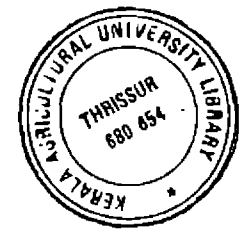
EFFECT OF TRAINING ON FOOD SAFETY MEASURES TO THE ANGANWADI HELPERS OF ICDS



BY

JAIMY SURESH

THESIS
SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF
MASTER OF SCIENCE IN HOME SCIENCE
(FOOD SCIENCE AND NUTRITION)
FACULTY OF AGRICULTURE
KERALA AGRICULTURAL UNIVERSITY

DEPARTMENT OF HOME SCIENCE
COLLEGE OF AGRICULTURE
VELLAYANI
THIRUVANANTHAPURAM

2001

DECLARATION

I hereby declare that this thesis entitled **"Effect of training on food safety measures to the anganwadi helpers of ICDS"** is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title, of any other university or society.

Vellayani,
9-11-2001

Jaimy Suresh

CERTIFICATE

Certified that this thesis entitled **"Effect of training on food safety measures to the anganwadi helpers of ICDS"** is a record of research work done independently by Ms. Jaimy Suresh (98-16-08) under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to her.

Vellayani,
9 - 11 -2001

Mrs. P. Geetha
(Chairman, Advisory Committee)
Assistant Professor
Department of Home Science
College of Agriculture, Vellayani
Thiruvananthapuram

APPROVED BY

CHAIRPERSON

Mrs. P. Geetha,
Assistant Professor,
Department of Home Science,
College of Agriculture, Vellayani.

9/11/2001

MEMBERS

Dr. (Mrs) L. Prema,
Professor and Head,
Department of Home Science,
College of Agriculture, Vellayani.

9-11-01

Dr. (Mrs.) Kumari N.P. Sushama,
Associate Professor,
Department of Agricultural Extension,
College of Agriculture, Vellayani.

9-11-01

Dr. (Mrs.) S. Syamakumari,
Associate Professor,
Department of Home Science,
College of Agriculture, Vellayani.

9-11-2001

EXTERNAL EXAMINER

9.11.01

Dr K. S. Kuma
Prof & Head
Dept of Home Scien
St Thomas's College Ernakul

ACKNOWLEDGEMENT

From deep within my heart, I extend my profound and unbounded gratitude to Mrs. P. Geetha, Assistant Professor, Department of Home Science, Chairman of the Advisory committee for her valuable guidance, critical scrutiny of the manuscript, creative suggestions and sustained interest. I am indebted to her for her constant encouragement ever willing help, moral support and affection rendered during the entire course of study.

My sincere thanks to Dr. (Mrs.) L. Prema, Professor and Head, Department of Home Science for her valuable suggestions wholehearted help and constructive perusal of manuscript.

I owe my indebtness to Dr. (Mrs.) Kumari N.P. Sushama, Associate professor, Department of Agricultural Extension for her constant help timely advice and encouragement extended throughout the study.

I sincerely thank Dr. (Mrs.) Shyamakumari, Associate Professor, Department of Home Science for her genuine interest, timely help and friendly approach through out the course of study.

I avail this opportunity to place my deep sense of gratitude to Mr. C.E. Ajith, Junior programmer, Department of Agricultural statistics for his help in analyzing experimental data.

I extend my sincere thanks to the teaching and non-teaching staff of the Department of Home Science.

I gratefully acknowledge Kerala Agricultural University for granting me the Kerala Agricultural University Junior fellowship.

I gratefully acknowledge Kerala Agricultural University for granting me the Kerala Agricultural University Junior fellowship.

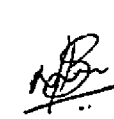
I am also thankful to Biju.P. and Sindhu, ARDRA computers for the neat and timely preparation of the thesis.

I am unable to express my deep sense of gratitude to my dear friends Rani and Smitha. I fondly remember their love, affection, kindness and sincerity which added rhythm to my life.

My sincere thanks to my hostel friends Praveena chechi, Sindhu chechi, Beena and Dhanya. I am also thankful to my juniors Seenia, Roopa, Preethi, Gayathri, Shalini, Bhavani and Thara.

Words fail to express my gratitude to my mother, father and Jaisy. Their glorious love illuminated my world and I am blissful to have them as mine.I am beholden to my dear cousins Rakhi, Sheji, Roshni and Bindhya.

Above all, I bow before God Almighty, the All merciful for all the blessings showered on me.



Jaimy Suresh

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

LIST OF APPENDICES

Sl. No	Title	Appendix No.
1.	Interview schedule to collect information regarding socio-economic and personal profile of the respondents	I
2.	The training schedule for three days training on food safety measures	II
3.	Statement to test the knowledge on food safety measures	III
4.	Statement to test the attitude on food safety measures	IV
5.	Statement to test the practice on food safety measures	V
6.	Observation schedule to collect the information regarding the infrastructure facilities of the anganwadi centres	VI

Introduction

1. INTRODUCTION

Food is essential for growth and maintenance of health. But food can perform the basic function only if it is safe.

Food safety implies cleanliness in producing, preparing, storing and serving of food and water. To ensure food safe for consumption, safe and potable water supply, selection of wholesome ingredients and hygienic handling to prevent the entry of spoilage and pathogenic organisms, both during preparation and serving are essential (Sumati and Rajagopal, 1993).

Food hygiene covers all measures necessary to ensure the safety, wholesomeness and soundness of food at all stages from its growth, production or manufacture, until its final consumption.

Hence hygiene and sanitation play a vital role in promoting the health and well being of our community. Although the concept of environmental cleanliness and purity of water are not unfamiliar to our community, there is a strong need to strengthen the hygienic practices related to food and water supply. As per the report of Healthy Home Advisory Services (1999) hygiene is essential for those who come into close contact with young children especially care providers to practice the highest standards of hygiene to control the spread of germs and bacteria. Care providers should ensure that children wash their hands when they arrive, before they eat or drink and after they use the toilet.

With the prevailing high rate of infant mortality, children in the age group of 0-6 years form the most vulnerable category.

In this context the Integrated Child Development Services which is one of the largest and most unique out reach programmes for early childhood care and development, invites special attention. The programme provides a package of health and nutrition services to the vulnerable sections of the population in the poor socio-economic group. It also seeks to strengthen the capacity of the functionaries and communities through effective child care for managing mortality and morbidity. The anganwadi worker and the anganwadi helper are the two functionaries who are responsible for delivering the services at the anganwadi centre. The supplementary food is provided for about 50 beneficiaries including women and children through each anganwadi centre everyday. The job responsibilities of the anganwadi helper involves cooking, serving, cleaning, fetching water and cleanliness of small children. The anganwadi helper is also expected to develop skills in training the children to be hygienic in their personal and toilet habits. Work related to the preparation of simple recipes, conservation of nutrients through correct methods of cooking, storage and proper disposal of food wastes all come under the responsibilities of the anganwadi helper (Social Welfare Department, 1977). Hence a knowledge on food safety measures for the anganwadi helper is essential to ensure food safety and sanitation in the anganwadi centre.

According to the reports of NIPCCD (1996), it has been noted that training programmes designed for the anganwadi helpers were scanty and meagre. The data pertaining to their knowledge in the field of food safety are also at present scarce. Hence the present study entitled "Effect of training on food safety measures for the anganwadi helpers of ICDS" is proposed with the following objectives.

1. To study the socio-economic and personal profile of the respondents.

2. To study the infrastructure facilities of the anganwadi centres.

3. To assess the effect of training on the gain in knowledge, retention of knowledge, changes in attitude and extent of adoption.

4. To study the association of socio-economic and personal profile of the respondents on the impact of training.

Review of Literature

2. REVIEW OF LITERATURE

This chapter provides a proper orientation to the study on the effect of training on food safety measures to the anganwadi helpers of ICDS, by incorporating the available research findings. The review of previous works attempted in this study may assist in the delineation of new problem areas and may provide a basis for formulating a theoretical frame work for the study by empirical investigation. A review of related literature has been organised under the following heads.

2.1 Studies on food safety measures

2.2 Studies on ICDS

2.3 Effect of training

2.4 Socio-economic and personal characteristics

2.5 Association of socio-economic and personal characteristics with knowledge, attitude and practice

2.1 Studies on Food Safety Measures

Bhatia *et al.* (1980) studied various environmental factors and microbial agents influencing diarrhoea and found that diarrhoea was common in children below the age of two. Faulty feeding habits, storage of drinking water and lack of excreta disposal facilities were the significant variables responsible for the occurrence of diarrhoea.

Wodicka (1980) reported that the scientific committee for the food safety council has proposed a system of evaluating the safety of defined constituents of food. It is intended to apply to natural components of food, additives, contaminants, pesticides or even bacterial toxins.

According to Guerrin (1985) to protect the children from diarrhoeal infections, a task including health and nutrition education, hygienic preparation and storage of food ,more water and safer sanitation, improved personal and domestic hygiene and immunisation are to be taken.

A training programme on safe food practices for the field workers revealed that the gain in knowledge by the anganwadi workers was tremendous especially in the subject matter areas like methods of cooking, food adulterants, food additives, food poisoning and food toxins (Nandini,1988).

A review of food legislation was started in 1984 and led to the food safety Act 1990. This Act provides food authorities with new power to prevent the distribution of contaminated food and ensure that proper practices are being carried out by food businesses, and establishes a registration system for food businesses (Jacob1992).

Ferrinho *et al.* (1993) says that the basic elements in integrated community development can be regarded as educational. Success depends on a continuous learning process among health workers and members of general population.

A study conducted by Odugbemi *et al.* (1993) in a rural Nigerian community revealed that hygienic practices during handling and preparation

should be emphasized as adjuncts in intervention for control of diarrhoeal disease in developing countries.

Motarjemi *et al.* (1994) reported that contaminated food is responsible for much diarrhoeal disease in young children, yet the education of mothers and caregivers about the preparation of food under hygienic conditions tend to be neglected. Special attention should be given to advise on food safety for care givers notably mothers and educational programmes on this subject.

Developing countries should increase basic sanitation coverage and undertake educational programmes in this field (Joao *et al.* 1994).

Rajasree and Soman (1994) revealed that inspite of better food intake, the rural coastal children exhibited poorer nutritional status because of environmental deprivation.

Nicholls *et al.* (1994) reported that the major threat to human health from food is microbiological contamination in terms of death, sickness and economic loss.

In a study conducted by Tapia de Daza and Diaz (1994) the potential for contamination of fruits and vegetables is high because of the wide variety of conditions to which produce is exposed during growth, harvest, processing and distribution.

A study conducted by Desmarcheliar *et al.* (1994) in Malaysian households (119 Urban and 158 rural) revealed that kitchen hygiene was generally acceptable, although rated "poor" in some instance in the rural areas

Food prepared for lunch was usually sufficient for dinner also, the leftover items were stored at ambient temperature until required.

The household environment is that which carries the greatest risk of the health of the people living in developing countries particularly poor (National Conference on Environmental hygiene and promotional Initiatives, 1994).

Kaur and Selil (1995) reported that training brought about a significant gain in knowledge and improvement in the cooking practices among rural women . As women play a crucial role in the selection, preparation and serving of food, educating them will help in improving the nutritional status of the masses especially the vulnerable groups i.e., infants and pre-school children, pregnant and lactating women.

According to Hiroshi Nakajma (1995) policies are needed at school level to support and provide resources for programmes to supplement nutrition to rectify micro-nutrient deficiencies and ensure that appropriate safety practices are followed. A supportive environment could include provident places for the safe storage and consumption of food and ensuring that if food is available in the school, it is both nutritious and safe.

Brian (1996) says that every year more than five million human beings die from illness linked to unsafe drinking water, unclean domestic environment and improper excreta disposal.

Jamtu (1996) reported that the provision of information for the grassroots is a vital part of any programme intended to improve the community health. Those involved in this task play a major role in the

promotion of good health practices, relating to sanitation, drinking water, hygiene etc.

According to Ollinger-snyder and Mathews (1996) dietitians and dietetic technicians can use three approaches to reduce the incidence of food borne disease attributed to food handlers, conducting training and education programmes implementing a Hazard Analysis and Critical Control Points System (HACCP), and supporting certification of food service managers.

Childers and Walsh (1996) pointed out that pre harvest food safety is essential for the protection of our food supply. The production and transport of livestock and poultry play an integral part in the safety of these food products. The goals of the safety assurance include freedom from pathogenic, micro-organisms, disease and parasites, and from potentially harmful residues and physical hazards. Its functions should be based on Hazard Analysis and Critical Control Points from producer to slaughter plant with emphasis on prevention of identifiable hazards rather than on removal of contaminated products.

Singh (1996) reported that environmental sanitation in the home, community, school and place of work must be improved to prevent disease caused by droplet infection.

Merrill (1997) commented that the modern scientific and legal instruments available to the US Food and Drug Administration and allied agencies have improved regulation and advances in food preparation, preservation, and storage have contributed to a safer food supply.

Bovee *et al.* (1997) reported that HACCP is a tool used to assess hazards, estimate risks and establish specific control measures that emphasize prevention and control rather than reliance on end- product testing. Increasing public awareness of food safety has led producers and retailers of food to demand higher standards from their suppliers.

A food safety training programme would be beneficial for staff and consumers. Programs should be geared to staff and include ideas and learning levels by direct care staff in the homes (Walter *et al.*, 1997).

Setiabuhdi *et al.* (1997) revealed that sanitation and HACCP share the same goal of producing safe food products. The focus of sanitation is on the environment surrounding the food to prevent contamination hazards intrinsic to food materials. Together they provide the organizational base for applying the correct methods and procedures to ensure and verify that food served is safe for food service clients.

Moy *et al.* (1997) reported that WHO encourages the development of regulations that empower vendors to take responsibility for the preparation of safe food.

According to Ritu and Madhu (1998) ignorance coupled with illiteracy of the personal acts as a catalyst in the transmission of infectious organisms to the children. Hence there is an immediate need to resort to better and improved sanitary conditions besides cooking of clean food and also to its proper storage which is critical for the health and growth of toddlers.

Campbell *et al.* (1998) suggests that routine inspection (at least once per year) of food service premises is effective in reducing the risk of food borne illness; food handler training can improve the knowledge and practice of food handlers, and selected community based education programs can increase public knowledge of food safety.

Heathcock *et al.* (1998) highlights the need for improving the availability of information on food hygiene and infections acquired through food and water to HIV-Positive individuals.

Shelly and Madhu (1999) reported that the best way to ensure safety of water is by strict control and hygiene maintained at all the stages of its consumption.

Armstrong (1999) says that integrated hygiene and Food safety management systems in food production can give rise to exceptional improvements in food safety Performance but require high level commitment and full functional involvement. A new approach named hygieneconomics has been developed to assist management in their introduction of hygiene and food safety systems.

A course on food safety for nutritionists has been developed in Indonesia through collaboration between government, industry, academia and international agencies. By teaching the principles of the subject it equips the participants to recommended foods that are safe as well as nutritious (Crowther *et al.*, 1999).

According to Kaferstein and Abdussalam (1999) meeting the huge challenge of food safety in the 21st century will require the application of new methods to identify, monitor and assess food borne hazards. Both traditional and new technologies for assuring food safety should be improved and fully exploited. This needs to be done through legislative measures where suitable, but with much greater reliance on voluntary compliance and education of consumption and professional food handlers. This will be an important task for the primary health care system aiming at "health for all".

At the point of consumption food safety is improved by the provision of practical guidelines regarding the handling of meat and meat products (Attenborough and Mathew,2000).

2.2 Studies on ICDS

According to Chandraskaran *et al.* (1978) the aim of the training programme to the anganwadi was to impart training in subjects like general orientation about the programme, child development, non formal education, child health, and nutrition, functional literacy and lastly community contact and communication. The study was planned with a view to improve the quality of training and to fulfill the needs and requirements of the trainees.

PEO (1978 and 1982) and Krishnamurthy and Nadkarni (1983) pointed out that nutrition and health education component of the ICDS scheme was poorly implemented because of lack of suitable nutrition, health education material and due to lack of appropriate training for the functionaries.

Bhandari *et al.* (1981) reported that effective monitoring of severe

protein energy malnutrition in the ICDS areas had made a positive and significant impact on the mortality rate of children.

A report published by Programme Evaluation Organisation (PEO) (1982) threw light into the fact that supplementary nutrition was the most popular component out of all six services of ICDS,

In an evaluation done by PEO (1982) on ICDS, it was found that fifty seven per cent of the ICDS centres used local foods such as cereals, pulses and spices for supplementing where as twenty two percent used ready to eat foods.

Tandon *et al.* (1984) opinioned that co-ordinated approach for the delivery of health, nutrition and education services to mothers and infants through ICDS has helped in reducing the infant mortality rate in India.

Gupta *et al.* (1984) stated that ICDS was launched with the objective of improving the nutritional and health status of children below six years of age to proper psychological, physical and social development of the child which comprises a package of services such as supplementary nutrition, immunization, health checkups, referral services, health and nutrition education and non-formal education.

Chandra and Thayar (1985) rightly pointed out that a major obstacle in achieving the overall objective of the ICDS programme lies in the failure of providing supportive services like protected water supply, sanitation, education and community participation.

Mehendale *et al.* (1985) and Vivek *et al* (1989)had indicated that ICDS had a definite impact on health and nutritional status of children.

Anadan *et al.* (1985) had reported about the parasitic infestation among the child beneficiaries of ICDS in Tamil Nadu. The source of water, poor personal hygiene, poor environmental sanitation and open defecation were the reasons reported for the high prevalence of parasitic infestation.

Ghosh (1986) stated that the main objective of ICDS is to promote health of children from birth to six years and look after pregnant and lactating mothers and cater to the underserved segment of rural, tribal and urban population.

According to Bhan *et al.* (1986) reported that the ICDS, India's most comprehensive and ambitious programme is both preventive and development in design. It increases child survival. Besides it promotes maternal health and nutrition as child heath depends very much on maternal health.

Saxena and Bagchi (1986) are of the opinion that ICDS is a well conceived and well implemented programme and largest nutrition related child development programme in the country.

Widge *et al.* (1986) reported that the main attraction for enrolment in anganwadi centres was found to be the provision of supplementing food.

In a report published by ICDS (1987), it has been indicated that evaluation studies conducted on ICDS by planning commission, All India Institute of Medical services and National Institute of Public co-operation and child Development (NIPCCID), clearly depicted considerable decline in the prevalence of malnutrition in the ICDS areas.

According to Chaturvedi *et al.* (1987) lower prevalence of diarrhoea, dysentery and diseases of the skin and eyes were reported among the pre-school beneficiaries of ICDS in Uttar Pradesh.

Pawar (1988) rightly pointed out that the ICDS is based on the conviction that community development programmes can become catalytic agents for social change and serve to improve the quality of life of the present and future generations of the disadvantaged poor.

Sohoni (1988) commented that ICDS is the single most massive programme for child development in India and possibly of the world and it serves as a virtual conduct for child monitoring.

Bawaskar and Sathe (1989) has observed that nutritional status of children belonging to the urban ICDS block was better than that of rural ICDS block in Aurangabad.

Gupta and Srivastav (1989) observed a significant difference in the morbidity rate due to diarrhoea, eye diseases and skin infections among the ICDS and non-ICDS beneficiaries.

Narmada (1989) noticed in an urban ICDS project in Madras city that the environmental sanitation, living conditions and personal hygiene of the beneficiaries were very poor and drinking water supply was grossly inadequate.

Prinja *et al.* (1989) reported that continuous training should be imparted to anganwadi workers to enable them to manage common illness.

He felt that frequent job training should be rendered to the ICDS field level functionaries.

Srivasthava (1989) observed that eating behaviour of children attending the anganwadi centre was found to be improved significantly. He also expressed that lunch provided in the anganwadi centre supplemented the home diets of children.

Kothari and Natraj (1989) had opinioned that knowledge, attitude and practices of the mother beneficiaries in ICDS with respect to health aspects had improved considerably.

Syamakumari and Prema (1990) reported that a one week training on child development was conducted among anganwadi teachers of ICDS programme to improve their knowledge.

Thakar and Patil (1990) had opined that community participation is essential for effective implementation of ICDS programme.

Ukkuru (1993) had reported that nutritional status of the beneficiaries of the ICDS programme were relatively better than that of the non-beneficiaries due to the impact of the package of services provided to them.

Joshi (1996) pointed out that nutrition in ICDS is not a non-meal programme. In addition to the Supplementary Nutrition Programme, the noon-meal is also provided for the children attending pre-school classes in ICDS.

Kanji made of rice and green gram together with certain condiments is used for the noon-meal programme.

The reports of ICDS (1995) revealed to strengthen the capacity of caregivers and communities for child care and early stimulation, by building upon local language and child care practices to provide a nurturing physical and social environment for the young child in the family, community and at the anganwadi centres.

2.3 Effect of training

Gain in Knowledge

Non-formal nutrition education imparted to rural illiterate mothers improved their nutritional knowledge on food and nutrient intake of the family and young children (Chittamma, 1978).

Rajammal *et al.* (1982) reported that nutrition education imparted through the school curriculum and lunch programme had a significant higher beneficial effect than when imparted through the curriculum alone.

According to Syamakumari and Prema (1990) a training on child development revealed that the prescore was much below neutral score which pointed out their knowledge in child development was very poor inspite of

their job training or field experience. But post training results were highly satisfactory.

Singh (1995) reported that there was significant difference in gain in knowledge of the tribal women exposed to nutrition.

A training programme on first aid and home nursing to the field level agents of ICDS conducted by Prema and Rajani (1996) revealed that the participants gained enough knowledge and courage to vendor first aid measures when the occasions called for.

Razeena (2000) found that the actual impact of educational programme was the adoption of gained knowledge.

Retention of Knowledge

Selvaraj (1990) found that more than half of the information was found to be retained up to fifteen days.

At the retention stage, significant gain in knowledge was reported over a time interval of fifteen days (Singh, 1995).

Prema and Rajani (1996) revealed that majority of field level workers of ICDS were able to retain the knowledge they had gained through the training programme.

Changes in attitude

Russo *et al.* (1986) observed that as education increases, the awareness and attitude also increases.

A study conducted by Singh (1995) found that pretraining analysis of attitude of respondent showed that majority had neutral attitude. After 15 days of training, remarkable changes were observed with none having "strongly unfavourable" attitude towards nutrition practices.

Extent of adoption

Ramnath (1980) reported that there was significant variation in the adoption of child health care practices due to maternal education and family income.

A study conducted by Rajammal *et al.* (1982) revealed that desirable health practices as a result of exposure to the education programmes were adopted by rural women.

A study conducted by Johnson *et al.* (1998) to assess the food storage knowledge and practice of elderly people living at home conducted that food storage practices among the majority of elderly people interviewed do not meet recommended safety standards to minimize the risk of food poisoning.

Study conducted by Razeena (2000) found that teaching had significant effect on the adoption of practices.

2.4 Socio- economic and personal characteristics

Religion and Caste

According to Padmanabhan (1981) all the respondent labourers belonged to scheduled caste.

Shailaja (1990) in her study depicts that majority of the female labourers were from scheduled caste.

Sujatha (1990) reported that most of the agricultural labourers belonged to under privileged communities.

Age

According to Sharma and Singh (1970) women belonging to middle age group, participated in farm operations in large proportions than others.

Ingle and Dharmadhikarj (1987) reported that relatively higher proportion of female labourers were below 30 years of age (40 percent). The labourers below 40 years of age were 75.56 percent.

Shailaja (1990) observed that agricultural labourers have a mean age of 38 years.

Jayasree (1994) in her study found that for working in the unorganized sector there is no upper age or lower age limit for women.

Gaikwad and Gunjal (2000) in their study revealed that most of the respondents belonged to middle age category.

Family Size

According to Kumar (1982) the sample households of agricultural labourers were of small family.

A study conducted by Ingle and Dharmadhikarj (1987) revealed that 90 percent of the female labourers had family members up to five only our of which 40 per cent with one to three members and 50 percent with four to five family members.

Rajagopal (1993) reported that majority of the coir workers families in Andhra Pradesh had four to five members in their family.

Park (1997) found that the average family size in India is four.

Type of Family

Kumar (1982) reported that joint family system is not prevalent among agricultural labourers.

Nagammal (1989) and Suja (1989) reported that most of the families residing in the coastal areas of Thiruvananthapuram district were of nuclear type.

Sadasivan *et al.* (1980) and Suja (1989) reported that there was predominance of nuclear type of families among fishermen families of Tamilnadu and Thiruvananthapuram.

Shailaja (1990) reported that women agricultural labourers were having nuclear families.

Shah and Rathore (1993) found that little more than half of the women labourers of the unorganised sectors belonged to nuclear families.

Family Income

The female workers share of income in India was found to be below 50 per cent (UNICEF ,1990).

Inspite of low income, a high standard of living is enjoyed by keralites (Park,1997).

Educational Status of the respondent

Kanwar and Koranne (1989) says that 45.35 percent of working females were uneducated and 34.64 percent had only primary school education.

Shailaja (1990) reported that majority of the female agricultural labourers were able to read only.

Steek *et al.* (1991) found that there was good food consumption pattern with health promotion mirages among women with higher education.

According to Kude (1995) half of the beneficiaries of his study had high school education.

Mass Media exposure

Prema and Menon (1978) found that printed media and radio are the most popular media in the state.

Lalitha (1985) reported that there was no significant difference in knowledge level with high and low mass media participations.

Mony (1993) reported that poor response to the television programmes may be due to poor socioeconomic background of the respondents.

2.5 Association of socio-economic and personal characteristics with knowledge, attitude and practice

Significant correlation between knowledge gain and income in case of adopters was found by Somasundaram and Singh (1979).

Ramnath (1980) reported that income of the family and educational status of the mother has more influence on adoption of health care practices of child.

Chandrakandan (1982) found that young farmers could gain and retain more knowledge than middle aged and old farmers.

According to Bhatnagar and Singal (1984) younger women possessed more knowledge about health and nutrition.

Selvraj and knight (1985) pointed out that there was no significant influence on the gain in knowledge through mass media participation.

The size of family as well as type of family had least significant influence on the gain in knowledge where as it had most significant influence for the retention of knowledge regarding improved home practices (Malavia

and Verma, 1987). They also reported that there was no significant influence on the gain in knowledge through mass media participation.

Aneja *et al.* (1988) reported that age and education of respondents have significant influence on knowledge regarding health.

Kaur and Narwal (1988) reveals that age of mother, education, caste, family type, social participation, occupations knowledge and attitude towards immunization were found to be significantly associated with the adoption of immunization.

Santhoshkumar (1990) observed that there was an increasing response to education programmes as the age advanced upto 45 years.

Otta, (1992) reported that there was high awareness and adoption of better health measures due to higher maternal education.

Daral *et al.* (1995) found that low economic status, poor environmental hygiene coupled with lack of health education in mothers may contribute to a higher incidence of diarrhoea.

Materials and Methods

3. MATERIALS AND METHODS

The study entitled "Effect of training on food safety measures to the anganwadi helpers of ICDS" was conducted in order to assess the effectiveness of the training programme on food safety measures, on the knowledge gain, attitudinal changes and adoption of practices of the respondents (anganwadi helpers of ICDS). It was also aimed to find out the association of knowledge, attitude and practice (KAP) with the socio-economic and personal profile of the respondents and with the infrastructure facilities of the anganwadi centres. Techniques administered are presented under the following sub-heads.

3.1 Locale of research

3.2 Selection of respondents

3.3 Training on food safety measures

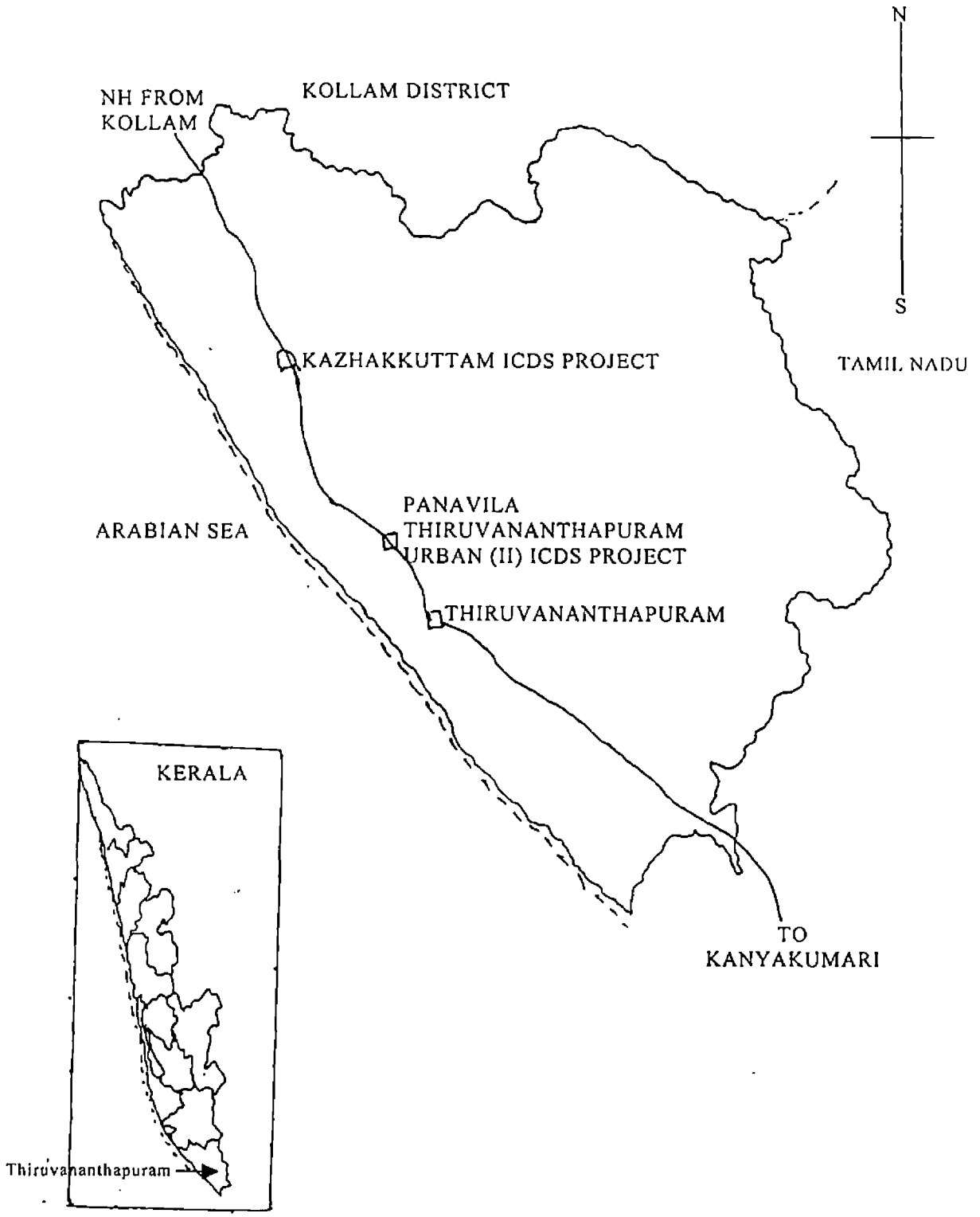
3.4 Impact of training

3.5 Statistical tools used

3.1 Locale of research

Since the present study is to assess the effect of training to the anganwadi helpers, two recently started ICDS projects namely Kazhakkuttam and Thiruvananthapuram Urban II were purposively selected (Fig. 1). There were 64 anganwadi centres in Kazhakkuttam and 51 anganwadi centres in Urban II ICDS projects. All the functioning anganwadi centres were selected for the study.

Fig. 1 Map of Thiruvananthapuram district showing the study area



3.2 Selection of respondents

Anganwadi helpers working on regular basis in the anganwadi centres of the two identified ICDS projects were selected as the respondents for the study. There were 46 anganwadi helpers in Thiruvananthapuram urban II ICDS and 54 anganwadi helpers in Kazhakkuttam ICDS projects thus forming 100 respondents for the study.

3.2.1 Socio-economic and personal profile of the respondents

Age: Age of the respondent was calculated as the number of completed years at the time of conducting the study.

Family size: The size of the family refers to the total number of individuals being the members of the family of each of the respondent.

Type of family:- Based on the composition of the family it was classified into joint or nuclear type.

Monthly income: The total monthly income of the families of the respondents were assessed ssand its mean was computed.

Educational status of respondent:- It is defined as the level of formal education attained by the respondents. To measure the educational status of the respondent, the level of education was coded into five classes i.e., illiterate, lower primary, upper primary, high school, and college level education and the scores given was zero to five respectively.

Trainings undergone

It is operationally defined as the number of trainings in food safety measures underwent by the respondent during the last five years.

Social participation

It is defined as the type (office bearer / member) of membership the respondent has in a social organization.

Mass media exposure

Mass media contact is defined as the extent to which an anganwadi helper is exposed to different mass media communications such as radio, newspaper, television etc.

The interview schedule used to collect the data regarding the socio-economic and personal profile of the respondents is furnished in Appendix I.

3.2.2 Techniques in data collection

Interviewing is considered as one of the reliable methods of collecting data (Rangaswamy, 1989). Besides, this technique also permits exchange of ideas and information (Sindhu, 1984).

Since observation method is a careful/systematic watching factor as they occur in the course nature, it is the most refined of modern research technique (Adiseshiab, 1989 and Sindhu, 1984). Data related to the anganwadi centres, with respect to cleanliness of the centres and the premises, eating and serving pattern, sharing of food supplement and the behaviour of the respondents were assessed. The questionnaire was prepared in English and was translated into Malayalam before administering to the respondents.

The questionnaires were pre tested in a non-sample area in similar conditions. Based on the pre testing certain modifications were made in the statements of the schedule to avoid ambiguous and irrelevant items.

The questionnaire and interview schedules duly revised are given in the Appendices I, III, IV and V.

3.3 Training on food safety measures

Rao (1975) defined training as a kind of learning process where a selected group of individuals undergo learning experience to internalise the skills, resulting in modifications of behaviour towards job performances.

Bhatnagar (1987) remarks that in training the focus is on learning by an individual the new ways of doing things i.e. better performance and secondly the transfer of learning in the work situation directed to greater organisational effectiveness.

According to Mariamma Tharakan (1996) training of the personnel implementing ICDS to improve the quality of service and capacity building is done periodically.

From the information collected through pre-test the lacunae in the KAP of the respondents was ascertained and the training programme on food safety measures based on their needs were formulated.

Through discussion with the officials of the two selected ICDS projects and the subject matter specialists, the training programme with reference to the syllabus, duration and time of conduct were finalised. The requirements of the respondents in the area of food safety measures were also discussed before finalizing the training programme. The training programme was conducted on three weekends in a month.

Plate 1 Conduct of training at Thiruvananthapuram Urban II ICDS project

Plate 2 Conduct of training at Kazhakkuttam ICDS project

2. Basic nutrition

3. Food storage and Pest control

These modules were comprised of lecture cum discussion classes with adequate support of suitable visual aids such as charts, posters, pictures and flash cards. Details pertaining to the training programme are presented in Appendix II.

The 100 respondents were trained in groups of 25 each. The training began with an introduction of the participant, building up a rapport and continued with the module presented in a day. Familiar communication strategies were applied during the training. Each module presentation was followed by discussion. Some participants were also called up on to repeat the presentation.

3.4 Impact of training

The effect of training on food safety measures to the respondents, was determined by deciding its effect on (1) gain in knowledge (2) changes in attitude and (3) extent of adoption of practices by the respondents.

Literature reviewed and discussions with experts including the officials of the ICDS of the social welfare department, indicated that socio economic and personal profile of the respondents and the infra structure facilities in the anganwadi centres are expected to have relationship with the three dependent variables mentioned above.

Gain in knowledge

Knowledge, as a body of understood information is possessed by an individual or by a culture which is in accordance with the established fact. It

is also one of the important components of behaviour and hence it would play a vital role in performing the job.

Knowledge of an individual can be measured using a teacher made test (Shankariah and Singh, 1967) or by the method of self appraisal (Singh *et al.*1968).

Knowledge level can be measured by using a score method in which knowledge score can be found to be

$$\frac{\text{Number of correct answers}}{\text{Raw score}} \times 100 \text{ (Jaiswal and Dave, 1972)}$$

$$\text{Knowledge quotient} = \frac{\text{Observed Knowledge}}{\text{Actual total score}} \times 100 \text{ (Singh and Prasad, 1974)}$$

For the present study in order to measure gain in knowledge, a simple teacher made objective type test was constructed following the procedure adopted by Santhoshkumar (1990) with slight modifications. Care was taken to ensure that the questions covered the entire range of subject matter selected for the study.

A total number of 40 statements on various aspects of food safety measures with special reference to the anganwadi centres were prepared and it was pre tested with a group of anganwadi helpers in a non-study area in order to avoid ambiguities as well as to edit some of the relevant questions. After this process and discussion with experts thirty questions were finally selected based on the modules selected namely "Sanitation and Hygiene";

"Basic nutrition" and "Food storage and Pest control". The check list formulated is presented in Appendix III.

The responses were collected in a dichotomous pattern i.e., Yes or No. Each correct response was given a score of one and the incorrect response was given a score of zero. The total score of each respondent were obtained by summing up the correct responses. The possible score of this test ranged from a minimum of zero to a maximum of thirty.

The knowledge test was administered to the respondents

(1) Before the training (Pre test- K_0)

(2) Immediately after the training (Post test-K_1)

(3) One month after the training (Post test-K_2)

The difference in the knowledge score of the respondents between pre test and post test indicated a measure of gain in knowledge. The test for gain in knowledge was conducted immediately after the training.

Percentage gain in knowledge was computed using the formula

$$\text{Percentage gain in Knowledge} = \frac{K_1 - K_0}{K_0} \times 100$$

where

K_0 - Pre test knowledge score

K_1 - Post test knowledge score (immediately after the training)

The gain in knowledge for each respondent was obtained and the mean score was arrived at for the respondents based on which further analysis has been done.

Retention of knowledge is the amount of knowledge retained by an individual on a particular topic after a reasonable period of time after the training. This is conducted one month after the training.

Retention of knowledge was computed using the formulae.

$$\frac{K_2-K_0}{K_0} \times 100$$

where

K_0 = Pre test score

K_2 = Post test knowledge score (One month after the training)

Change in attitude

Thurston (1946) defined attitude as the degree of positive or negative effect associated with some psychological object towards which people can differ in varying degrees.

Results of research and experience of extension scientists and workers indicated that attitude that an individual holds towards an innovation exercises significant influence on his/her accepting or rejecting that innovation (Prema *et al.* 1990).

In developing an attitude scale, a large number of items each expressing some opinion about the psychological aspects under the study were collected. These items were prepared according to the criteria suggested by Edwards (1957). After discussion with experts, 32 statements were selected. Care was taken to see that the statements were worded to express positive and negative attitudes and to select equal number of positive and negative statements in the scale. The check list was initially pre tested in a non-study

area. Item analysis is the basis for selection of items in Likert scale. Item analysis was done on the pre tested items and 18 statements were selected. These statements finally were pre tested and post tested in the study area.

Responses for each item were obtained in a five point scale ranging from "strongly agree" to "strongly disagree". The scores assigned were "strongly agree-4", "Agree-3", "Undecided.2", "Disagree-1" "strongly disagree- 0". Negative statements were scored in the reverse manner. The attitude score of the respondents were obtained by adding up the score corresponding to their response pattern for each statement. The attitude scale developed is presented in Appendix IV.

Change in attitude was computed using the formula

$$\frac{A_1 - A_0}{A_0} \times 100$$

where

A_0 = Pre test score

A_1 = Post test score

Extent of adoption

Rogers and Shoemaker (1971) defined adoption as a decision to make full use of new ideas as the best course of action available. Jaiswal and Dave (1972) developed an adoption quotient with the components such as the extent of adoption and potentiality of each practice.

In the present study the extent of adoption was measured as suggested by Wilkening (1952). For the measurement of the level of adoption of food safety measures, a check list with 30 statements was formulated through proper discussion with experts and literature reviewed. Based on the

checklist the researcher made a non-participant observation before the training and one month after the training. The checklist included equal number of positive and negative statements provided with two response categories namely "Yes" and "No" with score "one" and "zero". The maximum score obtained by each respondent was assessed by summing up the scores. The check list is presented in Appendix V.

The non-participant observation was administered.

(1) Before the training (Pre-test) P_0
(2) One month after the training (Post-test) P_1

The difference in the adoption level of respondents between pre test and post test indicated a measure of adoption of practice.

$$\text{Percentage adoption of practice} = \frac{P_1 - P_0}{P_0} \times 100$$

Where

P_0 - Pre test adoption score

P_1 - Post adoption score (One month after the training)

Infrastructure facilities of the anganwadi

A checklist was formulated regarding the infrastructure facilities of the selected anganwadi centres. It included the number of children and mothers attending the centre, the building, type of flooring roofing, storage facilities, safe water supply, toilet facilities, availability of utensils, play materials and study materials. It was done using an observation schedule, and were given score 'One' for each. It was summed up to get a total score which was the infrastructure index. The observation schedule is presented in Appendix VI.

3.5 Statistical tools used

The following statistical tools were used for the analysis of the data.

Mean

The arithmetic mean ($\bar{x}$) is the quotient that results when all items in the series is divided by the number of items.

Analysis of variance (ANOVA)

It was used for determining the variances of treatment in their effect on the dependent variables.

Simple correlations coefficients

It was computed to find out the relationship between the independent variables and each of the dependent variables.

Results

4. RESULTS

Keeping in view the objectives of the study, the results of the present study are presented under the following heads.

4.1 Distribution of respondents based on their socio-economic and personal characteristics.

4.2 Distribution of anganwadi centres based on the infrastructure facilities

4.3 Situation analysis on the implementation of NHE component of ICDS

4.4 Impact of training on the variations in knowledge, attitude and practice of the respondents.

4.5 Influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice

4.6 Influence of selected socio-economic situations and infrastructure of the anganwadi centres on changes in knowledge, attitude and practice of the respondents

4.7 Comparison of knowledge, attitude and practice scores of the rural and urban project based respondents

4.1 Distribution of respondents based on their socio-economic and personal characteristics

The distribution of the respondents based on their selected socio-economic and personal characteristics (independent variables) are furnished in Table 1.

Place of residence

With regard to rural/urban background, majority of the respondents (58 percent) hailed from rural area. Remaining 42 percent of the respondents hailed from urban area.

Religion

It is evident from Table 1 that majority of the respondents (87 percent) were Hindus. Eight percent were Christians and the remaining five percent were Muslims.

Caste

The caste wise distribution of the respondents depicted in Table 1 showed that majority of the respondents (65 percent) belonged to backward community and the remaining 35 percent belonged to forward caste.

Age

Results of Table 1 revealed that majority of the respondents (51 percent) belonged to the middle age group (35-55 years). Respondents of age group below mean were 47 percent and above mean were two percent.

Family size

With regard to family size, majority of the respondents (85 percent) had one to four members in the family. It was followed by fifteen percent having five to eight members. There were no respondents having more than eight members in the family.

Type of family

Table 1 shows that majority of the respondents (85percent) belonged to nuclear family where as fifteen percent belonged to joint family.

Table 1 Distribution of respondents based on socio-economic and personal characteristics

(n = 100)

Sl. No.	Characteristics	Category	Distribution of respondents in percentage
1.	Place of residence	Urban	42
		Rural	58
2.	Religion	Hindu	87
		Christian	8
		Muslim	5
3.	Caste	Backward	65
		Forward	35
4.	Age of the respondent	≤ 35	47
		35-55	51
		>55	2
5.	Family size	1-4	85
		5-8	15
6.	Type of family	Joint	15
		Nuclear	85
7.	Educational status of respondent	Illiterate	2
		Upper primary	35
		High school	63
8.	Monthly family income	≤ 565	18
		565-1941	71
		>1941	11
9.	Distance from residence to anganwadi centre	≤ 2km	47
		> 2 km	53
10.	Tenure of service	≤ 5	59
		5-10	12
		> 10	29
11.	Trainings undergone	No training	7
		Job training	93
12.	Social participation	No member	71
		Member	29
13.	Mass media exposure	Low	1
		Medium	65
		High	34

Educational status of respondent

It was observed that majority of the respondents (63 percent) had completed high school education, 35 percent had completed upper primary education and only two percent were illiterates.

Monthly family income

Regarding the monthly family income, it was observed that majority of the respondents (71 percent) had a medium monthly income ranging from Rs. 565-1941. Only eleven percent had high monthly family income >1941 rupees. Eighteen percent had the lowest income of less than or equal to 565.

Distance from residence to anganwadi centres

Results of the Table revealed that majority of the respondents (53 percent) stayed 2 kms away from the anganwadi centres. Only 47 percent stayed near to the anganwadi centres.

Tenure of service

With regard to tenure of service majority of the respondents (59 percent) had a service less than or equal to five years. Thirty two percent had a service between 5-10 years. Only nine percent had a service more than10 years.

Trainings undergone

As far as the trainings undergone by the anganwadi helpers is concerned, it is seen from Table 1 that a great majority of the respondents (93 percent) had undergone job training. The remaining seven percent had not undergone any training. None of them had undergone any refresher training.

Social participation

The distribution of the respondents based on their social participation revealed that only 29 percent were members of social organization. Majority of the respondents (71 percent) had no social participation in any organization.

Mass media exposure

The distribution of respondents according to their exposure to information source presented in Table 1, revealed that 65 percent of respondents had medium level exposure and 34 percent had high level exposure. Only one percent of the respondent had low level exposure.

4.2 Distribution of anganwadi centres based on the infrastructure facilities

Distribution of the anganwadi centres based on the availability of infrastructure facilities are furnished in Table 2.

Table 2 Distribution of anganwadi centres based on infrastructure facilities

(n = 100)

Sl. No.	Facilities	Category	Distribution of respondents in percentage
1.	Building facility	Owned	10
		Rented	90
2.	Rooms	Class room and indoor play area	100
		Class room and dining room	90
		Dining area alone	10
		Out door play area	18
3.	Type of flooring	Cemented	60
		Cowdung	23
		Mud	17
4.	Type of roofings	Thatched	40
		Sheet	23
		Concrete	12
		Tiles	25
5.	Bathroom/toilet facilities	Open area	50
		Temporary shed	10
		Sanitary toilet	40
6.	Safe water supply	Pipe	48
		Well	52
7.	Furniture	Mat, Table and Chair	57
		Bench, desk, Table and Chair	21
		Bench and desk alone	22
8.	Total furniture	Mat	57
		Bench and desk	43
		Table and Chair	78
9.	Vessels	Cooking, Serving and Storing	70
		Cooking and Serving	10
10.	Total vessels	Cooking	80
		Serving	80
		Storing	70

Table 2 Continued ...

Sl. No.	Facilities	Category	Distribution of respondents in percentage
11.	Storage facility for food	Sack	60
		Tin	35
		Vessels	70
		Shelves (open)	3
		Closed	4
12.	Total facility for storage	Sack, Vessels and tins	35
		Sack, Vessels	25
		Vessels	10
13.	Kitchen facility	Separate cooking area outside the building	70
		Small area for kitchen inside the building	16
		Classroom itself	4
14.	Cooking facilities	Wood and 3-stoned stove	86
		Kerosene and kerosene stove	4
		Saw dust and smokeless chulah	10
15.	Indoor play material	Stuffed toys	4
		Dolls and balls	42
		Clays and blocks	19
16.	Out door play material	Seasaw	5
		Swing	5
17.	Study materials	Charts, posters and books	32
		Charts, model and books	30
		Posters and chart	20
18.	Total study materials	Charts	82
		Poster	52
		Models	30
		Books	62

Building facilities

Results of Table 2 revealed that a great majority of the anganwadi centres were functioning in rented buildings (90 percent). Only ten percent anganwadi centres were functioning in own buildings.

With regard to availability of rooms, all the anganwadi centres had separate classrooms. These classrooms were also used as indoor play areas. 90 percent anganwadi centres used classrooms for dining purpose also. Only ten percent anganwadi centres had separate dining area. For this purpose verandah was used. Only eighteen percent anganwadi centres had out door play area.

Regarding the type of flooring 60 percent anganwadi centres had cemented flooring, 23 percent anganwadi centres had floors polished with cowdung and the remaining seventeen anganwadi centres had only mud flooring.

It was also noted that 40 percent anganwadi centres had thatched roofings, 23 percent used asbestos sheets, 12 percent anganwadi centres were having concrete buildings and 25 percent anganwadi centres had tiled roof.

Toilet facilities

Only 40 percent anganwadi centres had toilet facilities. Majority of the anganwadi centres (50 percent) used open area for toilet purpose. The remaining ten percent anganwadi centres had temporary shed without any sanitary facilities.

Safe water supply

Data epitomized in Table 2 indicated that majority of the anganwadi centres (52 percent) used well water for drinking purpose. The remaining 48 percent anganwadi centres used tap water for drinking purpose.

Availability of furniture

It was seen that majority of the anganwadi centres (57 percent) used mat for seating purpose of children. Forty three percent anganwadi centres had bench and desk for children. Seventy eight percent anganwadi centres had table and chair for anganwadi worker.

It was evident from Table 2 that 57 percent anganwadi centres had mat for children and table and chair for teacher, 21 percent had bench and desk for children and table and chair for teacher and the remaining 22 percent had only bench and desk.

Availability of vessels

Availability of vessels, as indicated in the Table 2 pointed out that majority of the anganwadi centres (70 percent) had vessels for cooking, storing and serving. The remaining thirty percent anganwadi centres had vessels for cooking and serving only. When observed individually it was also noted that 80 percent anganwadi centres had vessels for cooking, 70 percent had vessels for storing and 90 percent had vessels for storing.

Storage facilities for food

Results of Table 2 revealed that 70 percent anganwadi centres had enough vessels for storing. 60 percent anganwadi centres had sack, 35 percent had tins for storing. It was also found that there was only three percent anganwadi centres with open shelves and four with closed shelves.

It was also observed that 35 percent anganwadi centres had sack, vessels and tins for storage, 25 percent anganwadi centres had sack and vessels and ten had vessels alone for storing.

Cooking facilities

With regard to cooking facilities, 70 percent anganwadi centres had separate cooking area outside the building which was thatched. Sixteen percent anganwadi centres had facilities of a small area for kitchen separately with smokeless chulahs and 3-stoned stove also. The remaining four percent anganwadi centres used kerosene stove inside the classroom in a corner.

It was noted that the 70 percent anganwadi centres used 3-stoned stove and wood. Out of the sixteen percent anganwadi centres, ten percent used smokeless chulah and saw dust and the six percent used wood and the 3-stoned stove. Four percent used kerosene and kerosene stove.

Play and study materials

As indicated form the Table 2, availability of play materials was found to be low. In the case of indoor play materials 45 percent anganwadi centres had dolls and balls, nineteen percent of them had clay and blocks but only four

percent of them had stuffed toys. It could also be noted from the Table that only five percent anganwadi centres had swing and seasaw as out door play materials provided by the community.

Regarding the study materials, it was noted that 32 percent anganwadi centres had charts, posters and books. Thirty percent anganwadi centres had charts, model and books and 20 percent had posters and charts alone. 82 percent anganwadi centres had charts, 52 percent had posters, 30 percent had models and 62 percent had books.

The present infrastructure facilities of the anganwadi centres were assigned scores 1, 2 and 3. These scores were finally summed up to obtain an index. This was done in order to find out if the infrastructure facilities of the anganwadi centres had any association with knowledge, attitude and practice. The index ranged from a minimum score of 20 to a maximum score of 40. The results of the distribution of the anganwadi centres based on the index is presented in Table 3.

Table 3 Distribution of anganwadi centres based on infrastructure index

Sl. No.	Category	Distribution of anganwadi centres in percentage
1	Low (≤ 24)	16
2.	Moderate (24-33)	72
3.	High (≥ 33)	12

It is observed from the Table that majority of the anganwadi centres (72 percent) obtained an index between 24-33. Sixteen percent of the anganwadi

centres had low index for the infrastructure facilities while only 12 percent had high index.

Major job responsibilities of the anganwadi helpers

The major job responsibilities of anganwadi helpers involves cooking and serving of food to children and mothers, cleaning the anganwadi premises daily, fetching water for the anganwadi centre, cleanliness of small children and collection of small children from the village to the anganwadi centre. They are also supposed to develop skills in training children to be hygienic in their personal and toilet habits, assisting the anganwadi worker in health checkups, weighing of children and immunization of pregnant women and children, preparation of simple recipes, conservation of nutrients through correct methods of sanitation, storage and cooking, disposal of wastes and developing a small kitchen garden. In order to carry out the above activities in the anganwadi centre they are expected to have basic knowledge on the various aspects like environmental sanitation, personal hygiene and sanitation, basic nutrition, nutrients, their functions and deficiencies, different cooking methods to reduce nutritional loss, safe water supply, making best use of available resources in the anganwadi centre, storage method for different food item and its importance, simple methods of food preservation and prevention of pest and insect attacks.

Knowledge about these factors may decide the work ability of the respondent to execute the various job responsibilities entrusted to her. In the present study the existing knowledge, attitude and practice of the respondents

in the above aspects were assessed. From the information generated, lacunae in their knowledge were identified and a training programme of three days duration based on the above findings was planned and carried out. The knowledge gain was assessed immediately after the training and the retention of knowledge, attitudinal changes and adoption of practices were also assessed one month after the training.

4.3 Situation analysis on the implementation of NHE component of ICDS

Table 4 Distribution of respondents based on the knowledge towards food safety measures

Module	Total statements	Distribution of the respondents based on knowledge scores	
		Positive	Negative
Sanitation and Hygiene	11	68	32
Basic Nutrition	11	70	30
Food storage and Pest control	8	55	45

Table 4 reveals the distribution of respondents based on the pre-test knowledge score for different modules. The matter content of food safety measures was divided under three modules viz., 'Sanitation and Hygiene', 'Basic nutrition' and 'Food storage and Pest control'. Thirty statements in the three modules were included for testing the knowledge level of the respondents in the order of 11 under 'Sanitation and Hygiene', 11 under 'Basic nutrition' and eight under 'Food storage and Pest control'.

It was seen that only 68 percent respondents had positive knowledge about the statements included under 'Sanitation and Hygiene', while 70 percent respondents had positive knowledge towards 'Basic nutrition'. Compared to these two modules, their exposure to 'Food storage and Pests control' was found to be less, since only 55 percent had positively responded.

Table 5 Distribution of respondents based on their pre-attitude towards food safety measures

Module	Total statements	Distribution of respondents based on attitude scores				
		0	1	2	3	4
Sanitation and Hygiene	7	40	3	5	5	47
Basic Nutrition	7	36	3	20	4	37
Food storage and Pest control	4	41	5	18	3	33

Table 5 reveals the distribution of the respondents based on their pre-attitude scores towards food safety measures. There were seven statements under the module 'Sanitation and Hygiene'. Fifty two percent of the respondents were observed to have favourable attitude, while 43 percent respondents were unfavourable and five percent respondents were found to maintain a neutral attitude towards the module 'Sanitation and Hygiene'.

Seven statements were included under the module 'Basic nutrition'. Forty one percent of the respondents were found to have favourable attitude, 39 percent of the respondents were placed under unfavourable attitude group and 20 percent respondents were observed to be not sure of the statements under 'Basic nutrition'.

Four statements were included under the module 'Food storage and Pests control'. Forty six percent of the respondents were found to have an unfavourable attitude while 36 percent of the respondents were observed to have a favourable attitude and the remaining 18 respondents were noted to possess a neutral attitude.

Table 6 Distribution of respondents based on their pre-practice score towards food safety measures

Module	Total statements	Distribution of the respondents based on their pre-practice score	
		Positive	Negative
Sanitation and Hygiene	11	73	27
Basic Nutrition	11	44	56
Food storage and Pest control	8	40	60

Table 6 reveals the distribution of respondents based on their pre-practice scores. Out of 30 statements, 11 statements were related to 'Sanitation and Hygiene', 11 to 'Basic nutrition' and eight statements related to 'Food storage and Pests control'. It was observed that 73 percent respondents were found to have positive approach to better practices related to 'Sanitation and Hygienic' aspects in the anganwadi centres. Forty four percent respondents were found to have adopted practices related to 'Basic nutrition' and 40 percent respondents were observed to have adopted practices related to 'Food storage and Pests control'.

4.4 Impact of training on variation in knowledge, attitude and practices of the respondents

The scores of knowledge, attitude and practice were categorized into three based on the mean scores and standard deviation viz., low, moderate and high. It was assessed by calculating standard deviation (σ) and mean ($\bar{X}$). The score (x) is said to be low if x is less than $\bar{X} - \sigma$ ($x < \bar{X} - \sigma$), moderate if x is between $\bar{X} - \sigma$ to $\bar{X} + \sigma$ ($x = \bar{X} - \sigma$ to $\bar{X} + \sigma$) and high if x is greater than $\bar{X} + \sigma$ ($x > \bar{X} + \sigma$).

Distribution of the respondents based on knowledge scores

The data of the distribution based on knowledge scores are presented in Table 7.

A pre-post experimental design was used to study the impact of training on the knowledge gain of the respondents. Gain in knowledge was found out by working out the pre-training and post-training mean knowledge scores.

Table 7 Distribution of the respondents based on knowledge score

(n=100)

Sl. No.	Category	Distribution of respondents in percentage		
		K_0	K_1	K_2
1.	Low (<21)	22	10	10
2.	Moderate (21-26)	62	30	31
3.	High (>26)	16	60	59

The results of Table 7 revealed that majority of the respondents (62 percent) had moderate knowledge level for pre-test (K_0) prior to training. 22

percent of the respondents had low knowledge scores and 16 percent had high scores. The results of post-test (K_1) indicated that 30 percent had moderate scores, 60 percent had high scores and ten percent had low scores. The data epitomised in Table 7 also revealed that 59 percent had high scores, 31 percent had moderate and only ten percent had low scores for K_2 (Post-test one month after the training). Gain in knowledge due to training is illustrated in Fig. 2 where the mean scores for K0, K1 and K2 are depicted as 16.8, 24.34 and 23.8.

Distribution of the respondents based on the attitude scores

The results on the distribution of the respondents based on the level of attitude scores are furnished in Table 8.

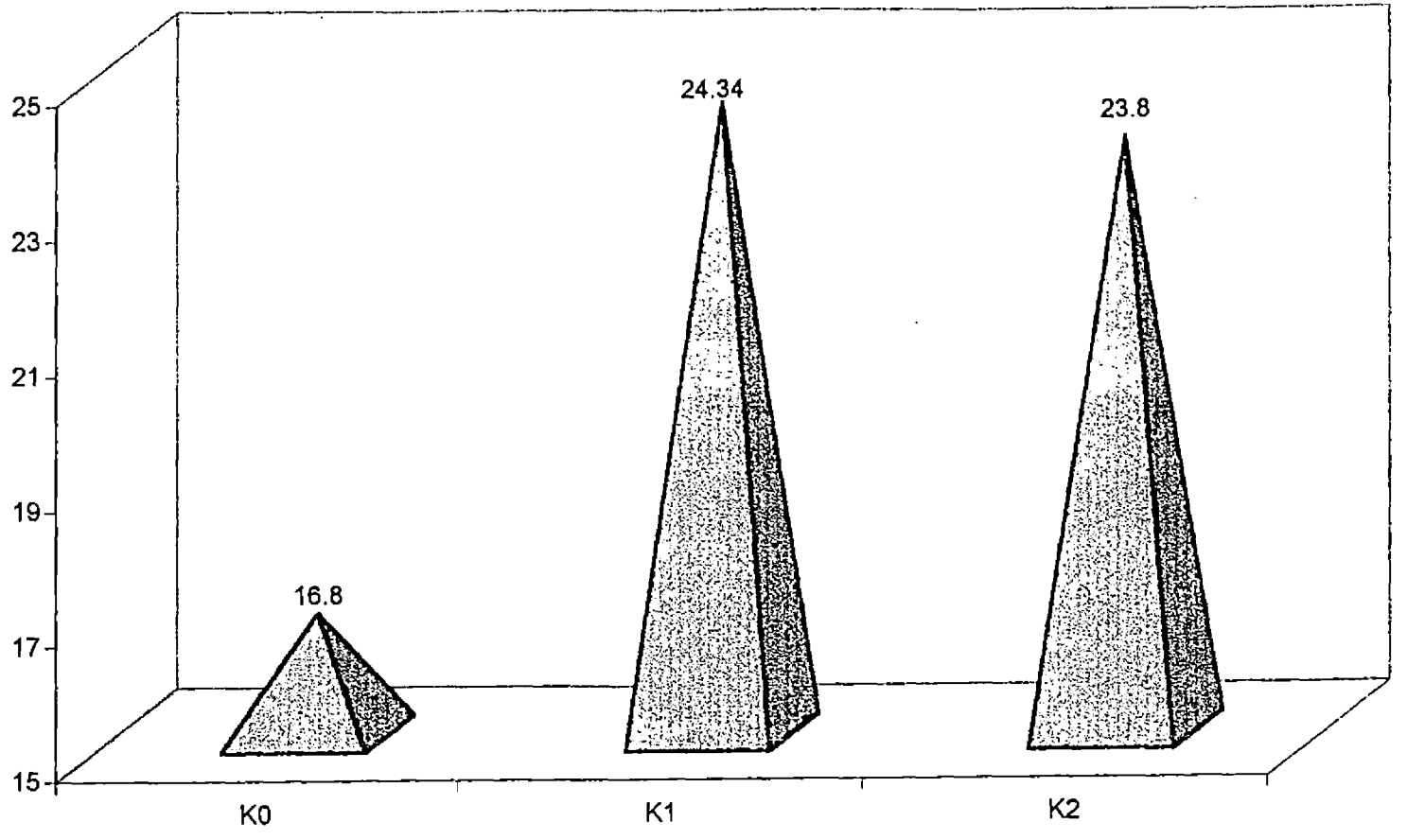
Table 8 Distribution of the respondents based on attitude scores

(n = 100)

Sl. No.	Category	Distribution of respondents in percentage	
		A_0	A_1
1.	Low (<41)	20	6
2.	Moderate (41-71)	61	30
3.	High (>71)	19	64

It is evident from the Table 8 that the many respondents (61 percent) had favourable attitude. Attitude score obtained by twenty percent of the respondents revealed less favourable attitude while 19 percent of the respondents had highly favourable attitude. Data collected after the training revealed that majority of the respondents (64 percent) had shifted to highly favourable attitude group, with a considerable reduction in the less favourable group (six percent). However 30 percent of the respondents were found to

Fig. 2 Impact of training on knowledge gain (mean scores)



K_0 Pre test knowledge score
K_1 Post test knowledge score (15 days after training)
K_2 Post test knowledge score (one month after training)

retain the same attitude level even after the training. Fig. 3 indicates the fluctuation of changes in attitude scores mean as 36.45 and 56.54 for A_0 and A_1 respectively.

Distribution of the respondents based on practice scores

The data on the distribution of the respondents based on the level of practice are epitomised in Table 9.

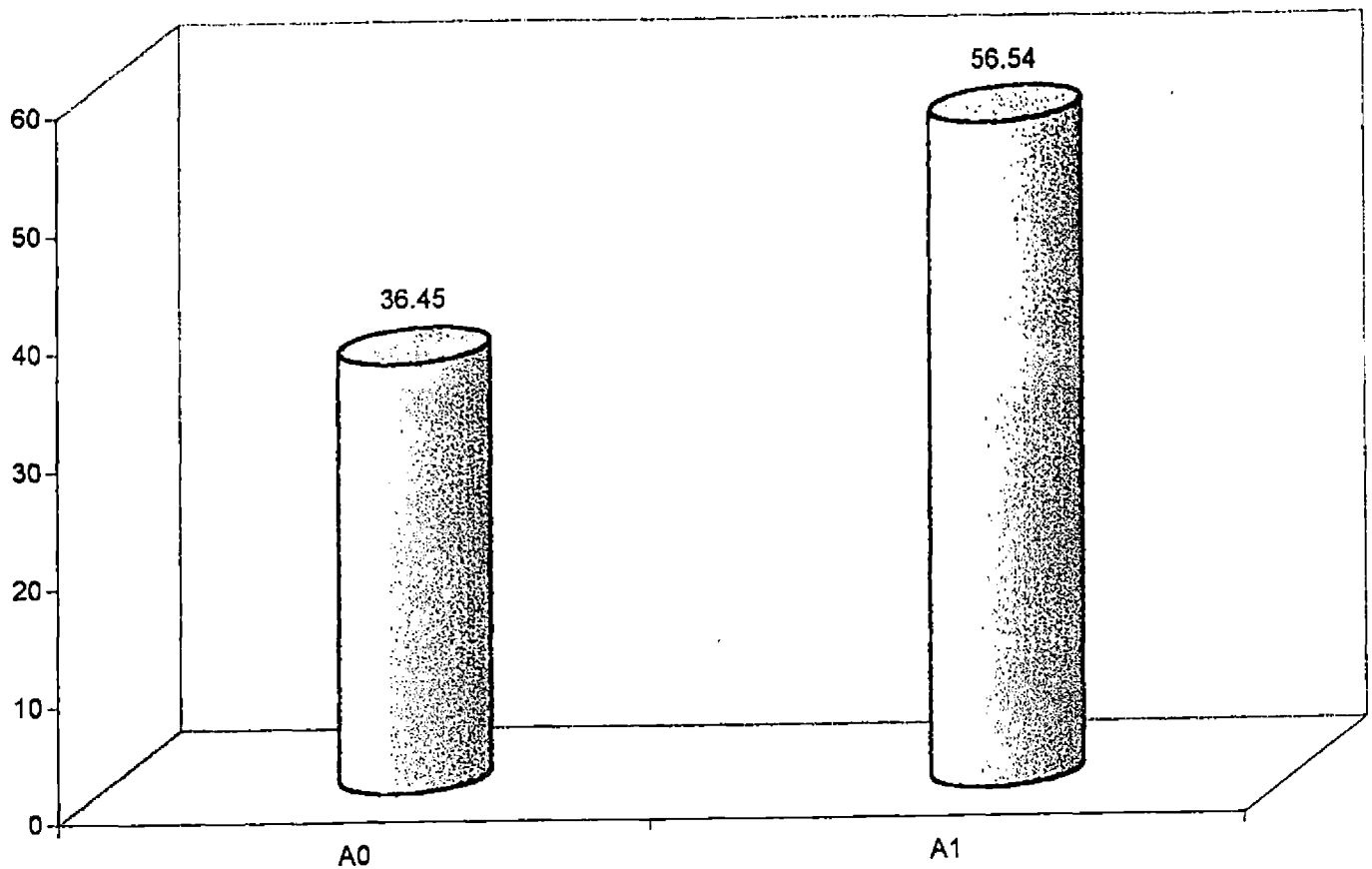
Table 9 Distribution of the respondents based on rate of adoption

(n = 100)

Sl. No.	Category	Distribution of respondents in percentage	
		P_0	P_1
1.	Low (<20)	17	2
2.	Moderate (20-25)	64	40
3.	High (>25)	19	58

It was found from the Table 9 that majority of the respondents (64 percent) had adopted the basic principles of food safety measures into practice. Only seventeen percent were found to have low scores and nineteen percent had high scores for the same. The impact of the training is reflected in the enhancement of the respondents (58 percent) who were found to have high scores and there was also shift of respondents from low practice level to moderate and high practice level. Fig. 4 illustrate this fluctuation as mean scores for P_0 (18.57) and P_1 (22.68).

Fig. 3 Impact of training on change in attitude (mean scores)



A_0 Pre test attitude score

A_1 Post test attitude score (one month after training)

4.5 Influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice

To test the influence of certain independent variables related to the socio-economic profile of anganwadi helper, viz., age, educational status of respondents, distance from residence to the anganwadi centre, tenure of service, social participation and mass media exposure on the means of percentage gain in knowledge, retention, attitude and practice, analysis of variance was done. The results are presented from Tables 10 to 15.

Age

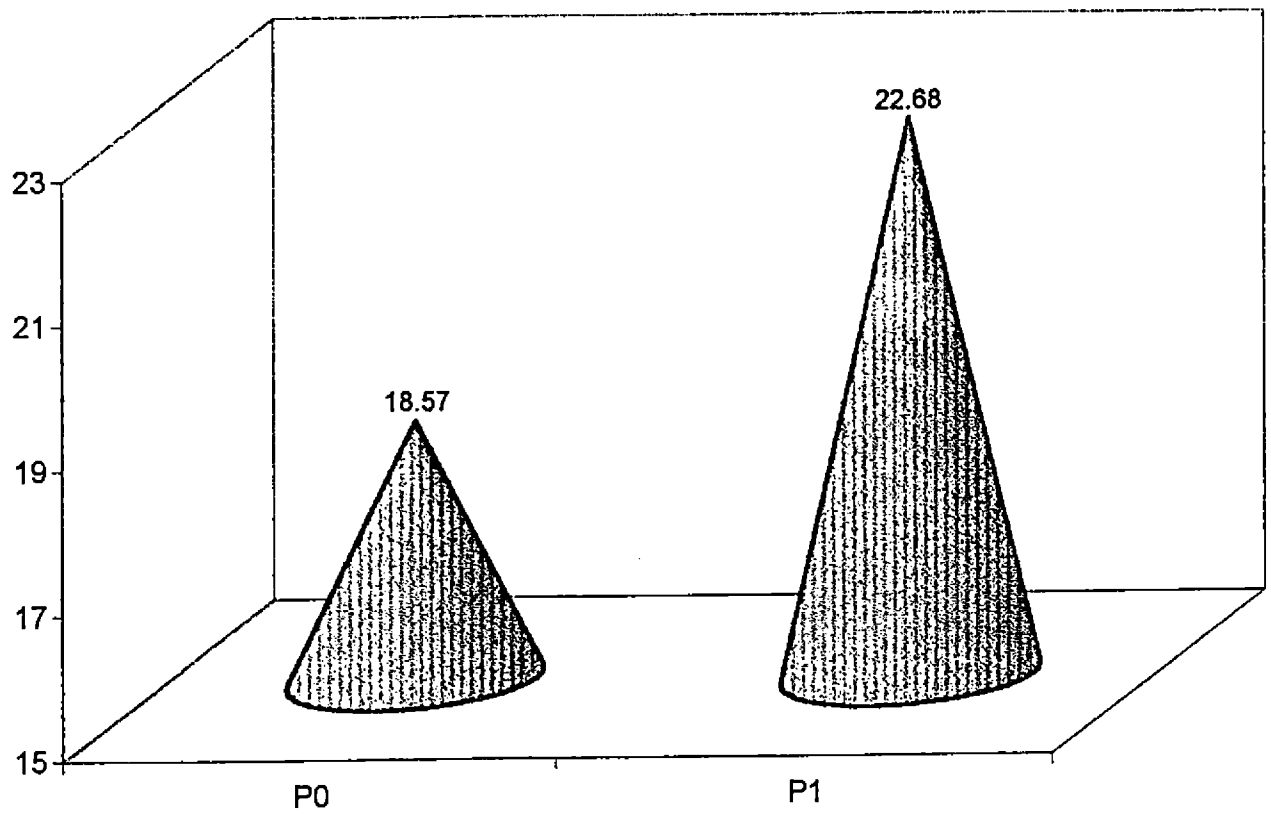
The respondents were divided into three groups, based on their age, as < 35 years, 35-55years and > 55years (Table 10). It was found that many respondents belonged to middle age group (51 percent). These respondents had a knowledge of 47.50 mean percent and 43.96 mean percent of the gained knowledge was also observed to be retained by them. This particular age group had an attitudinal change with mean percent of 62.37and a mean percentage of 28.79 adoption of practice were also observed among this group after the training.

Table 10 Influence of age on the knowledge, attitude and practice

(n=100)

Age	Percentage of respondent	Y_1	Y_2	Y_3	Y_4
≤ 35 years	47	47.39	44.38	77.73	28.79
35-55 years	57	47.50	43.96	62.37	22.20
> 55 years	2	45.56	45.55	37.50	12.37
F_2, 97	-	<1	<1	2.00	1.65
CD		-	-	-	-

Fig. 4 Impact of training on changes in practice (mean scores)



P_0 Pre test practice score

P_1 Post test practice score (one month after training)

4.5 Influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice

To test the influence of certain independent variables related to the socio-economic profile of anganwadi helper, viz., age, educational status of respondents, distance from residence to the anganwadi centre, tenure of service, social participation and mass media exposure on the means of percentage gain in knowledge, retention, attitude and practice, analysis of variance was done. The results are presented from Tables 10 to 15.

Age

The respondents were divided into three groups, based on their age, as < 35 years, 35-55years and > 55years (Table 10). It was found that many respondents belonged to middle age group (51 percent). These respondents had a knowledge of 47.50 mean percent and 43.96 mean percent of the gained knowledge was also observed to be retained by them. This particular age group had an attitudinal change with mean percent of 62.37and a mean percentage of 28.79 adoption of practice were also observed among this group after the training.

Table 10 Influence of age on the knowledge, attitude and practice

(n=100)

Age	Percentage of respondent	Y_1	Y_2	Y_3	Y_4
≤ 35 years	47	47.39	44.38	77.73	28.79
35-55 years	57	47.50	43.96	62.37	22.20
> 55 years	2	45.56	45.55	37.50	12.37
F_2, 97	-	<1	<1	2.00	1.65
CD		-	-	-	-

Forty seven percent of the respondents belonged to the younger age group of less than 35. They were also observed to have a mean percent knowledge gain of 47.39 as the former group. And they were found to have better retention since the mean percent of the retained knowledge was 44.38. Similarly the mean percent attitudinal changes (77.73) was better for this group while mean percent for adoption of practices (28.79) was similar to the former group.

Compared to these two groups the respondents in the higher age group (>55 years) were found to be poorer in all respects except in the retention of knowledge.

However, the variation in the knowledge gain, retention of knowledge, attitudinal change and rate of adoption were not statistically significant.

Educational status of the respondents

The respondents were grouped into five as illiterate, lower primary, upper primary, high school and college level. But none of the respondents were identified under the groups upper primary and college level.

Table 11 Influence of educational status of the respondents on the knowledge, attitude and practice

(n=100)

Educational status of respondents	Percentage of respondents	Y_1	Y_2	Y_3	Y_4
Illiterate	2	38.88	38.88	69.44	12.26
Primary	35	45.66	42.52	59.56	20.51
High school	63	48.64	45.28	74.38	28.06
F_2, 97		<1	<1	1.25	1.93
CD	-	-	-	-	-

The results of Table 11 revealed that majority of the respondents (63 percent) had high school education. They had a mean percent knowledge gain of 48.64 and retention was also found to be 45.28 mean percent of the gained knowledge. It was also observed that the respondents had favourable attitudinal changes (74.38 mean percent) and improvement in adoption of practices (28.06 mean percent).

But the respondents who had only primary school education were found to have 45.66 mean percent knowledge gain and 42.52 mean percent knowledge retention. Changes in attitude (59.56 mean percent) and adoption of practices (20.51 mean percent) were also found to be in a smaller extent. There were only two illiterates among the respondents. They had mean percent knowledge gain of 38.88 which was found to be fully retained. Change in attitude (69.44 mean percent) and improvement in adoption of practices (12.26 mean percent) were also observed.

When the data was treated statistically there was no significant positive association between the variables.

Distance from residence to the anganwadi centre

The respondents were grouped in to two based on their distance from residence to anganwadi centre viz., $\leq$ 2 kms and > 2 kms. The results are epitomized in Table 12.

Table 12 Influence of distance from residence to the anganwadi centre on the knowledge, attitude and practice

(n=100)

Distance from residence to centre	N	Y_1	Y_2	Y_3	Y_4
≤ 2km	47	43.45	40.24	71.34	26.51
> 2km	53	50.91	47.69	67.09	23.85
F_1, 98		3.04	2.88	<1	<1
CD		-	-	-	-

Results revealed that majority of the respondents (53 percent) stayed far away from the anganwadi centre. Knowledge gain (50.91 mean percent) and retention of the gained knowledge (47.69 mean percent) were better in this group but relative intensity in attitudinal change (67.09 mean percent) and rate of adoption of practices (23.85 mean percent) were observed to be less.

Forty seven percent of the respondents stayed near to the anganwadi centre. Their knowledge gain (43.45 mean percent) and retention of the gained knowledge (40.24 mean percent) was lower than the former group. When the attitudinal changes were compared it was observed that the respondents who stayed near to the anganwadi centre had more favourable changes in their attitude (71.34 mean percent) resulting in better adoption of practice (26.51 mean percent) than the other groups.

Tenure of service

The results furnished in Table 13 revealed that majority of the respondents had service less than or equal to five years. Gain in knowledge was 46.26 mean percent and retention of knowledge gain was 43.48 mean percent. Favourable changes in attitude (82.14 mean percent) and better adoption of 27.64 mean percent were also observed among these respondents.

Table 13 Influence of tenure of service on the knowledge, attitude and practice

(n=100)

Tenure of service	Percentage of respondents	Y_1	Y_2	Y_3	Y_4
≤ 5	59	46.26	43.48	82.14	27.64
5-10	12	58.76	54.27	47.61	26.76
>10	29	45.03	41.44	51.43	19.24
F_2, 97		1.96	1.51	6.95**	1.67
CD(1,2)		-	-	26.51	-
(3,1)				18.99	
(3,2)				28.74	

**Significant at one percent level

Twenty nine percent of the respondents had a tenure of service more than 10 years. However their rate of knowledge gain (45.03 mean percent) and retention (41.44 mean percent) were found to be less than the formal group. Same trend was observed in the findings related to attitude (51.43 mean percent) and adoption (19.24 mean percent).

The remaining 12 percent respondents had service in the range of 5-10 years. Gain in knowledge (58.76 mean percent) and retention (54.27 mean

percent) were better than the other two groups. However, similar results were not observed in changes in attitude (47.61 mean percent) and adoption (26.76 mean percent).

Statistical treatment of the data revealed a significant association between tenure of service and attitude (6.95**).

Social participation

Results presented in Table 14 revealed the influence of social participation of respondents on the knowledge, favourable attitude and inclination for better practices.

Table 14 Influence of social participation on the knowledge, attitude and practice

(n=100)

Social participation	Percentage of respondents	Y_1	Y_2	Y_3	Y_4
Not members	71	48.8	45.34	72.23	25.29
Member	29	44.27	41.36	61.41	24.65
$F_{1,98}$		<1	<1	1.21	<1
CD	-	-	-	-	-

Respondents (71 percent) who had no membership in any social organisation, were observed to obtain a knowledge gain of 48.8 mean percent and 45.34 mean percent of the knowledge gained was found to be retained by them. Their attitudinal changes (72.23 mean percent) and adoption of practices (25.29 mean percent) were also appreciable. While in the case of remaining 29 percent who had membership in social organizations, knowledge gain (44.27

mean percent) and retention (41.36 mean percent) was observed. Change in attitude (61.41 mean percent) and rate of adoption (24.65 mean percent) were comparatively less. However, the variation was not statistically significant.

Mass media exposure

Table 15 shows the results of influence of mass media exposure on the dependent variables. Rate of exposure was graded under three dimensions viz., low, medium, and high.

Table 15 Influence of mass media exposure on the knowledge, attitude and practice

(n=100)

Mass media exposure	Percentage of respondent	Y_1	Y_2	Y_3	Y_4
≤ 135(low)	1	35.29	35.29	75.86	33.33
135-180 (medium)	77	47.90	44.62	68.65	26.09
>180(high)	22	46.21	43.08	70.31	21.25
$F_{2, 97}$	-	<1	<1	<1	<1
CD	-	-	-	-	-

It was noted that majority of the respondents (77 percent) had medium level exposure. 47 percent improvement in knowledge gain was observed and 44 percent of the gain was found retained. It was also seen that there was a positive shift in the attitude (68 percent) and in the adoption of practices (26 percent).

Twenty two percent of the respondents had high level exposure. They had gain in knowledge of 46 percent and 43 percent of the knowledge gained was

retained 70 percent attitudinal change was observed and 21 percent practices were adopted.

Only one respondent had low exposure. She had a gain in knowledge of 35 percent and it was completely retained. The attitudinal change was high (75 percent) when compared to other two groups. The adoption percent was also high (33 percent) compared to the other two groups.

4.6 Influence of selected socio-economic situations and infrastructure of the anganwadi centres on changes in knowledge, attitude and practice of the respondents

Apart from the personal characteristics of the respondents, influence of certain socio-economic situations in which the respondent is placed viz., place of residence, religion, caste, family size, type of family, monthly income, tenure of service, training undergone and the infrastructure facilities of the anganwadi centre on the knowledge, attitude and practice were also assessed. The results of correlation are presented in Table 16.

With respect to knowledge scores, the pre test scores (K_0) were found to have a significant negative correlation with the socio-economic situations, viz., place of residence (-0.225) at one percent level while the post test knowledge scores (K_1 and K_2) were found to have significant negative correlation with place of residence (-0.2459 and –0.2569) and tenure of service (-0.2094 and –0.2226) at one percent level.

Similarly, place of residence (0.5066), family size (0.2462) and tenure of service (0.0569) were found to have significant association with the attitude scores at one percent level. There was also significant positive correlation of

Table 16 Influence of selected socio-economic situations and the infrastructure index of the anganwadi centres on changes in knowledge, attitude and practice of the respondents

Sl. No.	Independent variables	K_0	K_1	K_2	A_0	A_1	P_0	P_1
1.	Place of residence	-0.2250**	-0.2459**	-0.2569**	0.5066**	0.4670**	0.2436**	0.1426
2.	Religion	-0.1729	-0.0945	-0.1244	0.1421	0.1577	-0.1222	-0.0881
3.	Caste	0.1821	-0.0013	-0.0306	0.0602	0.0404	0.1557	0.0812
4.	Family size	-0.0574	0.0213	-0.0046	0.2462**	0.2437*	0.1491	0.0830
5.	Type of family	-0.0642	0.0420	0.0348	0.0161	-0.0601	0.0171	0.1421
6.	Monthly income	0.0810	0.0358	0.0283	0.0470	0.0531	-0.0798	0.1232
7.	Tenure of service	-0.1481	-0.2094**	-0.2226**	0.3790**	0.3014**	0.2200**	0.1436
8.	Training undergone	0.0090	0.0362	0.0089	0.0321	0.0514	-0.0011	-0.0544
9.	Index based on the infrastructure facilities of the anganwadi centres	-0.2067**	-0.1528	-0.1207	0.0595	0.0543	0.0678	0.0195

**significant at 1 percent level

Pre test practice scores (P_0) with place of residence (0.2436), and tenure of service (0.2200) at one percent level. There was no such association between post test practice score (P_1) and the independent variables studied.

The index developed based on the infrastructure facilities of each anganwadi centres was found to have significant negative association with the pre test knowledge score of the respondents at one percent level.

4.7 Comparison of knowledge, attitude and practice level of the rural and urban project based respondents

The KAP scores of the respondents, grouped according to variations in the location of the residence (rural and urban) were compared, administering analysis of variance (Anova test).

The results pertaining to the comparison of knowledge scores obtained for the two groups is presented in Table 17.

Table 17 Mean knowledge scores of urban and rural project based respondents at different observation

Area	Pre test (K_0)	Immediately after the training (K_1)	After 1 month (K_2)	Mean (R)
Urban	15.86	23.60	23.00	20.82
Rural	17.74	25.08	24.60	22.47
Mean	16.80	24.34	23.80	

F = Region (R) - 15.08; Time (T) = 685.54; RT = 0.41
SE = R = 0.301; T = 0.161, RT = 0.227
CD = R = 0.85; T = 0.45; RT = 0.63

Results revealed that there was significant variation in the knowledge gain immediately after the training and after one month, when compared to the pre-test knowledge score. But the knowledge when compared to mean knowledge score obtained by the two groups after one month was found to be less. Results also showed that the respondents working in rural based project area had acquired higher knowledge scores than their urban counterparts. The mean knowledge score for the three different observations was also observed to be higher for respondents working in rural based projects (22.4) than the urban based ones (20.82).

A comparison of attitude scores of the two groups of the respondents are presented in Table 18.

Table 18 Mean attitude scores of urban and rural project based respondents

Area	Pre test (A_0)	Post test (A_1)	Mean
Urban	45.54	65.10	55.32
Rural	27.36	47.98	37.67
Mean	36.45	56.54	

F = R = 54.53**; T – 1713.71**; RT = 1.19
SE = R = 1.69; T = 0.34; RT = 0.49
CD = R = 4.76; T = 0.97; RT = 1.37

The results of Anova revealed variation in the attitude level of the two groups of the respondents. The respondents of urban based project had a mean attitude score of 55.32 while the score for respondents of rural based projects was found to be 37.67 with significant variation.

A comparison of scores obtained for the adoption of practices of the two groups is presented in Table 19.

Table 19 Mean practice scores of urban and rural project based respondents

Area	Pre test (P_0)	Post test (P_1)	Mean
Urban	19.56	23.16	21.36
Rural	17.58	22.20	19.89
Mean	18.57	22.68	

F-R = 9.13**; T = 220.20**; RT = 3.39
SE=R = 0.34; T = 0.19; RT = 0.28
CD = R = 0.97; T = 0.55; RT = 0.78

As presented in Table 19 the rate of adoption of the respondents of urban anganwadi centres were found to be greater (Mean score – 21.36) than their counter parts in rural anganwadi centres. The effectiveness of the training on the rate of adoption was also found to be significant.

Discussion

5. DISCUSSION

The salient findings of the study presented in the previous chapter are discussed under the following heads.

5.1 Distribution of respondents based on their socio-economic and personal characteristics

5.2 Distribution of anganwadi centres based on the infrastructure facilities

5.3 Situation analysis on the implementation of NHE component of ICDS

5.4 Impact of training on the variations in knowledge, attitude and practice of the respondents

5.5 Influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice

5.6 Influence of selected socio-economic situations and infrastructure of the anganwadi centres on changes in knowledge, attitude and practice of the respondents

5.7 Comparison of knowledge, attitude and practice scores of the rural and urban project based respondents

5.1 Distribution of respondents based on their socio-economic and personal characteristics

According to Ghosh (1989), social factors like religion, occupation, economic status, education, belief and culture had important bearing on health. To assess the socio-economic status, details pertaining to the type of family, family size, monthly income and caste are reported to be ascertained (Srishi. 1985).

In the present study socio-economic variables such as place of residence, religion, age, family size, type of family, educational status of the respondents, distance from residence to anganwadi centres, tenure of service,

trainings undergone, social participation and mass media exposure were taken into consideration.

Vast majority of the respondents were Hindus, residing in rural area and in these places, helpers of anganwadi centres were selected form the local population and this intervention programme is offered for the under privileged sectors of the community and the anganwadi helpers were also observed to be representatives of this community population.

These observations are in conformity with the findings of Sharma and Singh (1970), Padmanabhan (1981) and Suja (1989).

As family size is an important social factor, distribution of families according to family size was done. The present study revealed that majority of the respondents belonged to small sized families (1-4 members). The results of this study is in tune with the findings of Kumar (1982), Ingle and Dharmadhikarj (1987), Rajagopal (1993) and Park (2000).

Majority of the respondents belonged to nuclear type of families. In Kerala joint family system is not much prevalent nowadays. Lisa (1995) reported that growing urbanization, breaking down of joint family system and high female literacy as reasons for reduced family size. Predominance of nuclear type of families among families residing in Thiruvananthapuram has been reported by Sadasivan *et al.* (1980) and Suja (1989).

Among the respondents only 98 percent of the respondents were literates and education is not a criteria for the appointment of anganwadi helpers. This may be due to the high literacy level in Kerala and in this

context, another point to be noted is that better the education, greater would be the knowledge and adoption as observed by Ramnath (1980).

The standard of living of an individual is directly or indirectly influenced by economic status. Arora (1991) suggests that household income should be taken into consideration because it is the family income which really determines the family's status and the socio-economic strata of the society to which they belong.

Majority of the respondents were observed to stay far away from the place where the anganwadi centre is situated. According to ICDS guidelines, the anganwadi helpers as far as possible are expected to stay in a radius of two km surrounding the anganwadi centre. The observations are in contradiction to the ICDS regulations. This may be due to the fact that each ICDS projects covered a vast area. Majority of the respondents were observed to have a service less than or equal to five years. This was mainly because the projects were recently started. In the case of those respondents who had a service >10 years, they were working as helpers in other child care institution before joining ICDS. The trainings undergone by the respondents revealed that many anganwadi helpers had undergone only job training. Newly recruited respondents were lacking this training. However as indicated in a report of NIPCCD (1996) training of ICDS functionaries is a key element and it should be geared towards improving their capabilities to play the role of service providers. Social participation of the respondents were also found to be poor, since only minority of the respondents were having membership in social organization.

But the mass media participation of the respondents revealed that majority had sufficient exposure to media. Mass media play a significant role in the spread of new ideas among women and in Kerala, majority of the families subscribe to newspapers and possess radio and television in their homes. These findings are in concurrence with the findings of Prema and Menon (1978), Lalitha (1985) and Mony (1993) conducted in similar studies.

5.2 Distribution of anganwadi centres based on the infrastructure facilities

Infrastructure facilities in an anganwadi centre in a way ensure the health profile of the children. Among the anganwadi centres surveyed, very few anganwadi centres had proper roof, flooring, toilets and drinking water facilities, which are the major factors guaranteeing proper health to the inhabitants.

Similarly, classroom accessories like mat, tables and chair were found in many anganwadi centres and 70 per cent of the anganwadi centres had enough vessels for cooking, storing and serving food.

Many of the anganwadi centres (42 per cent) were observed to have adequate indoor play facilities indicating that minimum facilities for cooking foods and keeping the children engaged during day time are available in all the centres.

Ukkuru (1993) in a study conducted among the beneficiaries of ICDS in Malappuram district reported that the infrastructure facilities of the anganwadi centres were not upto the satisfaction of the respondents.

According to Vandana Khullar (1998) more than 80 per cent anganwadi centres had no toilet facilities and only 21.2 per cent had satisfactory sewage

disposal drainage system. This facility is imperative for promoting health, toilet and hygiene habits from a young age.

Under ICDS programme there is no provision for providing own buildings for running the anganwadi centre and in most of the places it is the responsibility of the panchayat and the field functionaries to find suitable places for the centres as far as possible. Major job responsibilities of the anganwadi helper is to provide potable water supply and to maintain hygienic conditions within the anganwadi centre premises. By providing suitable training to the field functionaries, problem can be solved to a greater extent. But many a time the person who is holding this responsibility are found to be ignorant about these aspects.

5.3 Situation analysis on the implementation of NHE component of ICDS

The Integrated Child Development Services (ICDS) scheme in India is one of the largest national nutrition intervention programme that provides a package of nutrition and health services to the vulnerable sections of the population in the lower socio-economic groups. Nutrition and Health Education in the scheme is envisaged as the main plank to enhance the helper's capacity to shoulder their responsibilities.

The instructional materials available with the functionaries included a few booklets of nutrition and health. These served mainly the purpose of information source for the functionaries but did not meet the requirements for providing needed information on nutrition and health to primarily illiterate community with need specific and clear messages. The anganwadi helper may also need a manual with detailed instructions as to how to do things

which was not available. Thus the need for developing prototype Nutrition and Health Education material was clearly evident. NHE component of the ICDS scheme was reported to be poorly implemented in this aspect, because of lack of appropriate training for functionaries. NHE activities should be built up meaningfully with explicit messages. In many reports the type and content of NHE offered in the ICDS centres were irrelevant.

Knowledge outcome on food safety measures

Thirty messages that aimed primarily at a knowledge outcome on food safety measures were grouped under three modules viz., "Sanitation and hygiene", "Basic nutrition" and "Food storage and pest control". The knowledge and skills of the functionaries in selected areas of nutrition and health prior to training indicated that there were several topic areas in which they had very inadequate knowledge that needed to the strengthened. Out of the ten statements included under the "Sanitation and hygiene" all the anganwadi helpers were found to be well versed about the washing of hand, towels used, hands of children and cutting nails. More than 90 per cent of the anganwadi helpers were well aware of the ways of preventing worm infestation, significance of potable water and for keeping of children free of infection. They were familiar with the preventive measures to be taken against worm infestation, significance of keeping the premises of the well clean. Periodical addition of potassium permanganate in the well, basic steps to be considered in personal hygiene and disposal of waste were known to the respondents (51-75 percent) prior to training.

Under the module "Basic nutrition" 12 statements were included. Among these more than 90 percent of the respondents were conscious about the

hazards caused by anaemia, nutritional significance of vegetables and fruits and culinary practices to be observed while cooking green leafy vegetables. However, they were not vigilant about nutritional loss during cooking vegetables (77 percent) and steaming foods (70 percent). Importance of parboiled rice (22 percent) and breast feeding to a sick child (28 percent) were unknown to few respondents.

Eight statements were included in the module on "Food storage and pest control". Health problems caused by rodents, measures to prevent food spoilage were not known to many anganwadi helpers.

Attitude outcome on food safety measures

Eighteen statements that aimed at the attitudinal outcome on food safety measures among the respondents were included in the attitude scale administered. These statements were grouped under three modules viz. "Sanitation and Hygiene", "Basic Nutrition" and "Food Storage and Pest control". Seven statements were included under the module "Sanitation and Hygiene". A favourable attitude towards certain hygienic aspects such as washing of hands before food and importance of wearing clean clothes at the centre were observed among many respondents (66 percent). Similarly a positive approval towards environmental sanitation was indicated by 48 percent respondents since keeping the anganwadi premises clean and free from stagnant water, cleaning the bathroom and toilet regularly and daily disposal of waste away from the anganwadi centre were recognized as their job responsibilities.

Seven statements on "Basic Nutrition" were included in the scale administered to measure the attitude of the respondents. Among these 33-50 percent of the respondents showed an unfavourable attitude towards statements related to various nutrients and their sources and deficiencies. However about 55 percent of the respondents favourably reported to statements related to the culinary practices to be observed while cooking vegetables. It was observed that the respondents were ignorant about nutrient preservation and health hazards due to natural toxins present in commonly used foods (23 percent). Hence they maintained a neutral attitude to such a statements.

Four statements were included in the module on "Food storage and Pest control". Though many of the respondents were observed to have a favourable attitude to the statement related to sundrying of grains and pulses for pest control, most of them were unaware of the health problems caused by rodents and simple measures to prevent food spoilage and hence made a neutral attitude.

Adoption of practices on food safety measures

Thirty statements were included to study the existing practices adopted by the respondents on food safety measures at the anganwadi centre which was grouped under three modules.

Positive response to the fourteen statements related to "Sanitation and Hygiene" confirmed to the standard practices of the respondents, in their own clothing, keeping their nails clean as well as those of children and washing the hands of children prior to feeding (100 percent). Many respondents (95

percent) were found to be very conscious about the disposal of daily waste from the kitchen as well as from the premises. However the cleaning of the bathrooms and toilets day after day was observed to be habituated by 55 percent of the respondents. Eleven statements were related to 'Basic nutrition'. Fifty per cent of the respondents were found to refrain from imparting correct toilet training to the children during the school hours. Nine statements were included under the module "Basic Nutrition". Proper culinary practices were found to be adopted by few (23 percent) respondents in using dry fire wood for cooking so as to prevent smoke entering into the children's class rooms while regular cleaning and removal of ash from the stove after cooking were not found in the most of the anganwadi centres. Deworming, once in six month was found in the work schedule of 53 percent of the anganwadi centres.

Eight statements were related to 'Food storage and Pest control'. But measures to prevent breeding of mosquitoes in the anganwadi premises was found practiced only in seventeen per cent of the anganwadi centres. Fifty four per cent of the respondents were conscious about the significance of giving boiled and cooled water to the beneficiaries. But inspite of their awareness about the hazards of anaemia, iron and folic acid tablets were not regularly distributed to pregnant women in most of the anganwadi centres (40 per cent). Culinary practices related to cooking vegetables such as cutting vegetables into bigger pieces and washing them prior to cutting was practiced only by 40 per cent of the respondents. Moreover, excess water after cooking vegetables was thrown away by 68 per cent of the respondents. Significance of sprouting pulses was not known to many respondents and only seven per

cent of the respondents were found to be using sprouted pulses in the meal. Seven statements were included under the module "Food storage and Pest control". Majority of the respondents (60 percent) though aware of the importance of sundrying of grains and storing of them into air tight containers were not practicing it in the anganwadi centre. Only 37 percent of the respondents were found to adopt the practice of periodical sundrying of grains and 38 percent in storing them in air tight containers. Measures to prevent rodents were known to them but only 11 percent put the knowledge into practice.

A study conducted by Azanza *et al.* (2000) on food safety knowledge and practices found that knowledge on food safety concepts needs established particularly on topics that dealt with health and personal hygiene and food contamination. The study further revealed a significant gap between knowledge and practice on these topics by the respondents and recommended provision of continuous food safety education to diminish the gap between knowledge and practices.

5.4 Impact of training on the variations in knowledge, attitude and practice of the respondents

Gain in knowledge

The test was administered to the respondents before exposing them to the innovation and immediately after the exposure to measure their pre training and post training knowledge levels. The respondents were exposed to various aspects of food safety measures during the three days training. Preliminary information gathered revealed that majority of the respondents

(62 per cent) had moderate level of pretest knowledge score. A scrutiny of data of post test knowledge score (K_1) immediately after the training revealed that 60 per cent had higher scores with a shift from moderate to high and there was reduction in the number of respondents who remained in low score level (Table 7). The post test knowledge score (K_2), one month after the training indicated that 59 per cent had high scores and probably very few respondents were unable to retain the acquired knowledge.

The knowledge gain as well as the retention may be due to the training and also probably due to their constant exposure to mass media.

A study conducted by Siddaramaiah and Rajanna (1984) indicated that the gain in knowledge of the respondent was due to their exposure to various communication methods.

Evaluation of educational programme was conducted to popularize ORS as a preventive measure to reduce diarrhoea and the results of education indicated that there was increase in the knowledge of mothers with regard to the treatment and prevention of diarrhoea (Gincy, 1987).

Ukkuru (1993) studied the nutrition knowledge of mother beneficiaries and revealed that there was significant difference in the nutrition knowledge.

Santhoshkumar (1990) observed that there was an increasing response to education programmes as the age advanced up to 45 years. In this study majority of the respondents belonged to middle age group between 35-55 years.

Jay *et al.* (1999) reported that significant gaps were observed in the food safety knowledge of many respondents in a survey. The findings raise

(62 per cent) had moderate level of pretest knowledge score. A scrutiny of data of post test knowledge score (K_1) immediately after the training revealed that 60 per cent had higher scores with a shift from moderate to high and there was reduction in the number of respondents who remained in low score level (Table 7). The post test knowledge score (K_2), one month after the training indicated that 59 per cent had high scores and probably very few respondents were unable to retain the acquired knowledge.

The knowledge gain as well as the retention may be due to the training and also probably due to their constant exposure to mass media.

A study conducted by Siddaramaiah and Rajanna (1984) indicated that the gain in knowledge of the respondent was due to their exposure to various communication methods.

Evaluation of educational programme was conducted to popularize ORS as a preventive measure to reduce diarrhoea and the results of education indicated that there was increase in the knowledge of mothers with regard to the treatment and prevention of diarrhoea (Gincy, 1987).

Ukkuru (1993) studied the nutrition knowledge of mother beneficiaries and revealed that there was significant difference in the nutrition knowledge.

Santhoshkumar (1990) observed that there was an increasing response to education programmes as the age advanced up to 45 years. In this study majority of the respondents belonged to middle age group between 35-55 years.

Jay *et al.* (1999) reported that significant gaps were observed in the food safety knowledge of many respondents in a survey. The findings raise

important concerns about domestic food handling practices in Australian homes and the level of food safety knowledge in the community generally.

Impact of training on the knowledge and skill

The impact of training resulted in gain in knowledge and skills of the respondents. Thus demonstrating that it is important to train the trainers in the first instance it gave an opportunity to participate actively in finding a solution to the problems at the community level. Yet another positive feature of the training was orchestration of the NHE messages making it possible for the respondents to comprehend the messages in the same manner. Thus the possibility of contradiction in the message content, was avoided.

The training produced a significant improvement in the knowledge and skills of the helpers. They became competent in identifying the importance of inclusion of yellow and orange fruits and vegetables, sprouted pulses and also the dietary requirements of toddlers. All of them remembered clearly the adverse effects of unhygienic premises of the centre and well. Available evidence indicated that the NHE component of the ICDS scheme was poorly implemented primarily because of lack of suitable NHE materials and lack of adequate and appropriate training for the functionaries.

The trained respondents at the end of the training were much more conversant with the positive benefits of worm control, better cooking methods and recognition and prevention of infection to the preschool inmates. Their performance in the kitchen management of the anganwadi centre, after the training was very impressive.

The modular training developed for the study, which required only three days to implement equipped these grass root level functionaries with adequate subject matter and competence to provide Nutrition and Health Education to the community. The training also helped to improve their communicative competence. Interviewing a few respondents, further indicated that as situations described during training were similar to what they encountered in their villages or slum, the training was job specific enabling them to acquire necessary skill for doing NHE.

Visuals used during the training were also observed to sustain their interest and to comprehend the concepts. Thus it was evident that the functionaries needed training and assistance in both content and communication skills. The modules developed for this study addressed both these gaps.

Retention of knowledge

Biradar and Sundaraswamy (1998) reported that all education efforts aim at learning which can be recalled and transferred to new situations. The knowledge gained just after the exposure of media is no doubt important, but what is more important is the amount of knowledge retained after lapse of time.

In a similar study, Philip *et al.* (1999) observed the effectiveness of visuals in teaching; where the respondents of age group up to 35 years, with higher education, were found to have more knowledge gain, knowledge retention, skill acquisition and symbolic adoption.

Changes in attitude

The findings of the study were supported by the observations of Russo *et al.* (1986) and Singh (1995).

In the studies of Ukkuru (1993) it was revealed that there was much difference in the attitude of mothers in the aspects like hygiene, sanitation and deficiency diseases after training.

Extent of adoption

Many respondents had obtained better scores during post testing indicating that after undergoing the training, the respondents had adopted more practices of food safety measures.

Ukkuru (1993) indicated that the practices of mothers on hygiene, sanitation and general health practices improved significantly after the exposure to health education classes. She also reported that scientific practices related to infant feeding, health care and hygiene were found to be well inhibited by the beneficiaries. However, the training programme has not made profound impact on adopting the practices related to food habits. The findings are also in tune with the findings of Singh (1995). Similar studies of Neelma *et al.* (1998) reported a highly significant variation in adoption of child health care practices due to maternal education.

A study conducted by Johnson *et al.* (1998) revealed that food storage practices among the majority of elderly people interviewed do not meet recommended safety standard to minimise the risk of food poisoning.

5.5 Influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice

Anganwadi helpers are the field functionaries at the grass root level responsible for the implementation of ICDS programme. They spend most of their time in cooking, distribution of food and clearing up afterwards and hence spend less time in Health and Nutrition Education (HNE). Earlier studies conducted have revealed that variables like age, caste, educational level and distance from their residence to the anganwadi centres had a significant effect on the knowledge of participants but in the present study it was observed that though knowledge gain and retention level were found to be high among the older age group of respondents adoption practices was found to be comparatively much lower than the younger age group respondents. It may be due to the fact that as age advances people may find it difficult to change their long established practices even though they are aware of inappropriateness of their action. These observations are in line with the findings of Santhoshkumar (1990) and Philip *et al.* (1999).

Education level was observed to have an impact on the adoption of practices by the respondents. As education level of the respondents increased there was a positive inclination to adopt better practices.

Similarly, proximity to the work place has resulted in favourable attitude and better adoption of practices among the respondents who were residing nearer to the centre. The person who were residing in the premises of anganwadi centre will be more familiar with the area and this might have helped them to carry out the normal activities of the anganwadi centre in a better way with the gained knowledge and improved attitudinal changes.

A significant relationship between service and attitude towards their job was observed. Experiences due to the routine task might have been responsible for creating a favourable attitude which in turn might have helped to adopt better practices.

The heavy schedule of work at their work place as well as in their own domestic sector might have dissuaded many respondents to take active roles in any social organizations. And involvement in such activities were observed to divert their attention from the primary responsibilities.

5.6 Influence of selected socio-economic situations and infrastructure of the anganwadi centres on changes in knowledge, attitude and practice of the respondents

The pretest and post test scores of knowledge, attitude and practice and their association with selected socio-economic situations in which the respondents is placed are furnished in Tables 16.

Rural based respondents were found to have lower scores for knowledge gain during the pre and post-test. Probably in urban area, there is better chance of exposure to different media so as to improve their knowledge. However, knowledge gain has a positive association with the changes in their attitude and practice. As knowledge improves, a positive change in their attitude and subsequently in the adoption of better practices are to be anticipated.

Tenure of service was found to have negative correlation with the post-test knowledge scores but positive correlation with both the attitude and practice scores. Family size showed positive correlation with attitude. This might be due to the greater chance of exposure of the respondents.

It was observed that the infrastructure facilities of the anganwadi centres as such has no impact on the knowledge, attitude and practice of the respondents. It was also noted that the facilities were lacking in most of the anganwadi centres. However the result of the pre test reveal an association with their knowledge level and the index based on the infrastructure facilities of the anganwadi centres. But when the results of the post test were assessed, no such association was observed. This points to the fact that if proper awareness is given, even with the available facilities, better practices could be adopted. So it could be assumed that if better facilities were provided it will enable the functionaries in adopting better practices and thereby help in improving health status of the beneficiaries.

5.7 Comparison of knowledge, attitude and practice scores of the rural and urban project based respondents

Respondents of rural based ICDS projects were observed to be more enthusiastic during the training period and it was well reflected in their scores for knowledge gain while the urban respondents were found to have more favourable attitude towards the modules and showed better rate of adoption of practices.

These observations emphasise the fact that the ICDS functionaries who are responsible for educating the community, need to be trained periodically in relevant nutrition and health content and communication strategies.

The modular approach developed and tested in the present study has also yielded promising results indicating that the modules can be used for conduct of similar training programme for the field functionaries of ICDS programme.

Summary

6. SUMMARY

The Integrated Child Development Services (ICDS) scheme of Government of India started in 1975, is one of the largest national nutritional programmes that provides a package of nutrition and health services to the vulnerable sections of the population in the lower socio-economic group.

The study was conducted in Thiruvananthapuram district in two recently started ICDS projects viz., Kazhakkuttam and Thiruvananthapuram urban II.

Based on the pre test scores for knowledge, attitude and practice, the lacunae in the field of food safety measures were identified. Keeping this in view a need based training programme was planned and carried out.

For pre test and post test of knowledge and attitude suitably structured and pre tested questionnaire were used. To test the extent of adoption, a non participant observation with a check list was used. The data pertaining to the socio-economic and personal characteristics of the respondents were collected with the help of a structured pre tested interview schedule. The infra structure facilities of the anganwadi centres were also assessed using an observation schedule.

The socio economic and personal profile of the respondents indicated that majority of them hailed from rural area. Most of the respondents were from nuclear family. Moderate education, low monthly income, medium level mass media participation were other salient observations elicited about the respondents. The infrastructure facilities of the anganwadi centres were also found to be at a medium level.

The pre test scores revealed the lack of knowledge of the respondents about various aspects of 'Basic nutrition' and 'Food storage and Pest control'. A training programme of three days duration was conducted for the benefit of the respondents to impart required information on the above areas.

The training programme had significant effect on the gain in knowledge as well as in retention of knowledge. The training programme was also observed to have significant influence on the changes in attitude and extent of adoption.

Among the different socio-economic and personal variables only tenure of service was found to have significant influence on the attitudinal changes of the respondents.

Association of selected socio-economic situations of respondents on the knowledge, attitude and practice revealed that there was significant negative association of place of residence and tenure of service with knowledge. A significant positive association was observed with place of residence, family size and tenure of service and attitude. Significant positive association was found between pre practice scores and place of residence and tenure of service.

Association of infrastructure facilities of the anganwadi centres with knowledge, attitude and practice revealed that it had negative association with pre test knowledge.

Comparison of knowledge, attitude and practice of rural and urban project based respondents revealed that anganwadi helpers belonging to rural project had more knowledge level whereas anganwadi helpers belonging to urban project had more attitude and practice level.

References

REFERENCES

Adiseshiab, W.T.V. 1989. Tools for collecting data : Observation. *A Handbook of Methodology of Research.* Sri Ramakrishna Mission Vidyala Press, Coimbatore, p. 140

Anadan, S. and Subramania, S. 1985. Nutritional deficiency and parasitic infestation – A study in preschool children from anganwadi centre of Tamil Nadu. *Indian J. Nutr. Dietet.* **22** : 115-119

Aneja, A.S., Chikkara, S. and Kaur, P. 1988. Effect of age and education on knowledge of rural women regarding health. *J. Dair.. Fds Home Sci.* **17** : 141-144

Armstrong, G.D. 1999. Towards integrated hygiene and food safety management systems : the Hygieneomic approach. *Int. J. Fd. Microbiol.* **50** : 19-24

Arora, A. 1991. *The Women Elite in India.* Sangam Books Ltd., London, p.40

Attenborough, M. and Mathew, K.R. 2000. Food safety through the meat supply chain. *J. Appl. Microbiol.* **88** : 144-148

Azanza, M.P., Gatchalian, C.F. and Ortega, M.P. 2000. Food safety knowledge and practices of street food vendors in a Philippines university campus. *Int. J. Fd. Sci. Nutr.* **51** : 235-246

Bawaskar, B.S. and Sathe, P.V. 1989. A study of some aspects of integrated child development services scheme in projects Aurangabad (urban) and Motala (rural). Research on ICDS : An Overview.I : 429-430

Bhan, M.K., Ghosh, S. Arora, N.K. and Paul, V.K. 1986. *Successful Growth Monitoring-Some Lessons from India.* United Nations Integrated Child Emergency Fund, New Delhi, p. 15-30

Bhandari, B., Mandowara, S.L. and Chapparwal, R. 1981. Outcome of children with severe grades of protein energy malnutrition in an ICDS block. *Indian J. Paed.* **14** : 282-292

Bhatia, B.D., Agarwal, A.K., Singla, D.N. and Sanyal, S.C. 1980. Environmental factors and microbial flora in hospitalized children having diarrhoea. *Indian Paed.* **15**: 169

Bhatnagar, O.P. 1987. *Evaluation Methodology for Training.* Oxford and IBH Publishing Co. Pvt. Ltd., London, p. 1-95

Bhatnagar, S. and Singal, A. 1984. Attitude of women participants towards ICDS programme. *Indian J. Extn. Edn.* **20**: 10-11

Biradar, N. and Sundaraswamy, B. 1998. Influence of teaching methods singly and in combination on knowledge gain and retention by rural women. *Indian J. Extn. Edn.* **35** : 19-23

Bovee, E.H. de Kruijf, N., Jetten, J. and Barendsz, A.W. 1997. HACCP approach to ensure the safety and quality of food packaging. *Fd Addit. Contam.* **14** : 721-735

Brian, G. 1996. Water and Sanitation. *Regi. Health Forum* **1** : 21-22

Campbell, M.E, Gardner, C.E., Dwyer, J.J. Isaacs, S.M, Krueger, P.D. and Ying, J.Y. 1998. Effectiveness of public health interventions in food safety: a systematic review. *Can. J. Public Health* **89**: 197-202

Chandra, P. and Thayar, R.T. 1985. Nutritional assessment of ICDS project Madras IX (urban). *Proceedings of Annual conference of women Doctors Association of Tamil Nadu and Pondicherry*, 1985, p. 308

Chandrakandan, K. 1982. Effectiveness of farm broadcasts on listeners effective, cognitive and psychomotor behaviour. Ph.D. thesis, Tamil Nadu Agricultural University, Coimbatore, p. 153

Chandraskaran, K.N., Bhatnagar, S.R. and Banasal, S. 1978. Impact of ICDS training programme on anganwadi worker. *Indian J. Home Sci.*; 89-91

Chaturvedi, S., Srivastava, B.C. and Singh, J.V. 1987. Impact of total six years exposure to integrated child development services on growth and health status of target children in Dalmanu Project Area. (Uttar pradesh). *Indian J. Med. Res.* 6 : 766-774

Childers, A.B. and Walsh, B. 1996. Pre harvest food safety. *Ann. NY. Acad. Sci.* 79 : 314-317

Chittamma, R.K. 1978. An experimental nutrition education programme for rural women. Ph.D. thesis, Avinashalingam Deemed University, Coimbatore, p. 153

Crowther, J.S. Cox, L.J. Gross, R and Kaferstein, F.A. 1999. Food safety training for nutritionists. *Bull. Wld. Health Org.* 77: 172-175

Daral, T.S., Singh, H.P., Sachdev, H.P., Manmohan, M., Mathur, S.K. and Bhargava, S. 1995. Acute dehydrating diarrhoea. *Indian Paed.* 30 : : 333-337

Desmarcheliar, P.M., Apiwathnasorn, C., Vilainerum, D., Watson, C., Johari, M.R., Ahmad, Z. and Barnes, A. 1994. Evaluation of the safety of domestic food preparation in Malaysia. *Bull. Wld. Health Org.* **72** : 877-884

Edwards, A.L. 1957. *Techniques of Attitude Scale Construction*. Vakel, Feffer and Simons Ltd., Bombay, p. 1-40

Ferrinho, P., Robb, P., Cormelje, H. and Rex, G. 1993. Primary health care in support of community development. *Wld. Health Forum* 14 : 159-162

Gaikward, B.H. and Gunjal, S.S. 2000. Information seeking behaviour of Krishi Vigyan Kendra beneficiaries in Maharashtra. *J. Extn. Edn.* **20** : 2672-2676

Ghosh, S. 1986. Health for all by 2000- Myth or reality. *Indian J. Paed.* 34: 691-697

Ghosh, S. 1989. Health of the young women. Workshop on towards the preparation of adolescent girls for safe motherhood through ICDS programme. National Institute of Public Co-operation and Child Development, New Delhi, p. 84-90

Gincy, G. 1987. The importance of ORS in the control of diarrhoea in the coastal area of Thiruvananthapuram. M.Sc. (FS&N) thesis, Kerala Agricultural University, Trichur, p.180

Guerrin, N. 1985. Diarrhoeal diseases of children in the tropics. *St. Wld's Children* **158** : 65

Gupta, S.B. and Srivastava, B.C. 1989. Comparative study of morbidity and mortality of children under six years and utilization of health services in an ICDS and a non ICDS block in Uttar Pradesh. Research on ICDS: An over view.] : 345-346

Gupta, S.B., Srivastava, B.C., Vidyabhushan and Sharma, P. 1984. Impact of the integrated child development services in Uttar pradesh. *Indian J. Med. Res.* **79** : 363-392

Heathcock, R., Me Lauchlin, J., Newton, L.H., Soltanpoor, N., Coker, R., Bignardi, G. and Mc Evoy, M. 1998. Survey of food safety awareness among HIV positive individuals. *AIDS Care* **10** : 237-241

Healthy Home advisory Services. 1999. Your hands can kill. *New Woman* **20**: 141

Hiroshi, N. - 1995. Promoting Health Through Schools. World Health Organisation, Geneva, p. 35

Ingle, P.O. and Dharmadhikarj, N. 1987. Personal and socio-economic status of agricultural women labour. *Maharashtra J. Extn. Edn.* **6** : 27-32

ICDS. 1987. Department of women and child development.Ministry of Human Resource Development. Integrated Child Development Services, Government of India, p. 1-24

ICDS. 1995. Department of Women and child development Ministry of Human Resource Development. Integrated Child Development Services, Government of India, p. 1-24

Jacob, M. 1992. Food safety action to protect the consumer. *Geneva* 2:78-81

Jaiswal, N.K. and Dave, A.K. 1972. Effects of size of holding and irrigational facilities on adoption of high yielding varieties. *Indian J. Extn. Edn.* 8 : 8-12

Jamtu S., M. N. 1996. Health information for the grassroots, *Wld. Health Forum* 17 : 277-282

Jay, L.S., Comar, D. and Govenlock, L.D. 1999. A notional Australian Food safety telephone survey. *J. Fd Prot.* **62** : 921-928

Jayasree, S. 1994. Women in the unorganized sector- A study women coir workers in Kerala. Ph.D. (Sociology) thesis, University of Kerala, Thiruvananthapuram, p.150

Joao, Y., Chala, C. and Nora, B.L. 1994. Childrens health in the developing world: much remains to be done. *Wld Health Forum* 15 : 73-76

Johnson, A.E., Donkin, A. J., Morgan, K., Lilley, J.M., Neale, R.J., Page, R.M. and Silburn, R. 1998. Food safety knowledge and practice among elderly people living at home. *J. Epidemiol Community Health* **52** : 745-748

Joshi, M. 1996. Nutrition in ICDS. Food and Nutrition Board,Government of India, New Delhi, p. 25-27

Kaferstein, F. and Abdussalam, M. 1999. Food safety in the 21st century. *Bull. Wld Health Org.* 77 : 347-351

Kanwar, V.K. and Koranne, K.D. 1989. Position paper on hill farm women in central Himalayas. International conference on appropriate agricultural technologies for farm women. Future research strategy and linkage with development system. Abstracts, ICAR.New Delhi, p. 1-33

Kaur Y. and Selil S. 1995. Impact of nutrition education on knowledge and practices of rural women, *Indian J. Ext. Edn.* 31 : 80-83

Kaur, G. and Narwal, S. 1988. 'An immunization: A least adopted practices'. *Indian J. Public Health* **32** : 199-202

Kothari, G and Nataraj, K. 1989. Impact of ICDS intervention on child morbidity and health awareness in mothers. Research on ICDS: An Overview-I : 347-348

Krishnamurthy, K.G. and Nadkarni, M.V. 1983. Integrated Child Development Services- An assessment. United Nations Integrated Child Emergency Fund, New Delhi, p. 401-404

Kude, N.K. and Ingle, P.O. 1995. Evaluation of KVK programme. Agric. Extn. Rev. 5 : 3-8

Kumar, B. 1982. Profile of agricultural labourers in Mau Tahsil of Bunda district. G.B. Pant Social Science Institute, Allahabad, p.18

Lalitha, K.L. 1985. A study on the impact of training under WYTEP on knowledge and adoption level of farm women in Bangalore district of Karnataka state. M.Sc. (Ag) thesis, University of Agricultural Sciences, Bangalore, p. 168

Likert, R. 1932. A technique for the measurement of attitudes. *Arch. Psychol.* 140

Lisa, J.P. 1995. Dietary habits, fat consumption pattern and blood lipid profile of adults engaged in moderate activity. M.Sc (Home Science) thesis, Kerala Agricultural University, Trichur, p. 173

Malavia, A. and Verma, T. 1987. Strategical approach into Home Science practices through non-projected media. *Interactions* **5** : 56-61

Mariamma T. 1996. Nutrition programmes of the Department of women and child development. Food and Nutrition Board, Government of India, New Delhi, p. 24-26

Mehendale, S.M., Karandikar, V.N. and Nater, M.N. 1985. Some aspects of evaluation of Pune Urban ICDS project. *med. J. Western India* **13**:1-7

Merrill, R.A. 1997. Food safety regulation reforming the Delaney clause. *A. Rev. Public Health* **18** : 313-340

Mony, E. P. 1993. Food preference and dietary habits of adolescents among agricultural labourers. M.Sc. (Home Science) thesis. Kerala Agricultural University, Trichur, p. 152

Motarjemi, V., Kaferstein, F., Moy, G. and Queveolo, F. 1994. Contaminated food a hazard for the very young. *Wld Health Forum* **15**: 69-71

Moy, G., Hazard, A. and Kaferstein, F. 1997: Improving the safety of street vended food. *Wld Health Stat.Q.* **50** : 124-131

Nagammal, K. 1989. Impact of ragi based supplement on the nutritional status of selected pre-school children. M.Sc. (FS&N) thesis, Kerala Agricultural University, Trichur, p. 168

Nandini, P.V. 1988. Report on training on safe food practices, College of Rural Home Science, Kerala Agricultural University, Vellayani (unpublished), p. 1-30

Narmada, R. 1989. Incidence of worm infestation, anaemia, vitamin A deficiency and nutritional status of children attending some of the ICDS centres in Madras city. Research on ICDS: An Overview. I:163

National Conference on Environmental Hygiene and Promotional Initiatives. 1994. Community participation for environmental hygiene. A source Book on Environmental Hygiene Promotion, p. 17

NIPCCD. 1996. Department of women and Child development. Ministry Human Resource Development. National Institute of Public Co-operation and Child Development, Government of India, p. 1-48

Neelma, K[illegible], Dingar, S.M. and Ranjana, M[illegible] 1998. Impact of maternal education and family income on child health care practices. *J. Dair, Fds & Home Sci.* 17: 129-133

Nicholls, T.J, Mchean, G.D. Blackman, N.L. and Stephens, I.B. 1994. A food safety and residues in Australian agricultural produce. *Aust. Vet.J.* **71** : 393-396

Odugbemi, T., Oyerinde, J.P., Odujinrin, O.M., Akitoye, C.O.and Esumeh, F.I., 1993. Bacteriological study of cooked cereal weaning food and its potential safety in a rural Aligerian community. *Trans. R. Soc. Trop. Med. Hyg.* **87** : 234-235

Ollinger-Snyder, P. and Mathews, M.E. 1996. Food safety: review and implications for dietitions and dietetic technicians. *J. Am. Diet. Assoc.* **96** : 163-8, 171

Otta, B.M. 1992. Nutrition education for expectant mothers, *J. Family Welfare* **38** : 19-24

Padmanabhan, V.B. 1981. A study on the influence of labour efficiency on the adoption of improved agricultural practices by farmers and factors related with it. M.Sc. (Ag.) thesis, Kerala Agricultural University, Trichur, p. 153

Park, K. 1997. *Parks Text Book of Preventive and Social Medicine.* M/S Banarsidas Bhanot Publishers, Jabalpur, p. 1-58

Pawar, M.S. 1988. Women and family violence, politics and programmes *Social Change* **18** : 36

PEO. 1982. *Evaluation report of Integrated Child Development Services Project.* Planning Commission, Government of India, New Delhi, p.1-46

Philip, H., Annamalai, R. and Jayasubrahmanian, B. 1999. Effectiveness of video programmes among different age and educational groups. *J. Ext. Edn.* **2** : 2433-2435

Prema, L. and Menon, A. G.G. 1978. The credibility of various sources of information on human nutrition. *Agric. Res. J. Kerala* **16** : 217-222

Prema, L. and Rajani, M. 1996. Impact of first aid and home nursing training for field level change agents. *Kurushetra* (XIIV) : 6

Prema, L., Vimalakumari, N.K., Ukkuru, M., Geetha, P. And Xavier, N. 1990. *Attitude of rural women towards supplementary nutrition and other services of Integrated Child Development Services (ICDS) implemented in Kerala.* World Food Programme, p. 1-40

Prinja, B., Sunderlal, P.V. and Gaur, D.R. 1989. A study on morbidity pattern among preschool children. Research on ICDS: An over view: 173-174

Rajagopal, M. 1993. Fibre co-operatives for rural women: An analysis of organisational and management aspects. *J. Rural Dev.* **12** : 33-38

Rajammal, P.D., Sithalekshmi, S. and Padma Kumari, S. 1982. Nutrition education programme in Nicken- Palayam village. *Indian J. Nutr. Dietet.* **19**: 258-259

Rajasree, S. and Soman, I.J. 1994. Nutritional status of children in Kerala. *Indian Paed.* **31**:651-655

Ramnath, T. 1980. Impact of Socio economic variables on the gain retention and adoption of knowledge. *J. Farm welfare* **27** : 26-34

Rangaswamy, P. 1989. Tools for collecting data interview. *A Handbook of Methodology of Research.* Sri Ramakrishna mission Vidyalaya Press, Coimbatore, p. 140

Rao, M.K.S. 1975. Application of Hynton and Parcek model in farmers Training. *Indian J. Ext. Edn.* 11 : 76

Razeena, K.A. 2000. Impact of Educational Programmes on the Health and dietary practices of the workers of Sewage Farm in Thiruvananthapuram Corporation. M.Sc(Home Science) thesis, Kerala Agricultural University, Trichur, p. 173

Ritu G[illegible] and Madhu K[illegible] 1998. A microbiological study of the Hygiene maintained in Day Care centres of Chandigarh with special reference to contamination with E. Coli. *IndianJ. Nutr. Dietet.* **35** : 339-343

Rogers, E. M. and Shoemaker, F.F. 1971. Communication of innovation-cross cultural approach. The Free Press, New York, p. 56

Russo, E.L., Staelin, R., Nolen, C.A., Russel, G.J. and Metcalf, B.L. 1986. Nutrition information in the supermarket. *J. Consumer Res.* **13** : 48-70

Sadasivan, S., Kasthuri, R. and Subramanian, S. 1980. Nutritional survey in village of Tamil Nadu. *IndianJ. Nutr. Dietet.* 17: 243-245

Santhoshkumar, 1990. An experimental study on the relative effectiveness of selected visual aids in teaching neoliterates. M.Sc. (Ag.) thesis, Kerala Agricultural University, Trichur, p.168

Saxena, B.N. and Bagchi, 1986. Towards the implementation of a National Nutrition Policy in India. Indian Council for Medical Research, New Delhi, p. 1-40

Selvaraj, G. 1990. Effectiveness of video technique on farmers effective cognitive and psycho motor behaviour. [illegible] Ph.D. thesis, Tamil Nadu Agricultural University, Coimbatore, p. 136

Selvaraj, G. nd Knight, J. A. 1985. Role of sensory p:ceptors in dissemination of farm information. *Rural Dev:. Rev.* **4** : 410-415

Setiabuhdi, M., Theis, M. and Norbark, J. 1997. Integrating Hazard Analysis and Critical Control Point (HACCP) and sanitation for verifiable food safety. *J. Am .. Diet. Assoc.* **97** : 889-891

Shah, A. and Rathore, S. 1993. Women labourers in the unorganised sectors in the district of Jodhpur, Rajasthan. *J. Rural Dev.* **12** (4): 441-450

Shailaja, S. 1990. Role of women in mixed farming. Ph.D thesis, University of Agricultural Sciences, Bangalore, p. 41

Shankariah, C.H., and Singh, K.N. 1967. Predictive analysis of factors associated with knowledge of improved practices of vegetable cultivation. *Indian J. Ext:.. Edn.* **3**: 78

Shelly, K. and Madhu K. , 1999. Efficiency of Household water filters on Bacteriological Quality of Drinking Water in Chandigarh. *Indian J. Nutr. Dietet.* **36**: 484-490

Siddaramaiah, B.S. and Rajanna, B. 1984. Relative effectiveness of combinations of radio, slide show and film show – an experimental evidence. *Indian J. Ext:.. Edn.* **20**: 200-207

Sindhu, K.S. 1984. Methodology of research in Education. Sterling Publishers, New Delhi, p. 160

Singh, M. , 1995. Impact of nutrition training on tribal women of Bihar. A multidimensional study. M.Sc. thesis Avinashaligam Deemed University, Coimbatore, p. 147

Singh, B.P., Jaiswal, N.K. and Singh, B.N. 1968. Analysis of pre service Training Programme of Agriculture Extension Officers. *Indian J. Ext. . Edn.* 4 : 17-27

Singh, M. 1996. Strategies to improve the health of mother and child in India. Health and non health approaches. *Reg. Health Forum* 1 : 37-39

Singh, N.P. and Prasad, C. 1974. Communication behaviour of source credibility. Perception of young farmer. *Indian J. Ext.. Edn.* 10 : 53-58

Social Welfare. 1977. Job responsibilities of anganwadi helpers. Social Welfare Department, Government of India, p. 1-2

Sohoni, N.K. 1988. Future development perspectives on children: United Nations Integrated Child Emergency Fund, New Delhi, p. 40

Somasundaram, D. and Singh, S.N. 197 9. Communication gap between extension workers and paddy growing small farmers. *Indian J. Ext.. Edn.* 15 : 26-33

Srishi, S. 1985. Involvement of rural women in farming. *Indian J. Ext.. Edn.* 21 : 34

Srivastava, S. 1989. Learning by preschool children at noon meal in anganwadies sponsored by ICDS: Research on ICDS: An overview. 1 : 103 - 104

Steek, P., Dobson, A., Alexander, H.and Russell, A. 1991. Who eats what. A comparison of dietary patterns among men and women in differential occupational groups. *Aust. J. Public Health* 15 : 286-295

Suja, P.T. 1989. Effect of birth order and spacing on the nutritional status on the nutritional status of mother and child. M.Sc.(Home Science) thesis. Kerala Agricultural University, Trichur, p. 140

Sujatha, A.S. 1990. Food consumption and energy expenditure pattern of self employed women in unorganised sector. M.Sc. thesis, Kerala Agricultural University, Trichur, p. 130

Sumati, R.M. and Rajagopal, M.V. 1993. *Fundamentals of Food and Nutrition*. Wiley Eastern Limited, New Delhi, p. 1-237

Syamakumari, and Prema, L. 1990. Evaluation of a training on child development conducted for the benefit of the field functionaries of ICDS programme. *Proceedings of the second Kerala Science Congress*, February 1990, Thiruvananthapuram, p. 233-235

Thakar, V. and Patil, J.A. 1990. A study on the nutritional status of children in an ICDS centre of Nagpur city. *Indian J. Nutr. Dietet.* : 82-89

Tandon, B.N. 1984. Management of severely malnourished children by village workers in ICDS in India *J. Trop. Paed.* **30** : 76-78

Tapia de Daza, M.S and Diaz, R.V. 1994. Ecological and food safety considerations about products of vegetable origin. *Arch. Latinoam Nutri.* **44**: 232-241

Thomas, S.P. 1989. Effect of birth order and spacing on the nutritional status of mother and child. M.Sc. (FS & N) thesis, Kerala Agricultural University, Trichur, p. 128

Thurston, L.L. 1946. Comment. *Am. J. Social* **52** : 39-50

Ukkuru, M.P.1993. Nutritional status of ICDS (Integrated Child Development Services) beneficiaries with respect to participation. Ph.D. thesis. Kerala Agricultural University, Trichur, p. 162

UNICEF, 1990. Children and women in India-A situation analysis. United Nations Integrated Child Emergency Fund, New Delhi, p. 15-25

Vandana K. [illegible] 1998. Integrated Child Development Services. A Critique of Evaluation Techniques. *Econ. Poli. Weekly* **6** : 537-545

Vivek, A.S., Zaheer, M., Sinha, S. N. and Siddique, A. 1989. Impact on ICDS on the nutritional status of children. Research on ICDS: An overview,1: 302

Walter, A., Cohen, N.L. and Swicker, R.C. 1997. Food safety training needs exist for staff and consumers in a variety of community based homes for people with developmental disabilities. *J. Am [illegible] Dietet. Assoc.* **97** [illegible] : 619-625

Widge, M.K. and Aijaz, R. 1986. ICDS in four states. *Social Change.* **16**: 22-26

Wilkening, E.A. 1952. Informal Leaders and innovators in farm practice. *Rural Soci*[illegible]**17**: 272-275

Wodicka, V.O. 1980. Evaluating the safety of food constituents. *J. Environ. Path. Toxicol.* **3**: 139-147

Appendices

APPENDIX – I

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI
Department of Home Science

Name of investigator :
Name of Subject :

"Effect of training on food safety measures to the anganwadi helpers of ICDS"

Interview schedule to collect information regarding socio-economic and personal profile of the respondents

1. Name of respondent :
2. Husband/father's name :
3. Address :
4. Rural/Urban background :
5. Religion/caste :
6. Details of family members :

Sl. No.	Name	Age	Relationship with respondent	Educational status	Occupation	Income
1						
2						
3						
4						
5						
6						

7. Other job :
8. Income from that :
9. Total monthly income :
10. Distance from residence to centre :
11. Tenure of service :
12. Trainings undergone

	Number	Tenure	Year
Job training			
Refresher training			
Any other training			

13. Social participation :
    Name of organization :
    Position : Member
    No member

14. Mass media exposure

Sl. No.	Mass media	Daily	Twice or more in a week	Once in a week	Once in a fortnight	Once in a month
1.	Speech					
2.	Exhibition					
3.	Discussion					
4.	Radio					
5.	T.V.					
6.	Cinema					
7.	Newspaper					
8.	Research publication					
9.	Periodicals					
10.	Slide show					
11.	Training					
12.	Educational institution					
13.	Neighbour					
14.	Relatives					
15.	Friends					

APPENDIX II

THE TRAINING SCHEDULE FOR THREE DAYS PROGRAMME ON FOOD SAFETY MEASURES

Day	Time	Subject	Mode of conduct	Visual aids used
First day	1.00 pm-5.00 pm	**Sanitation and Hygiene** 1. Introduction on food safety measures 2. Environmental sanitation 3. Personal hygiene and sanitation with special reference to anganwadi centres 4. Food borne diseases and prevention	Lecture cum discussion	Posters and leaflets Flash cards and charts Pictures
Second day	1.00 pm-5.00 pm	**Basic nutrition** 1. Food and nutrition – Major nutrients, their function and deficiencies 2. Different cooking methods to reduce nutrient loss 3. Safe water supply 4. Making best use of available resources in the anganwadi centre	Lecture cum discussion	Leaflets Pictures Posters Charts
Third day	1.00 pm-5.00 pm	**Food storage and Pest control** 1. Storage methods for different food item and its importance 2. Simple methods of food preservation to prevent food spoilage 3. Pest and insect attack and its prevention	Lecture cum discussion	Leaflets and posters Charts Leaflets and pictures

APPENDIX – III

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI
Department of Home Science

Name of investigator :
Name of Subject :

"Effect of training on food safety measures to the anganwadi helpers of ICDS"

Statement to test the knowledge on food safety measures

Sl. No.	Statements	Yes	No
1.	The towels used in kitchen should be washed every day to prevent contamination		
2.	Outdoor slippers can be used in the kitchen		
3.	The dirty vessels can be washed near the wells		
4.	Potassium permanganate is used for purifying water		
5.	The hands of children should be washed properly before taking food		
6.	The dustbin in the anganwadi centre should be lightly closed		
7.	There is no need to put up the hair of the anganwadi helper during preparation and serving of food		
8.	The children's nails should be cut short and kept clean		
9.	B.H.C. is to be used in the anganwadi kitchen to kill ants		
10.	Worm infestation can be controlled through clean surroundings		
11.	A distance of 50 feet is needed between the well and latrine		
12.	The water from the well can be used for drinking without boiling		
13.	There is no loss of nutrients due to cooking of vegetables		
14.	Nutrient loss is high due to steaming of foods		
15.	Parboiled rice is better than raw rice		
16.	Yellow and orange fruits and vegetables are good for healthy eyes		
17.	Sprouted pulses are rich in vitamin 'C'		

18.	Breast milk can be given to infant when they are having diarrhoea		
19.	Anaemia occurs due to the deficiency of iron		
20.	Deworming should be done every six months in kids		
21.	Typhoid is transmitted through contaminated food and water		
22.	Fruits are poor source of proteins		
23.	Green leafy vegetables should not be washed before cooking.		
24.	Flour should be stored in air tight containers for a long period		
25.	Carbohydrate rich foods are essential to prevent paleness		
26.	Food materials get easily spoiled due to food preservation		
27.	Food materials stored in sacks should be sundried occasionally		
28.	The intake of water is restricted in diarrhoea.		
29.	Iodised salt should be used instead of ordinary salts while cooking foods		
30.	An injection of tetanus toxoid should be given to patients with cuts or wounds		

APPENDIX – IV

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI
Department of Home Science

Name of investigator :
Name of Subject :

"Effect of training on food safety measures to the anganwadi helpers of ICDS"

Statement to test the attitude on food safety measures

Sl. No.	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Scabies cannot be prevented by personal cleanliness					
2.	There is no harm in wearing wet clothes					
3.	Stagnant water should not be present in the anganwadi premises					
4.	The bathroom and latrines should be cleaned regularly and made free from pathogenic organisms					
5.	The waste should be dumped far away from the anganwadi premises					
6.	Do not encourage spitting on the road					
7.	Rat droppings are not dangerous than rat bite					
8.	It is not safe to use water filters					
9.	Drinking milk gives strong teeth					
10.	Rice should be washed 4-5 times before cooking					
11.	The goiterogens present in food causes goiter					
12.	Sprouted pulses are harmful to health					
13.	Ant eaten foods can be safely consumed by human beings					
14.	Cockroaches are not harmless					
15.	To prevent the loss of minerals, the vegetables should be cut into big pieces					
16.	Once used oil can be used to prepare other food items					
17.	The skin of potatoes should be pealed off before cooking					
18.	Malaria is spread through flies					

APPENDIX V

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI
Department of Home Science

Name of investigator :
Name of Subject :

"Effect of training on food safety measures to the anganwadi helpers of ICDS"

Statement to test the practice on food safety measures

Sl. No.	Statements	Yes	No
1.	Anganwadi helper wears clean cloths		
2.	The nails of children are cut shot and kept clean		
3.	The hands of children are washed properly before taking food		
4.	The children wear clean cloths daily		
5.	The hair of anganwadi helper is put up during cooking and serving		
6.	The sick child is isolated from other children		
7.	The premises of the anganwadi centre is swept daily		
8.	The kitchen wastes are removed daily		
9.	The toilets and bathrooms in the anganwadi centre are cleaned daily		
10.	The vessels used for cooking and serving are cleaned daily before and after food preparation		
11.	The anganwadi premises are not allowed for toilet purposes		
12.	Boiled and cooled water is used for drinking		
13.	The well water is purified using potassium permanganate		
14.	The vegetables are cut into small pieces to prevent nutrient loss		
15.	The stored grains and pulses are sundried occasionally		
16.	The remaining food is properly covered and stored		
17.	Rice is stored in air tight containers		
18.	All the children at the anganwadi centre are given 'Vitamin A' drops		
19.	Deworming is done in every six months in children		

APPENDIX – VI

KERALA AGRICULTURAL UNIVERSITY
COLLEGE OF AGRICULTURE, VELLAYANI
Department of Home Science

Name of investigator :
Name of Subject :

"Effect of training on food safety measures to the anganwadi helpers of ICDS"

Observation schedule to collect the information regarding the infrastructure facilities of the anganwadi centres

1. Name of the project :
2. Name of anganwadi /number :
3. Address :
4. Number of children :
5. Building : Owned/Rented
6. Availability of rooms, flooring and roofing

Rooms	Type of floor	Type of roof
Class room		
Kitchen		
Play area (indoor/outdoor)		
Sleeping room		
Dining room		

7. Storage facilities :
Food materials :
Sack
Vessels
Tins
Shelf (open /closed)

8. Furniture
Table
Bench
Cupboard
Shelf (opened/closed)

9. Bathroom/toilet facilities :
Open area
Temporary shed
Sanitary toilet

10. Safe water supply
Source :

Pipe
Well
Pond
River
Any other

11. Vessels	Yes	No	Number
Preparation			
Storage			
Sieving and stove			

12. Fuel for cooking
A) Fuel
Saw dust
Kerosene
Wood

B) Stove
3-stoned stove
Kerosene stove
Gas stove
Smokeless chulah

13. Play materials

Out door	Indoor
Swing	Doll, ball
Sesaw	Clay, block

14. Study material
Chart
Poster
Model
Specimen
Book

EFFECT OF TRAINING ON FOOD SAFETY MEASURES TO THE ANGANWADI HELPERS OF ICDS

BY

JAIMY SURESH

ABSTRACT OF THE THESIS
SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE DEGREE OF
MASTER OF SCIENCE IN HOME SCIENCE
(FOOD SCIENCE AND NUTRITION)
FACULTY OF AGRICULTURE
KERALA AGRICULTURAL UNIVERSITY

DEPARTMENT OF HOME SCIENCE
COLLEGE OF AGRICULTURE
VELLAYANI
THIRUVANANTHAPURAM

2001

ABSTRACT

A study entitled the "Effect of training on food safety measures to the anganwadi helpers of ICDS" was conducted to assess the effect of training on food safety measures on the knowledge, attitude and practices of the anganwadi helpers of ICDS.

The study was carried out in two recently started ICDS projects namely Kazhakkutam and Thiruvananthapuram Urban II. All the anganwadi helpers in the functioning anganwadi centres of the two identified ICDS projects formed the respondents for the study.

Based on the pretest score for knowledge, attitude and practice of the respondents their lacunae in the field of food safety measures were identified and a need based training was planned and carried out.

The results revealed that the training programme had significant effect on the knowledge, attitude and practices of the anganwadi helpers.

The analysis of variance used to test the influence of socio-economic and personal characteristics of the respondents on their knowledge, attitude and practice revealed that tenure of service had significant influence on changes in attitude.

The analysis of correlation coefficient of socio-economic situations of the respondents with knowledge, attitude and practice revealed that there was significant negative association with place of residence and tenure of service with their knowledge level. Significant positive association was observed

with place of residence, family size and tenure of service with attitudinal changes. The study also revealed significant positive association of pretest scores of practice with place of residence and tenure of service. It was also found that the infrastructure index of the anganwadi centres had significant association with pretest knowledge score but not with post score.

Comparison of knowledge, attitude and practice scores of rural and urban project based respondents indicated that the respondents of rural project had more knowledge level when compared to the respondents of urban project. It could be effectively elevated from the results that the respondents of urban project had more attitude and practice level compared to the respondents of rural project.