digital literacy test consisted of questions and employed a 3-point continuum. Further by using mean and Standard Deviation as a measure of check, the respondents were categorized as low, medium and high. The data was analyzed using Statistical Packages for Social Sciences Software (SPSS) to find the frequency, percentages, Mean scores and t-test. The content was delivered in four sessions, two offline and two online, over a one-month intervention period, with each session lasting a week.

### 3. RESULTS AND DISCUSSION

The profile characteristic of ASHA Worker and AWW was includes Age, Education, Experience,

Marital Status, Digital Literacy and Mass media exposure. The results were depicted in Table 1.

Majority of the respondents belong to 35 – 45 years age group, this might be due to the time of recruitment of the post. The other reason might be that people in middle age between 35 to 45 years are more likely to acquire new information and also possess responsibility to share the information and discharge their duties effectively especially in educating lactating and pregnant mothers when compared to the young and old age people. The above results are in line with Khoisnam et al. [5].

Majority of the Anganwadi teachers had completed intermediate education (42.22%) and nearly three-fourth (73.34%) of the ASHAs had completed secondary level school.

With regard to ASHAs seventy-three per cent have completed secondary level of education who had interacted with the investigator and expressed their knowledge, attitude and practices. The reason might be minimum eligibility qualification for ASHAs was revised from primary level to secondary level of education which made them to acquire and possess higher level of education.

**Table 1. Profile characteristics of the respondents**

S. No	Variables	n=90			
		Anganwadi Teacher		ASHA Worker	
		Frequency	%	Frequency	%
<b>Age</b>					
1	Below 35 Years	19	42.22	9	20.00
2	35-45Years	21	46.66	27	60.00
3	Above 45 Years	5	11.12	9	20.00
<b>Educational Qualification</b>					
1	Secondary Level	13	28.89	33	73.34
2	Intermediate	19	42.22	10	22.22
3	Graduation	13	28.89	2	4.44
<b>Work Experience</b>					
1	Below 5Years	6	13.33	6	13.33
2	Between 5-10 Years	8	17.78	23	51.12
3	Above 10 Years	31	68.89	16	35.55
<b>Marital Status</b>					
1	Unmarried	1	2.22	1	2.22
2	Married	39	86.67	44	97.78
3	Divorced	4	8.89	0	0.00
4	Widowed	1	2.22	0	0.00
<b>Digital Literacy</b>					
1	Low	4	8.88	5	11.12
2	Medium	27	60.00	29	64.44
3	High	14	31.12	11	24.44
		Mean-2.18		Mean-2.15	
		SD-0.70		SD-0.80	

S. No	Variables	n=90			
		Anganwadi Teacher		ASHA Worker	
		Frequency	%	Frequency	%
<b>Mass media Exposure</b>					
1	Low	8	17.78	17	37.78
2	Medium	25	55.55	16	35.55
3	High	12	26.67	12	26.67
		Mean-1.99		Mean-1.93	
		SD-0.87		SD-0.79	

Results depicted that majority (68.89%) of the Anganwadi teachers had more than 10 years of experience whereas in ASHA Workers 51.12 per cent of the them had 5-10 years of experience. When compared to ASHAs, AWWs have more work experience and the reason might be due to year of initiation of project and scheme. ICDS is one of the age-old projects implemented in India whereas the posts of ASHAs were created under NHM in the year 2005. The above results are in line with Catherine et al. [6] and Bhagia et al. [7].

The above results are in line with Usha et al. [8].

Results reported that more than half of the respondents of both Anganwadi Teachers (60.00%) and ASHAs (64.44%) fell under medium digital literacy. The reason for having medium to high digital literacy among both

Anganwadi Teachers and ASHAs might be due to their regular usage of Tabs/Androids for the purpose of reporting, interacting and intimation to their superiors and peers. The government had provided every extension functionary with digital gadgets as part of e- Governance in India which was made mandatory to share the daily reports with the images and videos as evidence.

It was apparent that more than fifty (55.55%) per cent of the Anganwadi teachers had medium media exposure, while 37.78 per cent of ASHA's had low exposure to media. The results indicated that AWWs have medium to high mass media exposure. This might be due to their I level of education and experience when compared to the ASHAs who have low to medium mass media exposure. These are in lines with Geetha [9].

**KAP of Anganwadi teachers and ASHA workers:**

**Table 2. Responses of Anganwadi teachers and ASHA workers to knowledge questionnaires on nutrition education**

Q. No	Statement	n=90							
		Baseline test				Endline test			
		Anganwadi Teachers F (%)				ASHA Workers F (%)			
Yes	No	Yes	No	Yes	No	Yes	No		
1	What are the long-term consequences for the children born to Gestational Diabetes Mellitus (GDM) mothers?	19 (42.22)	26 (57.78)	35 (77.78)	10 (22.22)	26 (57.78)	19 (42.22)	35 (77.78)	10 (22.22)
2	Gaining too much weight during pregnancy can raise the risk of	19 (42.22)	26 (57.78)	35 (77.78)	10 (22.22)	34 (75.56)	11 (24.44)	41 (91.12)	4 (8.88)
3	What happens, if a pregnant women has folic acid deficiency?	32 (71.11)	13 (28.89)	36 (80.00)	9 (20.00)	26 (57.78)	19 (42.22)	34 (75.56)	11 (24.44)
4	What is the normal blood pressure of a pregnant women?	24 (53.33)	21 (46.67)	39 (86.66)	6 (13.33)	27 (60.00)	18 (40.00)	34 (75.56)	11 (24.44)
5	What is the formula used to calculate the date of delivery?	34 (75.56)	11 (24.44)	41 (91.12)	4 (8.88)	28 (62.22)	17 (37.78)	34 (75.56)	11 (24.44)
6	Reasons for introducing weaning food	27 (60.00)	18 (40.00)	34 (75.56)	11 (24.44)	17 (37.78)	28 (62.22)	35 (77.78)	10 (22.22)

7	Frequency of growth monitoring	19 (42.22)	26 (57.78)	35 (77.78)	10 (22.22)	35 (77.78)	10 (22.22)	41 (91.12)	4 (8.88)
8	What are the vaccines that should be given to new-borns?	25 (55.56)	20 (44.44)	36 (80.00)	9 (20.00)	36 (80.00)	9 (20.00)	40 (88.89)	5 (11.12)
9	Colostrum is important for the baby to maintain immunity	19 (42.22)	26 (57.78)	35 (77.78)	10 (22.22)	29 (64.44)	16 (35.55)	41 (91.12)	4 (8.88)
10	Time of Initiation of breastfeeding	19 (42.22)	26 (57.78)	26 (57.78)	19 (42.22)	17 (37.78)	28 (62.22)	35 (77.78)	10 (22.22)
11	Are you aware of benefits of millet and millet products for pregnant women?	19 (42.22)	26 (57.78)	28 (62.22)	17 (37.78)	17 (37.78)	28 (62.22)	35 (77.78)	10 (22.22)
12	Which of the following contains rich in calcium?	35 (77.78)	10 (22.22)	41 (91.12)	4 (8.88)	17 (37.78)	28 (62.22)	34 (75.56)	11 (24.44)
13	Which of the following food items that comes under vitamin-c rich foods?	30 (66.67)	15 (33.33)	41 (91.12)	4 (8.88)	17 (37.78)	28 (62.22)	35 (77.78)	10 (22.22)
14	Why lactating mothers will not consume millet-based food products?	28 (62.22)	17 (37.78)	35 (77.78)	10 (22.22)	30 (66.67)	15 (33.33)	41 (91.12)	4 (8.88)
15	During pregnancy, hypothyroidism can lead to	19 (42.22)	26 (57.78)	34 (75.56)	11 (24.44)	26 (57.78)	19 (42.22)	41 (91.12)	4 (8.88)
16	What is the normal blood sugar for a pregnant woman?	24 (53.33)	21 (46.67)	36 (80.00)	9 (20.00)	17 (37.78)	28 (62.22)	41 (91.12)	4 (8.88)
17	What is the normal BMI range for pregnant women?	26 (57.78)	19 (42.22)	39 (86.66)	6 (13.33)	17 (37.78)	28 (62.22)	43 (95.56)	2 (4.44)
18	Which of the following foods are provided in YSR Sampoorna Poshana Scheme?	35 (77.78)	10 (22.22)	43 (95.56)	2 (4.44)	17 (37.78)	28 (62.22)	40 (88.89)	5 (11.12)

\*Value in parenthesis indicates the percentage

**Baseline Test:** The response of Anganwadi Teachers to the knowledge questionnaire on nutrition education is presented in Table 2. More than 70% of the respondents have good knowledge (answering right) on each of four statements out of 18. The following statements 3 had 71.11 per cent has answered right; 75.56 per cent has answered correctly for statement 5; statement 12&18 had an equal percentage i.e., 77.78 per cent. On the other side, more than 50 per cent of the Anganwadi teachers lack knowledge of nutrition education (answering wrong) on seven statements out of 18. These are statements 1, 2, 7, 9, 10, 11 & 15 all had an equal percentage (57.78%) of the respondents.

The response of ASHA workers to the knowledge questionnaire on nutrition education is presented in Table 2. Over more than 70 per cent of the respondents have good knowledge (answering right) on each of three statements out of 18. These are statement 2 had 75.56 per cent; statement 7 had 77.78 per cent and statement 8

had 80.00 per cent. On the other side, more than 60 per cent of the ASHA Workers lacks knowledge of nutrition education (answering wrong) on eight statements out of 18. These statements are 6, 10,11,12,13,16,17&18 all had an equal percentage (62.22%).

The reason might be due to lack of knowledge on nutrition education and the probable reason might be due to their low level of education and various other factors like their age, the effectiveness of training, lack of continuing education, years of experience, motivation by supervisors, lack of incentives, etc. This view of them suggests that Anganwadi teachers know about the government schemes like YSR sampoorna poshana and poshan tracker because they are bringing awareness on these schemes among the people who are eligible for this scheme especially pregnant women and lactating mothers and they are aware of the benefits of millets not for the product development and lacks knowledge on vaccines

for new-borns and pregnant women, pregnancy risks, etc. While ASHA Workers know about pregnancy risks, growth monitoring frequencies, and also vaccines for pregnant and new-borns and lack knowledge on some of the aspects that they won't deal with their people.

**Endline Test:** The response of Anganwadi Teachers to the knowledge questionnaire on nutrition education is presented in Table 2. Over more than 80 per cent of the respondents have good knowledge (answering right) on each of nine statements out of 18. These are statements are 3,4,5,8,12,13,16,17,18. On the other side, more than 20 per cent of the Anganwadi teachers lack knowledge of nutrition education (answering wrong) on twelve statements out of 18. These are statements are 1,2,3,6,7,8,9, 10,11,14,15&16.

The response of ASHA workers to the knowledge questionnaire on nutrition education is presented in Table 2. Over more than 90 per cent of the respondents have good knowledge (answering right) on each of seven statements out of 18. These are statements are 2,7,9,14,15,16&17. On the other side, more than 20 per cent of the ASHA Workers lacks knowledge of nutrition education (answering wrong) on nine statements out of 18. These statements are 1,3,4,5,6,10, 11,12,13.

**Baseline Test:** The response of Anganwadi Teachers to the Attitude questionnaire on nutrition education is presented in Table 3. Over 70 per cent of the responses have a positive attitude (answering right) on each of two statements out of 9. These statement 7 had 75.56 per cent; statement 8 had 77.78 per cent. On the other side, more than 60 per cent of the Anganwadi teachers have a negative attitude (answering wrong) related to nutrition education and agreed with five statements out of 9 and Statements 1, 2,4,6 &9 all had an equal percentage (66.67%).

The response of ASHA Workers to the Attitude questionnaire on nutrition education is presented in Table 3. Over more than 60 per cent of the respondents have a positive attitude (answering right) on each of two statements out of 9. This are statement 3 had 60.00 per cent; statement 8 had 73.33 per cent. On the other side, more than 60 per cent of the ASHA Workers have a negative attitude (answering wrong) related to nutrition education on five statements out of 9.

These statements are 1,2,4,6&9 all had an equal percentage (68.89%).

It also might be due to their low level of education and various other factors like their age, the effectiveness of training, lack of continuing education, motivation by supervisors, personal attitude, etc. This perspective suggests that the main role of Anganwadi teachers is to provide supplementary nutrition and educate the people (in particular women) for bringing awareness on nutrition and they lack some medically related information. While ASHA workers know the information related to medical and some are aware and unaware of nutrition-related information that is helpful for pregnant women and lactating mothers.

**Endline Test:** The response of Anganwadi Teachers to the knowledge questionnaire on nutrition education is presented in Table 3. Over more than 80% of the respondents have good knowledge (answering right) on each of six statements out of 9. These are statements are 3,5,6,7,8&9. On the other side, more than 60 per cent of the Anganwadi teachers have a negative attitude (answering wrong) related to nutrition education and agreed with six statements out of 9 and statements are 1,2,3,4,6 & 9.

The response of ASHA Workers to the Attitude questionnaire on nutrition education is presented in Table 3. Over more than 80 per cent of the respondents have a positive attitude (answering right) on each of six statements out of 9. These statements are 3,5,6,7,8&9. On the other side, more than 20per cent of the ASHA Workers have a negative attitude (answering wrong) related to nutrition education on five statements out of 9. These statements are 1, 2, 3, 4 & 9.

**Baseline Test:** The response of Anganwadi Teachers to the Practice questionnaire on nutrition education is presented in Table 4. Over 55 per cent of the responses have good practices (answering right) on each of five statements out of 20. These are statements 1,2,11&15 had an equal percentage (55.56%) and statement 8 had 51.12 per cent. On the other side, more than 65 per cent of the Anganwadi teachers have poor practices (answering wrong) related to nutrition education and agreed with eleven statements out of 20 and Statements are 3,4,5,6,7,9,10,12,13,14 &20 all had an equal percentage (66.67%).

**Table 3. Responses of Anganwadi Teachers and ASHA Workers to Attitude questionnaires on Nutrition Education**

Q. No	Statement	n=90							
		Baseline test		Endline test		Baseline test		Endline test	
		Anganwadi Teachers F (%)				ASHA Workers F (%)			
	Yes	No	Yes	No	Yes	No	Yes	No	
1	Do you think breastfeeding improves infant brain development?	15 (33.33)	30 (66.67)	35 (77.78)	10 (22.22)	14 (31.11)	31 (68.89)	35 (77.78)	10 (22.22)
2	Do you think millets are not recommended food for pregnant women and lactating mothers?	15 (33.33)	30 (66.67)	35 (77.78)	10 (22.22)	14 (31.11)	31 (68.89)	35 (77.78)	10 (22.22)
3	How good do you think it is to eat more food during pregnancy/lactation?	28 (62.22)	17 (37.78)	36 (80.00)	9 (20.00)	27 (60.00)	18 (40.00)	36 (80.00)	9 (20.00)
4	Do you think it is necessary to maintain growth chart for a child?	15 (33.33)	30 (66.67)	30 (66.67)	15 (33.33)	14 (31.11)	31 (68.89)	31 (68.89)	14 (31.11)
5	Are you aware of minced food supplements should be given before the 4 <sup>th</sup> month?	27 (60.00)	18 (40.00)	40 (88.89)	5 (11.12)	25 (55.56)	20 (44.44)	40 (88.89)	5 (11.12)
6	Do you think colostrum contains IgA antibodies that helps to maintain child's immunity?	15 (33.33)	30 (66.67)	36 (80.00)	9 (20.00)	14 (31.11)	31 (68.89)	43 (95.56)	2 (4.44)
7	Lack of green leafy vegetables in the diet for pregnant women will leads to iron deficiency disease	34 (75.56)	11 (24.44)	40 (88.89)	5 (11.12)	26 (57.78)	19 (42.22)	40 (88.89)	5 (11.12)
8	How good do you think it is to eat vitamin-c foods during pregnancy/lactation?	35 (77.78)	10 (22.22)	43 (95.56)	2 (4.44)	33 (73.33)	12 (26.67)	43 (95.56)	2 (4.44)
9	Do you think it is necessary for gestational diabetes mellitus women to have a blood sugar test performed after delivery?	15 (33.33)	30 (66.67)	36 (80.00)	9 (20.00)	14 (31.11)	31 (68.89)	36 (80.00)	9 (20.00)

*\*Value in parenthesis indicates the percentage*

**Table 4. Responses of Anganwadi teachers and ASHA workers to practice questionnaires on nutrition education**

Q. No	Statement	n=90							
		Baseline test				Endline test			
		Anganwadi Teachers F (%)				ASHA Workers F (%)			
	Yes	No	Yes	No	Yes	No	Yes	No	
1	What is the minimum duration of exclusive Breast Feeding?	25 (55.56)	20 (44.44)	43 (95.56))	2 (4.44)	12 (26.67)	33 (73.33)	35 (77.78)	10 (22.22)
2	At what age supplementary foods need to be started	25 (55.56)	20 (44.44)	40 (88.89)	5 (11.12)	12 (26.67)	33 (73.33)	35 (77.78)	10 (22.22)
3	When do you usually suggest to eat fresh citrus fruits for pregnant women and lactating mothers	15 (33.33)	30 (66.67)	43 (95.56))	2 (4.44)	12 (26.67)	33 (73.33)	35 (77.78)	10 (22.22)
4	Are you demonstrating any millet based food recipes for pregnant women and lactating mothers?	15 (33.33)	30 (66.67)	39 (86.66)	6 (13.33)	12 (26.67)	33 (73.33)	39 (86.66)	6 (13.33)
5	Weight is a good indicator for child's growth	15 (33.33)	30 (66.67)	39 (86.66)	6 (13.33)	30 (66.67)	15 (33.33)	43 (95.56))	2 (4.44)
6	What is the time gap between feedings?	15 (33.33)	30 (66.67)	43 (95.56))	2 (4.44)	29 (64.44)	16 (35.55)	39 (86.66)	6 (13.33)
7	Do pregnant women consume green leafy vegetables during night times suffer with high blood pressure	15 (33.33)	30 (66.67)	39 (86.66)	6 (13.33)	12 (26.67)	33 (73.33)	43 (95.56))	2 (4.44)
8	During pregnancy period should Green Leafy Vegetables taken?	23 (51.11)	22 (48.89)	43 (95.56))	2 (4.44)	24 (53.33)	21 (46.67)	40 (88.89)	5 (11.12)
9	During pregnancy period should Uncooked Sea food taken?	15 (33.33)	30 (66.67)	40 (88.89)	5 (11.12)	12 (26.67)	33 (73.33)	39 (86.66)	6 (13.33)
10	During pregnancy period should Raw papaya taken?	15 (33.33)	30 (66.67)	39 (86.66)	6 (13.33)	12 (26.67)	33 (73.33)	39 (86.66)	6 (13.33)
11	During pregnancy period should Nuts taken?	25 (55.56)	20 (44.44)	43 (95.56))	2 (4.44)	25 (55.56)	20 (44.44)	40 (88.89)	5 (11.12)
12	During pregnancy period should Caeffine taken?	15 (33.33)	30 (66.67)	40 (88.89)	5 (11.12)	12 (26.67)	33 (73.33)	39 (86.66)	6 (13.33)
13	During pregnancy period	15	30	43	2	26	19	40	5



Q. No	Statement	n=90							
		Baseline test		Endline test		Baseline test		Endline test	
		Anganwadi Teachers F (%)				ASHA Workers F (%)			
	Yes	No	Yes	No	Yes	No	Yes	No	
	should soyabean taken?	(33.33)	(66.67)	(95.56)	(4.44)	(57.78)	(42.22)	(88.89)	(11.12)
14	During pregnancy period should alcohol taken?	15	30	40	5	12	33	39	6
		(33.33)	(66.67)	(88.89)	(11.12)	(26.67)	(73.33)	(86.66)	(13.33)
15	During pregnancy period should till seeds?	25	20	43	2	12	33	40	5
		(55.56)	(44.44)	(95.56)	(4.44)	(26.67)	(73.33)	(88.89)	(11.12)
16	During pregnancy period should unpasteurized milk taken?	15	30	40	5	12	33	39	6
		(33.33)	(66.67)	(88.89)	(11.12)	(26.67)	(73.33)	(86.66)	(13.33)
17	During pregnancy period should sweets taken?	23	22	43	2	27	18	43	2
		(51.11)	(48.89)	(95.56)	(4.44)	(60.00)	(40.00)	(95.56)	(4.44)
18	Special foods consumed by mother after delivery	24	21	40	5	12	33	39	6
		(53.33)	(46.67)	(88.89)	(11.12)	(26.67)	(73.33)	(86.66)	(13.33)
19	Along with pregnant and lactating mothers which among the following family household members are consuming YSR Sampoorna Poshana Foods?	23	22	39	6	12	33	39	6
		(51.11)	(48.89)	(86.66)	(13.33)	(26.67)	(73.33)	(86.66)	(13.33)
20	Which of the following value-added products were preferred to prepare and consumption from ragi flour?	15	30	40	5	28	17	39	6
		(33.33)	(66.67)	(88.89)	(11.12)	(62.22)	(37.78)	(86.66)	(13.33)

\*Value in parenthesis indicates the percentage

The response of ASHA Worker to the practice questionnaire on nutrition education is presented in Table 4. Over 60 per cent of the responses have good practices (answering right) on each of four statements out of 20. These are statement 5 had 66.67 per cent; statement 20 had 62.22 per cent; statement 17 “During pregnancy period should sweets taken”, 60.00 per cent; statement 6 had 53.33 per cent. On the other side, more than 70per cent of the ASHA Workers have poor practices (answering wrong) related to nutrition education on twelve statements out of 20. These statements are 1,2,3,4,7,9,10,12,14,15,16 & 19 all had an equal and same percentage (73.33%).

The reason might be due to lack of practices on nutrition education and various other factors like their age, years of experience, lack of incentives etc. The probable reason might be the practices for both Anganwadi teachers and ASHA Workers are poor because they don't have more knowledge and attitude on nutrition education. From this perspective, the clientele who are managing both family and work which obstructs them to gain the information regarding nutrition education practices.

From the above outcomes it could be inferred that ASHA's and AWW Knowledge, Attitude and practices need to be improved. The probable reason might be due to improper training from Department of Integrated Child Development Service (ICDS) and National Health Mission (NHM). These are in line with Amrutha et al. [10].

In the present study majority of the respondents are between 35-45 years and married who can face family and societal conflicts which obstructs them to gain first-hand knowledge from the experts. In addition to this the respondents have medium level of knowledge in digital literacy and low to medium in mass media exposure which impedes them to expose the latest practices. Majority of them are not graduated which is major drawback in understanding the concepts quickly.

**Endline Test:** The response of Anganwadi Teachers to the Practice questionnaire on

nutrition education is presented in Table 4. Over 90 per cent of the responses have hygienic practices (answering right) on each of eight statements out of 20. These are statements are 1,3,6,8,11,13,15&17. On the other side, more than 10 per cent of the Anganwadi teachers have poor practices (answering wrong) related to nutrition education each of twelve statements out of 20. These statements are 2,4,5,7,9,10,12, 14,16,18,19&20.

The response of ASHA Worker to the practice questionnaire on nutrition education is presented in Table 4. Over 85 per cent of the responses have good practices (answering right) on each of seventeen statements out of 20. These are statements are 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 &20. On the other side, more than 20 per cent of the ASHA Workers have poor practices (answering wrong) related to nutrition education each of three statements out of 20. These statements are 1,2 & 3.

These are in line with Taksande et al. [11], Khushbu et al. [12], Usha et al. [8] and Madhusudan et al. [13].

The results clearly evident that there is an improvement in KAP of both AWWs and ASHAs. This might be due to the impact of the nutrition education interventions which aimed at bringing change in the behavior of the respondents i.e., KAP.

It is observed in Table 5 Mean scores obtained from the Baseline test and Endline test were 24.24 and 44.40 respectively in Anganwadi Teachers.

Whereas in ASHA Workers mean scores obtained from the Baseline and Endline tests were 22.87 and 43.24 respectively.

Paired t-test was done to assess the significant difference between Baseline and Endline test scores. In Anganwadi teachers, a significant difference was observed between Baseline and Endline test as t-critical value 2.021 at 5% level of significance and t-statistical value is 10.53\*.

**Table 5. Comparision of nutrition education scores baseline and endline test**

	Variables	Mean scores	t-value
<b>Anganwadi Teachers</b>	Baseline test	24.24	<b>10.5*</b>
	Endline test	44.40	
<b>ASHA Workers</b>	Baseline test	22.87	<b>10.3*</b>
	Endline test	43.24	

\*Indicates significance of value at p=0.05

Whereas in ASHA Workers, a significant difference between Baseline and Endline test as t-critical value 2.021 at 5% level of significance and t-statistical value is 10.34\*. Hence there is a significant improvement in Knowledge, Attitude and Practices (KAP) among the respondents in the areas of nutrition education.

Findings of Taksande et al. [11] also suggests that intervention have positive impact on Nutritional Knowledge, Attitude and Practices of Anganwadi teachers and ASHA Workers.

#### 4. CONCLUSION

Nutrition education is an important element aimed at improving the knowledge on different aspects of nutrition. Nutritional Knowledge, Attitude and Practices (KAP) levels of Anganwadi teachers and ASHA Workers indicate that before Endline test they had low to medium level of knowledge, poor attitude and poor practices. After implementing one month of intervention programme that Anganwadi teachers and ASHA Workers improved their Knowledge, Attitude and Practices during Endline test. A significant difference found in the Baseline and endline test intervention scores in the areas of nutrition education intervention that directly contributes to better maternal and child health outcomes at the grassroots level.

#### DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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