

AN ABSTRACT OF THE THESIS OF

Lucy N. Miring'u for the degree of Master of Science in Home Economics presented on June 3, 1991.

TITLE: In-Service Training Needs of Nutrition Field Workers and Community Nutrition Technicians in Kiambu District in Kenya

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The purpose of this study was to determine the in-service training needs in selected subject matter areas as perceived by community nutrition educators in Kiambu District in Kenya. The study also sought to determine if there were significant relationships between selected demographic characteristics and the respondents' perceptions regarding in-service training needs.

The sample consisted of 25 community nutrition educators (17 Nutrition Field Workers and 8 Community Nutrition Technicians) who were working in Kiambu District at the time of the study. A questionnaire was developed to collect data concerning the respondents' demographic characteristics and their perceptions of the importance of in-service training needs in 15 selected subject matter areas.

Frequency distributions, percentages, and mean scores were used for the descriptive analyses. Chi-square analysis was used to determine if there were any significant relationships between selected demographic characteristics and the respondents' perceptions regarding in-service training needs.

The respondents perceived the greatest in-service training needs in the major areas of family health and diet modification. The top 25% of topics with the highest mean scores representing topics perceived to be most important for in-service training were identified. There were significant relationships with 16 topics when using job title, experience on current job, work place, and age as the determining demographic characteristics.

The findings of the study were discussed and recommendations offered to improve future in-service training programs and hence the quality of the community nutrition education program as it is implemented in the communities in Kiambu District in Kenya.

In-Service Training Needs of Nutrition Field Workers
and Community Nutrition Technicians in
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by

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In-Service Training Needs of Nutrition Field Workers
and Community Nutrition Technicians in
Kiambu District in Kenya

CHAPTER 1

INTRODUCTION

The Republic of Kenya, with a land area of 582,647 square kilometers, is a developing country on the eastern coast of Africa, along the equator. It is the twenty-second largest country on the continent. The country is bordered by the Indian Ocean and Somalia to the east, Uganda to the west, and Tanzania to the south, while the northern border is shared by Ethiopia and Sudan. Kenya has one of the highest birth rates in the world (4.1%) and its population was 22.1 million people in 1987 (UNICEF, 1989). Kenya has an agriculturally based economy. About 85% of the population lives in the rural areas and depends on agriculture; the rest are engaged in industry or other forms of livelihood (Jansen, Horelli, & Quinn, 1987). Agriculture currently accounts for slightly over one-third of the Gross Domestic Product (GDP) which is more than twice the contribution to GDP of any other sector (Central Bureau of Statistics, 1984).

For administrative purposes, Kenya is divided into eight provinces: Central, Eastern, Western, Nyanza, North Eastern, Rift Valley, and Nairobi. The provinces are divided into 41 districts, which are subdivided into divisions, locations, and sub-locations.

During the colonial administration, health services in Kenya concentrated on the then prevailing major infectious diseases such as plague epidemics, sleeping sickness, smallpox and malaria. Since Kenya's attainment of independence from British rule in December of 1963, the health services have greatly expanded, improved, and changed to incorporate emphasis on the needs of the people (Bwibo, 1988). With the expansion of health services, there has been a shift in program emphasis from curative to preventive and promotive health programs of which nutrition education is a part (Bwibo, 1988).

The objectives of the nation's social policies have been to eradicate poverty, diseases, and ignorance (World Bank, 1975). Kenya recognized that for the country to develop economically, the people had to be healthy to work maximally. During the 1979-1983 plan period, alleviation of poverty was the central objective. It was recognized that poverty had many dimensions, including inadequate income and malnutrition.

Until recently, food and nutrition activities in Kenya were the responsibility of several organizations and agencies. Their efforts were not always sufficiently coordinated (Jansen et al., 1987). In 1981, the National Food Policy, as proposed in Sessional Paper No. 4 of 1981, was endorsed by the Members of Parliament, an indication of the government's intention to introduce a series of wide-ranging programs and policies concerning food

availability and accessibility. Section 3 of the paper outlined that:

The government's policies aimed at reducing inequalities in the distribution of income will have the effect of mitigating the nutritional problem. The nutritional effects of these policies will be reinforced by the expansion of specific nutrition intervention programs including pre-school feeding, maternal and child health and the Family Life Training Centers (Jansen et al., 1987, p. 554).

Priority was to be given to programs which improved the nutritional status of children. To achieve the policy objectives, several committees were proposed. They included the Nutrition Committee, which had the task of collecting and processing data on nutritional status, nutrition monitoring systems, nutrition improvement, and food fortification.

The need for better coordination has been emphasized repeatedly. During the Government plan period 1980-1984, Food and Nutrition activities were to be integrated into the overall policy to ensure better health of the population and to achieve increased economic status from good nutrition (Jansen et al., 1987). For the purpose of integrating food and nutrition into overall policy, a separate Food and Nutrition chapter was included in the Development Plan.

In the 1979-1983 Plan, the following objectives were mentioned: 1) the creation of income earning opportunities; 2) the improvement of expenditure patterns; 3) the provision of other basic needs, such as nutrition, health care, basic education, water and housing; and 4) institution building.

A significant proportion of the population,

particularly preschool age children, is malnourished as a consequence of inequalities in the distribution of purchasing power, seasonal localized food shortages, and lack of nutrition education (Jansen et al., 1987). The overall objectives of the government's nutrition policy have been to correct this situation. The government of Kenya, recognizing that increased food production alone cannot resolve this problem effectively, has aimed its policy at: 1) increasing the production and consumption of more nutritious foods; 2) improving the distribution of purchasing power; and 3) implementing specific market intervention programs as and when necessary. Priority has been given to data collection and analysis of information on nutritional status of the population as a basis for determining the programs which will eliminate nutritional deficiencies most effectively.

Intervention programs and measures have been undertaken to improve the nutritional status of low-income groups and those at risk. The national nutrition education program has been expanded by increasing the number of nutrition teachers and enlarging the Karen College of Nutrition (Jansen et al., 1987).

To make sure that the programs outlined in the Sessional Paper would be implemented, the government established the Food and Nutrition Planning Unit and an Inter-Ministerial coordinating committee within the Ministry of Economic Planning and Development to jointly coordinate

the activities of the various organizations and agencies involved in nutrition.

Training Program for Community Nutrition Educators

All community nutrition educators are trained at the Karen College of Nutrition. Initially the College trained nurses and midwives for nine months as part of an in-service training program in nutrition. Currently the College trains high school graduates for two years and awards them a certificate in nutrition on successful completion of the training program.

The training is geared towards preparing students in knowledge and skills which will enable them to work competently in the field as community nutrition educators. The philosophy of the training program is to have suitably qualified persons to supply the necessary nutrition education to the community on a continuous and regular basis (Karen College, n.d.).

Sometimes the Ministry of Health organizes refresher courses for the community nutrition educators. During such courses, the field workers receive new knowledge and technical skills related to nutrition education. The objective of such courses is to equip the staff with skills which enable them to work better with their target groups. This study sought to find out from the community nutrition educators what they perceived as areas which needed

in-service training to enable them to meet the changing needs of the communities they serve.

Statement of the Purpose

The purpose of this study was to determine perceived in-service training needs of community nutrition educators in selected subject matter areas for the delivery of community nutrition education in Kenya. The study sought to determine what the community nutrition educators considered to be most needed in in-service training to enable them to meet the needs of the rural families with whom they work to improve nutritional status. The information derived from the study was used to make recommendations for planning future in-service training programs for community nutrition educators.

The research questions for the study were:

1. What are the in-service training needs in selected subject matter areas as perceived by the community nutrition educators themselves?
2. What are the relationships between selected demographic characteristics and the community nutrition educators' perceptions regarding in-service training needs?

Assumptions

1. The community nutrition educators were in an appropriate position to determine in-service training needs in the selected subject matter areas related to their work.

2. Self-perceived in-service training needs can be measured.
3. The community nutrition educators were honest in rating the need for in-service training in each of the selected subject matter areas.
4. The Likert-type scale accurately assessed the respondents' thinking regarding the need for in-service training in the selected subject matter areas.
5. The instrument covered all the important training areas for community nutrition educators.

Definitions of Terms used in this Study

Nutrition education: All types of communication given by community nutrition educators that teach better uses of available food and resources to avert malnutrition, particularly among preschool-age children.

In-service training: Training received by personnel during their period of employment. It involves training through staff seminars, workshops, and staff meetings. It also includes training that staff receive while away from the job which is carried out mostly at educational institutions.

Pre-service training: Organized learning experiences designed for prospective community nutrition education personnel, to prepare them for their future roles.

Nutrition Field Workers: A term used to designate nutrition educators who received in-service training in nutrition

education after having practiced as enrolled nurses or midwives prior to the training.

Community Nutrition Technicians: A term used to designate nutrition educators who received two year pre-service training in nutrition after graduating from high school.

Community nutrition educators: A term used in this study to refer to both Nutrition Field Workers and Community Nutrition Technicians for ease of reference.

District health management team: Personnel who head different sections of the Ministry of health at the district level and are responsible for planning, implementing, and evaluating health programs in the district.

Limitations of the Study

The sample population of the study was in Kiambu District, where the dominant tribe is Kikuyu. Generalizations for other districts may be appropriate for those districts that are similar to Kiambu. However, application of the results of the study to other districts must be done with caution, because they may have different needs and priorities and the community nutrition educators differ from one province to another.

Since the data were collected in Kenya while the researcher was in the United States, the researcher had no direct control on how the data collection exercise was carried out.

CHAPTER 2

LITERATURE REVIEW

This section includes a summary of the literature reviewed in relation to the nutritional status of children in Kenya, the role and functions of nutrition education, the training program for community nutrition educators, the need for nutrition education and in-service training of community nutrition educators, and the need to involve in-service training participants in determining the areas in which they need further training.

The Nutritional Status of Children

The nutritional status of young children is one of the most sensitive indicators of changes in health status and food availability, which act as an early sign of distress and ill health. Nutritional status measures are useful tools because they describe the current status of the child, both in terms of immediate acute factors such as inadequate intake of food and childhood diseases as well as the accumulated impact of chronic deprivation leading to wasting. The measurements of nutritional status indicate changes over time for relatively short periods, as well as reveal the slow accumulation over years of inadequate diet, environment, and child care (Carlson & Wardlaw, 1990).

As reported by Carlson and Wardlaw (1990), about thirty-six percent of children under the age of five in developing countries are malnourished as indicated by

weight-for-age measurements. Thirty-nine percent are stunted using the height-for-age as a measure, while 8.4% are wasted using the weight-for-height measure. Wasting is indicated when a child's weight-for-height falls significantly below what is expected of a child of the same height when compared to the reference population. Wasting indicates current acute malnutrition resulting from failure to gain weight or actual weight loss. Stunting is indicated by low height-for-age stemming from a slowing in the growth of the child, resulting in a failure to achieve expected stature as compared to a child of the same age in the reference population. Stunting is an indicator of cumulative deficient growth. Underweight is a composite measure of stunting and wasting and is indicated by low weight-for-age. This measurement is useful in defining the overall magnitude of the extent of malnutrition and its changes over time. Weight-for-age data are more frequently available as they are used for individual growth monitoring of children (Carlson & Wardlaw, 1990).

A UNICEF (1989a) policy review reported that about one-third of all people in developing countries do not get sufficient calories to allow an active working life. About forty percent of the children under-five in these countries suffer from protein-energy malnutrition. About twenty percent of the infants in these countries are born with low birth weight (2,500 gm. or less). Some forty percent of women of child-bearing age and half the children under-five

suffer from nutritional anaemia.

In 1987, 13% of the infants born in Kenya had low birth weight; 30% of children under the age of five suffered from mild to moderate malnutrition, and 3% suffered from severe malnutrition (UNICEF, 1989b). A United Nations Development Program (UNDP, 1990) report on human development indicated that for the period 1980-1988, 10% of infants aged 12-23 months were wasted and 42% of children between 24-59 months were stunted in Kenya. Data in the literature on the percentage of children who were underweight were not available. For the period 1980-1987, 67% of mothers breast fed their children up to the age of one year.

The child is most affected by malnutrition both in scale and magnitude. By the age of five, most of the growth of the child's brain and body is complete. There is no second chance. If enhancing human capacity is the aim and the measure of real development, then there is no greater priority than maintaining the nutritional health of children in the vital years (UNICEF, 1989a).

In the last decade lack of food in the home was not usually the main cause of malnutrition (UNICEF, 1989b).

Paradoxical as this may seem to a public accustomed to the idea that food shortages, hunger and malnutrition are virtually synonymous, the fact is that a combination of other factors have an even greater influence on nutritional status (UNICEF, 1989b, p.46).

In particular, illness is known to depress appetite, reduce the absorption of food, drain away nutrients, and burn up calories in fever. The frequency of nutritionally

debilitating illnesses among children in poor communities is one of the major causes of poor growth (UNICEF, 1989b).

The UNICEF report further indicated that most parents have not been empowered with today's knowledge about the importance of breast feeding, weaning, the importance of feeding during illness, and the need to regularly check that a child is gaining weight from one month to the next. In addition to these factors, poor nutritional health in pregnancy can lead not only to low birth weight but also to the malnutrition of the child in its early years.

According to the UNICEF report (1989b) the majority of families in the developing countries today can afford an adequate diet. An indispensable part of the solution to the food problem is to mobilize all possible resources to inform and support parents in the use of today's nutritional knowledge (UNICEF, 1989b). This can be achieved by making sure that the personnel who provide nutrition education are well-informed and updated in all aspects pertaining to sound nutrition.

The Role and Functions of Nutrition Education

Vital health indicators such as mortality rates, life expectancy at birth, and nutritional status of young children indicate that health conditions in Kenya have improved considerably. Infant mortality rate (under 1 year) was 124/1000 in 1960 and 71/1000 in 1988; the under five mortality was 113/1000 in the same year, which was an improvement from what it was in 1960 (208/1000). At least

88.4% of children born survive to the age of five years and life expectancy rose from 45 years in 1960 to 59 years in 1987 (UNICEF, 1989b; UNDP, 1990).

However, infant mortality rates are still very high in certain regions of the country. Infectious diseases which are mainly related to people's environmental living conditions are still prevalent. An effective strategy for increased child survival and improved health must therefore link modern health care to relevant social changes in people's environment, thus attacking ill health simultaneously on several fronts. It was noted in the Kenya Development Plan 1979-83 that health constitutes one of the basic needs components. Good health not only implies personal welfare, but also higher labor and higher participation in community development (Central Bureau of Statistics, 1984).

Nutrition is a high priority in the Government of Kenya. For a number of years the Government has shown an active interest in the plight of the under-privileged and the improvement of the nutritional status of the poor is among its first priorities (Jansen et al., 1987). Between 1981 and 1983 a study of infant feeding practices and their determinants was conducted in Kenya by the Central Bureau of Statistics (CBS) and the African Medical Research Foundation (AMREF). The research consisted of an ethnological study in Nairobi, an investigation of the marketing of breast milk substitutes, a study of the knowledge and practices of

health professionals in Kenya, and a cross-sectional study of infant feeding practices of about 1,000 mother/child pairs living in the poorer areas of Nairobi.

The research results were presented at a national workshop and policy related to infant feeding was discussed. The summary of the recommendations included the following:

1. Programs and policies for training in health and other disciplines related to infant feeding.
2. Government regulations and other strategies related to marketing and distribution of breast milk substitutes.
3. Policies and strategies to improve infant feeding through health services.
4. Programs and policies related to public information and education to improve infant feeding.
5. Policies related to women in paid employment.

Improving the nutritional status of the Kenyan people is seen as an integral part of national and social progress. Inadequate nutrition negatively affects childhood mortality, the frequency and range of a wide range of illnesses, physical growth, mental development, and productivity. Adequate nutrition helps to ensure good health, economic attainment and general well being (Jansen et al., 1987). These authors further explained that enhancing nutritional status does not mean providing food in times of famine, epidemics and catastrophe. Malnutrition is a multi-sectoral

problem. It is an integral part of food and agricultural policy and interlinked with the distribution of income and household resources.

The need for nutrition education, especially among peoples of the developing countries, is common knowledge to nutritionists worldwide. However, among the developing world planners, nutrition education has received less attention than other health related needs. At present, nutrition education in Africa is generally communicated in health clinics to parents with malnourished children (Pratt, 1987).

Nutrition education is basically concerned with trying to convince people with different cultural concepts of food and disease, and to motivate them to want to make the changes suggested. Modern nutrition education is concerned with guiding people toward more beneficial modification of their way of life. Nutrition education covers aspects of health concerned with trying to improve directly or indirectly the nutrition of an individual or a community. Although poverty is often an important causative factor in childhood malnutrition, frequently a considerable proportion of the malnutrition seen could be avoided if local food resources were utilized more appropriately by parents (Jelliffe, 1969). Jelliffe further noted that nutrition education is one of the most important methods of combating malnutrition and he suggested that it should be incorporated in all types of health, agricultural, and community

development work and into other extension activities related to community improvement.

Mothibe (1990) noted that there are four broad important factors that contribute to malnutrition in Africa: lack of knowledge about food, nutrition, and health; an insufficient supply of the foods necessary for a balanced diet, often due to lack of production, preservation, or money (poverty); an uneven distribution of food that is available; and infectious diseases.

The basis for any nutrition education program should be to encourage the consumption of a nutritionally adequate diet and to stimulate effective demand for appropriate foods (Mothibe, 1990). She further explains that the general goal of nutrition education is to improve or enhance personal nutritional status, health, and well-being. Acquiring nutrition knowledge will not in itself lead to improved diet practices. It is not only lack of nutrition knowledge that prevents people from making better choices. A person has to make a conscious decision to use the knowledge for it to become useful. Food behavior is complex and frequently involves group as well as individual decisions. Positive approaches that relate to practical concerns of daily living should be priorities in nutrition education.

The range of activities that are undertaken by nutrition educators vary with the nutritional problems present in the community, the community's needs, and the available resources. Nutrition education is characterized

by use of locally available foods or acceptable alternatives. Topics taught also vary with need, but usually include advantages of breast feeding, home prepared weaning foods, maternal diet in pregnancy and lactation and correct use of food supplements, and how to select the most economic and nutritious foods (Mothibe, 1990).

Nutrition education attempts to enable consumers to make optimum use of the available resources to reach valued needs. There is a potential for nutrition education as a promising strategy for combating malnutrition. Emphasis should always be placed on making small changes that will complement existing dietary practices, rather than promoting major changes (Mothibe, 1990).

Given the importance of nutrition education to a nation's development, it is important that health professionals and nutrition educators work with target groups to improve their nutritional status (Pratt, 1987). The efforts of various ministries and organizations should be closely coordinated so that the messages received by families from different sources will complement and reinforce each other (Mothibe, 1990).

Jelliffe (1984) noted that sufficient food supply and sound nutrition for all sections of the population should help in determining the physical quality of life (PQLI) and the development of a country. The achievement of sound nutrition on a national basis depends on many factors such

as policies and programs that need to be modified to suit varying situations.

Sabry (1982) stated that development planners must deal with nutrition considerations and choose among intervention options with explicit objectives of improving the nutritional status of the people.

Training Program for Community Nutrition Education in Kenya

Nutrition studies carried out in 1964 and 1968 by the Ministry of Health in conjunction with WHO and FAO revealed that there was widespread malnutrition in Kenya related to a lack of nutrition knowledge, inability to adjust to changing eating habits and food production patterns, environmental conditions, and technology affecting food availability (Karen College, n.d.). To address the malnutrition problem, the Government of Kenya started a training program for Nutrition Field Workers who would work directly with communities to alleviate the problem. The overall objective of the nutrition education program was to improve the health status of the community through better nutrition.

The first trainees for the program were recruited in 1967 from existing cadres of enrolled nurses and midwives. On completion of a 9-month in-service in community nutrition the trainees were posted to health centers and hospitals throughout the country. They were expected to work with and assist families by teaching them the possible uses of the foods and resources available.

In 1983, as a result of the changing demands on the services of the Nutrition Field Workers, the in-service training program was discontinued and replaced by a two year pre-service training program for high school graduates (Karen College, n.d.). This program prepares Community Nutrition Technicians (CNTs) who, like the Nutrition Field Workers (NFWs), work in hospitals and health centers throughout the country.

The aims of the training program as outlined in the Karen College curriculum are:

1. To train a person who would be able to plan, carry out and monitor nutrition activities in the community aimed at enhancing the health status of the nation through better nutrition.
2. To train a person who would be able to liaise, collaborate and assist the other extension workers, community leaders, and individuals in programs and projects that relate to nutrition.
3. To train a person who was adequately prepared in technical areas of clinical, dietary, epidemiological, preventive, and social aspects of nutrition as well as in the methods of dissemination of nutrition education at the health institutions and in the community.

Both Nutrition Field Workers and Community Nutrition Technicians are expected to carry out and monitor nutrition education activities in the communities assigned to them,

with an aim of improving their nutritional status through better nutrition. They are concerned with trying to persuade people to modify the community's way of life with a view to improving their health and nutrition by the better use of available resources.

The main duties of the community nutrition educators as outlined by the Ministry of Health (Karen College Curriculum) are:

1. Carrying out nutrition education in the communities, hospitals and other institutions.
2. Identifying groups at nutritional risk in the community.
3. Keeping records for monitoring and evaluating nutrition education programs.
4. Monitoring the progress of identified nutritionally vulnerable or affected individuals by visiting them in their homes or through organized groups.
5. Interpreting doctor's prescriptions on therapeutic diets.
6. Supervision of food preparation in hospital kitchens.
7. Counselling and advising patients on home diets.
8. Where necessary, administering supplementary feeding programs.
9. Liaise and collaborate with other extension workers, community leaders and individuals in

programs and projects related to nutrition improvement.

The interpretation of these duties depends on the needs of the communities served, and whether the community nutrition educator is stationed in a health center or in a hospital. For those working in the hospital there is a 3-month rotation. The community nutrition educator can work in a hospital kitchen, in a maternal and child health clinic, or in the field. Those in the field carry out home visits and follow-ups of clients in need, work with other extension agents, and carry out school and community nutrition education duties as may be required.

The Need for Nutrition Education and In-Service Training

Education and training are vital for rural development in Kenya. It is through education and training programs that rural change agents are equipped with the knowledge and skills they need to bring changes to the rural areas (Ongondo, 1985). As long as there is malnutrition in Kenya there is a need for suitably qualified persons to supply the necessary education and information to individuals and families in the community on a continuous and regular basis (Tumuti, 1987). The knowledge and skills required for community nutrition education changes rapidly as a result of improved technology. Hence, it is necessary to keep the community nutrition educators abreast with the rapid changes. An effective nutrition education program requires nutrition educators who can provide individuals and families

with accurate, timely, and practical information and help them to apply it to improve their living standards (Tumuti, 1987). For this reason community nutrition educators must possess adequate and up-to-date knowledge and skills. This can be achieved through in-service training by making it possible for community nutrition educators to proceed to higher levels of professional training through advanced study, or by offering short-term seminars, workshops, short courses, and refresher courses.

In-service education is defined by many educators. According to Harris & Bessent (1969), in-service education is planned activities for the professional improvement of staff members, including all professional activities after initial certification and employment, and does not conclude until there is a termination of service. Bishop (1976) suggested that "in-service bears the brunt for continuity in program quality, for initiation of programs for change and for opportunity for individuals to engage in self examination and renewal."

Educators refer to in-service education by many names including in-service training. Some call it "staff development", some call it "in-service training", and others call it "continuing education". However, according to Harris et al. (1969), other terms that are synonymous with in-service education are job training, continuing education, staff development, renewal, professional growth, and professional development.

Nturibi (1982), in analyzing the need for training of community development extension staff for government and non-governmental organizations, noted that "development is now seen as an internal process engaged in by willing and self-motivated individuals and communities propelled by the will to improve themselves." To mobilize communities to participate in formulating development programs, he said, requires training of extension staff on how to involve community members in planning and decision making. He further explained that this type of development requires extension workers who are committed, sensitive, resourceful, confident, and willing to interact with people so as to guide them in fulfilling their needs. He suggested that existing cadres of extension programs could be re-oriented through in-service training to meet the needs of the communities that they serve.

In the past, in-service training programs in Kenya have been provided as part of continuing education based on the need to orient community nutrition educators on new initiatives that needed to be implemented, such as the Growth Monitoring program which was directed jointly by the Ministry of Health and UNICEF. The program is aimed at providing information on the nutritional status of children and data necessary to guide policy-makers at the national level in making decisions regarding the welfare of children (UNICEF, 1989).

In-service training areas may be determined at the

district level by the District Health Management Team, but they must to be in line with the national goals. The management team defines priority training areas without consulting the participants of the intended training programs. It would be better if the community nutrition educators could decide what they perceive as areas that needed in-service training because they are the ones who work directly with the community and they know the problems they encounter in the process of performing their duties.

The Need to Involve In-Service Training Participants in Determining Areas for Further Training

Brahee (1989) indicated that in order for an organization to accomplish its stated mission, it must have a cadre of people who possess the professional and technical skills necessary to fulfill their roles as productive employees of the organization. Many times discrepancies exist between what the management of an organization perceives as its needs and what the employees perceive as their needs.

In defining "need" Swap (1987) noted that it is often difficult to discriminate between what training is needed and what training might be seen as desirable. Need can be defined as a factor without which a person or group cannot function adequately. The critical question is who should define the need. Swap suggested that the needs of potential in-service program participants as they perceive them should be the basis for the program. "Needs assessment" has been defined by many authors (Knowles, 1970; Stufflebeam et al.,

1985). Swap (1990) defined needs assessment as the "systematic process of gathering information about needs." She suggested several advantages of collecting this information in a systematic way:

1. Soliciting broad participation through a needs assessment builds awareness about the in-service program.
2. Needs assessment contributes to good program design.
3. When programs reflect the needs that were expressed (by potential participants), high participation generally results.
4. Data from needs assessment can be used to justify requests for initiating or terminating particular programs.

The primary goal of identifying needs is to infuse the resulting information into the total process of program planning (Kowalski, 1988). He defined needs as the interspace between present behavior and desired behavior or gaps between present competencies and desired competencies. Kowalski further explained that felt needs are self-identified and represent a conscious awareness by the learners of needs they desire to gratify. He noted that it is argued that felt needs are the most important type of need with regard to adult learners. This conclusion stems from the belief that felt needs are the strongest motivator urging persons to actually enroll in training programs

(Kowalski, 1988). Stroether (1982) noted that the assessment of needs is a basis for program planning. He further explained that needs are not static and they increase or decrease in strength as a result of ongoing experiences.

Maalof and Contado (1983) noted that extension agents may have received the best pre-service training, but they still need to update their knowledge periodically through in-service training programs. These authors also recognized the pitfalls of training programs. They concurred with Benor and Harrison (1983) in summarizing the purposes of in-service training as follows:

1. To cope with the constant changes in the problems faced in given localities.
2. To cope with constant changes in knowledge and skills.
3. To make adjustments to changes in the patterns of behavior of the beneficiaries of the program.
4. To learn aspects of the program not covered during the pre-service basic training.
5. To learn about new procedures, approaches, techniques and teaching in the delivery of the program.

Holly and Blackman (1981), in discussing staff development and in-service training, outlined a system that could be used to evaluate and develop programs. Their system considered five essential factors: attitude,

climate, content, organization, and time. They proposed that the first necessary ingredient of a program conducive to development is active commitment on the part of persons in leadership positions to the concepts of growth, life-long learning, and change. Active commitment included participation and involvement in professional development. Staff development is a process collectively engaged in. It is not something one does to another but rather, with another. A shared sense of purpose and goals provide direction to program development. They further suggested that a psychological climate conducive to growth is non threatening and can be characterized by trust, by individuals' willingness to experiment, share, question, and where individuals are respected. A climate of this nature is "conducive to individual and group exploration, discovery, creativity, and hypothesizing; to group analysis and learning from mistakes" (p.5).

The essential parts (content) of any in-service training must be relevant to the audience who receive it. When programs are planned to support individual, group, and institutional goals or objectives and when the participants are actively involved in the assessment in their areas of professional development, experiences are usually perceived to be of high personal value.

The overall structure for the professional development activities should be flexible, responsive, and uni-dimensional to reflect and be supportive of content and

goals (both short and long term). An opportunity for participants to interact and have input in the group helps to assure that experiences will be relevant and address actual concerns of individuals and group goals.

During the past decade, the demand for effective staff development programs has steadily increased as a response to changes and pressures which have been added to the educational field, and therefore to the work of the extension workers (in health, agriculture, social services, etc.). Equipping extension workers with necessary skills and knowledge to handle the added responsibilities has in many cases become the task of in-service training programs (Page, 1985).

The best way to insure a productive experience may be to involve the participants of in-service training in identifying the needs and goals for professional development. Adults learn best when the learning experience is important and meaningful to them, not when the format and content of the experience is determined by others (Swap, 1987). Szcypkowski (1980) noted that the assessment of learner needs is one of five generic processes present for each program cycle. Long (1977) noted that learning which affects change in behavior is the overall goal of staff development. He said change is likely to occur when learners perceive in-service experiences to be meaningful and nonthreatening. He suggested that staff development efforts focus on helping individuals resolve, in a way free

of personal threat, the problems they perceive to be relevant to their situation. The major features of effective needs assessment procedures include attention to both current and changed competence, identification of gaps to be closed by educational activities, and information from potential participants to encourage commitment to change (Nowlen, 1980). Boyle (1981) noted that the involvement of potential clientele is important for the development of effective educational programs.

Goldstein (1974) noted that many programs fail because trainers are more interested in conducting the training program than in assessing the needs of the organization. He suggested that needs assessment consist of:

1. Organization analysis which starts with an examination of the short and long-term goals of the organization as well as the trends that are likely to affect these goals.
2. Task analysis which is a careful analysis of the job to be performed by the trainees upon completion of the training program. All the tasks required on the job should be denoted, so that the particular knowledge, skills, and attitudes required to perform the job are clear.
3. Personal analysis which involves an identification of behaviors required of individuals who will be in the training program.

Jones and Lowe (1990) noted that all in-service and professional development activities should be set in larger context in which they contribute to explicit program goals. They viewed staff development as a continuous process. Activities should be planned and implemented to a significant degree by the clients to be served. They viewed bottom-up orientation, as opposed to the more typical top-down orientation where in-service sessions are planned primarily by administrators, as important for both practical and symbolic reasons: Not only are program participants the best source of information about their own learning needs, they are more likely to "buy in" to activities they have helped to identify or plan.

Smith and Woeste (1983) reported that many in-service educational programs are implemented before any evaluation of possible outcomes is undertaken. The in-service should be efficient in meeting the needs of participants. If it fails to address the needs even if it has perfectly valid content, its impact will be limited at best. On the other hand, poorly designed in-service, even if targeted to an identified need may also have limited impact. They identified relevant criteria to be examined at the pre-implementation stage of in-service education:

1. Worthiness of the objectives: Do the objectives support the program's mandates and goals?

2. Appropriateness of program to situation: Is the performance problem addressed one that is best solved through an educational program?
3. Appropriateness of course content/activities to objectives: Are experiences appropriate for the expected later behavior of the participants?
4. Appropriateness of pre-program publicity: Does the title clearly identify the content? Is there a clear statement of the objectives and the depth and breadth of content to be covered?
5. Qualification of staff: Do staff credentials provide evidence of competence in the content area of the in-service program and in the process of teaching?
6. Efficiency of resources planned: Are resources available to cover costs of the program?
7. Comprehensiveness of evaluation plans: Are objectives written in measurable terms?

Wood and Thompson (1980) presented a list of principles related to adult learning that are relevant to staff development programs. The list included the following:

1. Adults will commit to learning something when the goals and objectives of the in-service are considered realistic and important to the job and perceived as being immediately useful.

2. Adults will learn, retain and use what they perceive is relevant to their professional and personal needs.
3. Adults want to be the origins of their own learning; that is involvement in the selection of objectives, content, activities and assessment of in-service education.
4. Adults will resist learning situations which they believe are an attack on their competence, thus resistance to imposed in-service topics and activities.

Summary

One of the most important pieces of information that can be gathered from the literature on in-service training programs and adult learning is that effective in-service is dependent upon the offering of activities that are agreeable with the needs perceived by the learner. The literature cited supports the need to involve potential participants of in-service training programs in needs assessment.

The review of the nutritional status indicated that if nutrition education is applied the prevailing nutrition problems can be improved and future problems averted. The literature also indicated that measurements of nutritional status are an indicator of a country's physical quality of life (PQLI) and are useful for planning purposes. Nutrition education, it was noted, should be incorporated in all types of health, agricultural, and community development work.

Participants of such programs can play an important role in determining the areas in which they need further training. Frequent in-service training is important to keep the staff updated in current knowledge and skills.

CHAPTER 3

RESEARCH METHODS AND PROCEDURES

The purpose of this research was to determine the perceived in-service training needs of community nutrition educators in selected subject matter areas for the delivery of nutrition education in Kiambu District in Kenya. The study sought to determine what the community nutrition educators perceived as areas which needed in-service training to enable them to meet the changing needs of the communities they serve. The research methods and procedures utilized to achieve the purpose of this study are presented in this chapter as follows:

1. Description of research method
2. Study population
3. Instrumentation
4. Data collection
5. Data analysis

Description of Research Method

A descriptive research design was employed in this study. Descriptive research ordinarily has an empirical base and may be employed in the contrasting of two or more conditions using statistical analysis. Typically studies involving needs assessments, competency identification, and demographic descriptions may be classified under this research type (Courtney, 1988). This research sought answers to the following questions:

1. What are the in-service training needs in selected subject matter training areas as perceived by community nutrition educators?
2. What are the relationships between selected demographic characteristics and respondent's perceptions regarding in-service training needs?

Study Population

The sample for this study was composed of the 25 community nutrition educators in Kiambu District, one of the five Districts in Central Province. Within this group there were 17 Nutrition Field Workers and 8 Community Nutrition Technicians. By representing the entire population, it was assumed that sampling error would be eliminated, the power of the statistical test would increase when applied to the sample, and confidence would be greater in the findings (Borg, 1983).

Since the data of this study were collected in Kenya while the researcher was in the USA, selecting the location of the study was a major consideration. Availability of reliable persons to collect the data was the determining factor of location, and therefore, population. In selecting the community nutrition educators as the subjects of this study, the researcher was convinced that the community nutrition educators were in the best position to identify what they needed to learn in relation to their job because they are aware of the difficulties they encounter in the

process of performing their duties. They are also the beneficiaries of the recommendations proposed in this study.

Data Collection Instrumentation

A questionnaire was developed to gather the information for the study (Appendix B). The content of the questionnaire was based on information obtained from the literature review and the Karen College curriculum (Appendix C) used for the pre-service training of community nutrition educators. The questionnaire was divided into two parts. The first part covered the demographic information of the subjects used in the study. The data collected were on: job title, work place, division in which respondent was assigned to work, work experience on current job, year of completing training in nutrition, highest level of education attained, and age.

The second section assessed the perceived in-service training needs of community nutrition educators in the following selected subject matter areas: nutrition surveillance, family health, family resource management, environmental health, food science and technology, family food production, hospital kitchen management, therapeutic diets, diet modification, laboratory food practices, social psychology, communication, community nutrition, food and nutrition, handicrafts and other areas that the community nutrition educators thought were important. Each of these areas was broken down into sub-topics. The community nutrition educators were asked to indicate how much in-

service training they thought was needed in each of the sub-topics, by rating on a four point Likert-type scale. The choices were: 4=very much needed, 3=needed, 2=somewhat needed, and 1=very little need. A 4-point Likert scale was chosen because: (a) it restricted the respondents from opting for a middle and perhaps a noncommitting position on the scale (Courtney, 1990) and (b) a 6-point scale was considered to have too many options, which might confuse the respondents.

To determine whether the questionnaire was well developed, content validity was established by a group of experts. Five experts with experience ranging from questionnaire construction to nutrition education were asked to evaluate the questionnaire in terms of clarity, ability of the items to measure the objectives, length of the questionnaire, and any other factors recommended for improving the questionnaire. Three of the group members were affiliated with Oregon State University, but represented different fields: an extension nutrition specialist, a professor in educational measurements, and a doctoral candidate in Human Development and Family Sciences. The other two were graduate students from Africa who are familiar with the nutrition education programs in Africa. One was a doctoral candidate at Iowa State University from Kenya who had taught at Karen College of Nutrition; the other was a master of science candidate in nutrition at Maine State University from Benin (West Africa). Based on

collective input, changes and revisions were made to the questionnaire.

Data Collection Procedure

A cover letter was written to accompany the questionnaire explaining to the respondent's the purpose of the study and requesting the respondents' assistance. The letter included a statement of confidentiality (Appendix A). The data collection procedures were accomplished in chronological order as follows:

1. All questionnaires and cover letters were mailed in one large envelope to Mr. Muchiri, Health Education Officer, Ministry of Health in Kenya in January 1991.
2. Mr. Muchiri administered the questionnaires personally to the community nutrition educators in Kiambu District in February 1991.
3. After three weeks the researcher contacted Mr. Muchiri concerning data collection.
4. After receiving the completed questionnaires in March 1991 the researcher tabulated, analyzed, and interpreted the data.

Data Analysis

Frequency distributions were counted for each training area. Percentages and means were computed from the frequencies. Chi-square analysis was applied to the data to determine if significant relationships existed for the chosen demographic characteristics.

CHAPTER 4

RESULTS AND FINDINGS

The purpose of this study was to determine the in-service training needs of community nutrition educators in selected subject matter areas for the delivery of nutrition education in Kiambu District in Kenya. Specifically, the study sought responses to the following questions:

1. What are the in-service training needs in selected subject matter areas as perceived by community nutrition educators?
2. What are the relationships between selected demographic characteristics and the respondent's perceptions regarding in-service training needs?

The results of the study are presented in this chapter. The data were entered on the computer and numerical values assigned. Statistical analysis of the data was performed through the use of the Statistical Package for Social Sciences (SPSS-X). The first research question was descriptive in nature. Frequency distributions, mean scores, and percentages of each topic were computed and are reported in Table 2a to 2o. Chi-square analysis (Kerlinger, 1986) was used to determine if there were significant relationships when using job title, experience, work place and age as variables. The results of chi-square are presented in Tables 4 to 7.

Respondent Information

The questionnaire was administered to 25 community nutrition educators who were working in Kiambu District at the time of the study; all responded to the questionnaire.

Of the 25 respondents, 17 (68%) were Nutrition Field Workers (NFWs) and eight (32%) were Community Nutrition Technicians (CNTs). Of the 17 Nutrition Field Workers, eight were based in hospitals and eight in health centers. Of the eight Community Nutrition Technicians, five were based in hospitals and three in health centers. The majority (48%) of the respondents had attained the Kenya Certificate of Education. Among the NFWs five had attained the Certificate of Primary Education, seven had received Kenya Junior Secondary Education, and five had the Kenya Certificate of Education. Among the CNTs, seven had the Kenya Certificate of Education and one had the Kenya Advanced Certificate of Education. Sixteen (64%) of the respondents had completed training between 1968 and 1983, while nine (36%) had completed between 1984 and 1990. Respondents' work experience ranged from 1 to 26 years; their ages ranged from 20 to 50 years. A summary of the respondent information is presented in Table 1.

Table 1
Respondent Information

Variable	Number	Percent
Job Title		
Nutrition Field Workers	17	68
Community Nutrition Technicians	8	32
Total	25	100
Work Place		
Health center	11	44
Hospital	13	52
*	-	-
Total	24	98
Highest Level of Education		
Certificate of Primary Educ.	5	20
Kenya Junior Secondary Educ.	7	28
Kenya Certificate of Educ.	12	48
Kenya Advanced Certificate of Educ.	1	4
Total	25	100
Year Training Completed		
68-79	4	16
80-83	12	48
84-90	9	36
Total	25	100
Number of Years in Current Job		
1-3 Yrs	5	20
4-8 Yrs	9	36
9-13 Yrs	9	36
14 Yrs or more	2	8
Total	25	100
Age		
20-25 Yrs	4	16
26-30 Yrs	4	16
31-35 Yrs	6	24
36-40 Yrs	4	16
41-45 Yrs	5	20
46-50 Yrs	2	8
Total	25	100

Note: * One respondent did not indicate work place

Analysis of Perceived In-Service Training Needs

The first research question dealt with the perceived in-service training needs of community nutrition educators in 15 subject matter areas: nutrition surveillance, family health, family resource management, environmental health, food science and technology, family food production, hospital kitchen management, therapeutic diets, diet modification, food laboratory practice, social psychology, communication, community nutrition, food and nutrition, and handicrafts. Each subject matter area was divided into sub-topics, which were analyzed independently. The respondents had four options to choose: 4=Very Much Needed, 3=Needed, 2=Somewhat Needed, and 1=Very Little Need for items that the respondents thought needed very little or no in-service training. Items with 50% or more responses on needed or very much needed were considered important for in-service training and will be identified in the discussion. The results are presented in Table 2a to 2o.

Nutrition Surveillance. The community nutrition educators perceived six topics in the area of nutrition surveillance to be very much needed for in-service training programs: types of nutrition surveys (60%), groups at nutritional risk (60%), factors contributing to chronic malnutrition (56%), assessment of nutritional status (56%), data collection (52%), and program planning (52%). Factors affecting food supply (52%) was perceived as a needed topic for in-service training programs. The topics with the

highest mean scores were: groups at nutritional risk (3.520), assessment of nutritional status (3.440), use of statistics in analyzing data (3.429), and types of nutritional surveys (3.417) as indicated in Table 2a.

Family Health. All the topics in the area of family health were perceived as very much needed for in-service training programs. Caring for the premature (72%), normal growth and development (68%), immunization (64%), childhood diseases (60%), pre-natal health (60%), diarrheal diseases (60%), child spacing (60%), and care of the new born (56%).

Topics with the highest mean scores were: prenatal health (3.400), normal growth and development (3.520), caring for the premature (3.520), child spacing (3.360), childhood diseases (3.360), and diarrheal diseases (3.440), as shown on Table 2b.

Family Resource Management. Identifying family goals and values (52%), was perceived as very much needed topic for in-service training programs in the area of family resource management. Nature of family resource management (64%) was perceived as a needed topic for in-service training programs. Identifying family goals and values was the topic with the highest mean score (3.320) in this area as indicated in Table 2c.

Table 2a

Perceptions of Importance of In-service Training Needs
in "Nutrition Surveillance" (n=25)

Sub-Topics	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
1. Factors affecting food supply	3.240	0	0	3	12	13	52	9	36
2. Dietary survey methods	3.200	2	8	1	4	12	48	10	40
3. Groups at nutritional risk	3.520	0	0	2	8	8	32	15	60
4. Factors contributing to chronic malnutrition	3.333	3	12	0	0	7	28	14	56
5. Assessment of nutritional status	3.440	1	4	1	4	9	36	14	56
6. Data collection	3.240	2	8	3	12	7	28	13	52
7. Record keeping and monitoring	3.160	0	0	5	20	11	44	9	36
8. Types of nutrition surveys	3.417	1	4	3	12	5	20	15	60
9. Planning nutrition surveys	2.880	2	8	8	32	6	24	9	36
10. Use of statistics in analyzing data	3.333	0	0	1	4	10	40	10	40
11. Program planning	3.333	2	8	1	4	8	32	13	52

Table 2b
Perceptions of Importance of In-service Training Needs
in "Family Health" (n=25)

Sub-topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
12. Pre-natal health	3.400	1	4	1	4	8	32	15	60
13. Normal growth and development	3.520	1	4	2	8	5	20	17	68
14. Care of the new born	3.200	4	16	1	4	6	24	14	56
15. Caring for the premature	3.520	2	8	1	4	4	16	18	72
16. Child spacing	3.360	3	12	0	0	7	28	15	60
17. Immunization	3.120	6	24	1	4	2	8	16	64
18. Childhood diseases	3.360	2	8	2	8	6	24	15	60
19. Diarrheal diseases	3.440	2	8	0	0	8	32	15	60

Table 2c

Perceptions of Importance of In-Service Training Needs
in "Family Resource Management" (n=25)

Sub-topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
20. Nature of family resource management	3.160	1	4	1	4	16	64	7	28
21. Identifying family goals and values	3.320	1	4	3	12	8	32	13	52
22. Identifying personal, family and community resources	3.125	1	4	5	20	8	32	10	40
23. Management of personal and family resources	3.250	2	8	0	0	12	48	10	40

Environmental Health. As indicated in Table 2d, three topics in environmental health area were perceived as very much needed: food hygiene (64%), food quality control (56%), and water supply (52%). Water supply (3.360), food hygiene (3.440), and communicable diseases (3.473) were the topics with the highest mean scores in this area.

Food Science and Technology. In the area of food science and technology, toxins in food (76%), food processing and preservation (60%), and analysis of food (52%) were perceived as very much needed topics for in-service training programs. Methods of sampling (60%) was perceived as a needed topic.

Analysis of food (3.360), toxins in food (3.708), and food processing and preservation (3.375), had the highest mean scores in this area as indicated in Table 2e.

Table 2d

Perceptions of Importance of In-Service Training Needs
in "Environmental Health" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
24. Water supply	3.360	1	4	2	8	9	36	13	52
25. Food hygiene	3.440	2	8	1	4	6	24	16	64
26. Food quality control	3.240	2	8	4	16	5	20	14	56
27. Communicable diseases	3.473	0	0	1	4	10	40	12	48
28. Housing	2.750	2	8	8	32	8	32	6	24
29. Waste disposal	3.043	1	4	4	16	11	44	7	28

Table 2e

Perceptions of Importance of In-Service Training Needs
in "Food Science and Technology" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
30. Analysis of food	3.360	1	4	2	8	9	36	13	52
31. Methods of sampling	3.000	2	8	2	8	15	60	6	24
32. Food composition	3.280	1	8	2	8	11	44	11	44
33. Chemical properties of food	3.200	2	8	3	12	8	32	12	48
34. Toxins in food	3.708	1	4	0	0	4	16	19	76
35. Food processing and preservation	3.375	2	8	2	8	5	20	15	60
36. Food additives and fortification	3.250	2	8	2	8	8	32	12	48

Family Food Production. Only one item in this area was perceived as very much needed: food preservation and storage (52%). Food preservation and storage had the highest mean score in this area as shown in Table 2f.

Table 2f

Perceptions of Importance of In-Service Training Needs
in "Family Food Production" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
37. Planning a kitchen garden	3.000	4	16	1	4	11	44	9	36
38. Selecting crops for the kitchen garden	2.840	2	8	6	24	11	44	6	24
39. Pest and disease control	2.920	3	12	4	16	10	40	8	32
40. Fertilizer and manure application	2.800	5	20	3	12	9	36	8	32
41. Food preservation and storage	3.333	2	8	1	4	8	32	13	52
42. Selection and management of livestock	2.875	3	12	4	16	10	40	7	28

Hospital Kitchen Management. In the area of hospital kitchen management, all the topics were perceived as very much needed: safety measures in the kitchen (64%), food service in hospital kitchens (64%), food purchasing in hospital kitchens (60%), and meal planning (56%). Food purchasing in hospital kitchens (3.400) and safety measures in the kitchen had the highest mean scores in this area as indicated in Table 2g.

Table 2g

Perceptions of Importance of In-Service Training Needs
in "Hospital Kitchen Management" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
43. Safety measures in the kitchen	3.360	3	12	1	4	5	20	16	64
44. Food purchasing in hospital kitchens	3.400	2	8	1	4	7	28	15	60
45. Food service in hospital kitchens	3.318	2	8	3	12	4	16	16	64
46. Meal planning	3.250	3	12	2	8	5	20	14	56

Therapeutic Diets. Three topics out of the four in the area of therapeutic diets were perceived as very much needed: importance of diet counselling (56%), patient's life situation and food habits (56%), and assessment of nutritional needs (52%). The topic with the highest mean score in this area was importance of diet counselling (3.440) shown in Table 2h.

Table 2h

Perceptions of Importance of In-Service Training Needs
in "Therapeutic Diets" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
47. Importance of diet counselling	3.440	0	0	3	12	8	32	14	56
48. Patient's life situation and food habits	3.292	2	8	3	12	5	20	14	56
49. Formulation of dietary history	3.160	2	8	2	8	11	44	10	40
50. Assessment of nutritional needs	3.292	1	4	4	16	6	24	13	52

Diet Modification. All except one of the topics related to diet modification were perceived as very much needed for in-service training. Dietary modification for metabolic and nervous disorders (76%), dietary modification for cardiovascular and renal disorders (72%), dietary modification in children's disorders (72%), dietary modification in gastrointestinal tract disturbances (64%), modification of normal diet for calories and proteins (64%), dietary modification for surgical conditions (56%), and diet in anaemia (52%).

Modification of normal diet for calories and proteins (3.455), dietary modification in gastrointestinal tract disturbances (3.480), dietary modification for surgical

conditions (3.375), dietary modification for metabolic and nervous disorders (3.680), dietary modification for cardiovascular and renal disorders (3.600), and dietary modification in children's disorders (3.520) were the topics with the highest mean scores in this area as indicated in Table 2i.

Food Laboratory Practice. Methods of cooking (56%) and effects of food preparation and cooking on nutrients (56%), were perceived as very much needed topics for in-service training programs related to food laboratory practices. Effects of food preparation and cooking on nutrients was the item with the highest mean score as indicated in Table 2j.

Social Psychology. None of the topics related to social psychology was perceived to be very much needed. One topic was perceived as a needed topic: interpersonal relationships (56%). Motivation (3.364) and socialization (3.391) were the topics with the highest mean score as shown in Table 2k.

Table 2i

Perceptions of Importance of In-Service Training Needs
in "Diet Modification" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
51. Reasons for diet modification	3.080	3	12	2	8	10	40	10	40
52. Modification of normal diet for calories and proteins	3.455	1	4	2	8	6	24	16	64
53. Dietary modification in gastro-intestinal tract disturbances	3.480	1	4	0	0	6	24	16	64
54. Dietary modification for surgical conditions	3.375	1	4	3	12	6	24	14	56
55. Dietary modification for metabolic and nervous disorders	3.680	1	4	0	0	5	20	19	76
56. Dietary modification for cardiovascular and renal disorders	3.600	1	4	0	0	5	20	18	72
57. Dietary modification in children's disorders	3.520	2	8	1	4	4	16	18	72
58. Diet in anaemia	3.250	2	8	3	12	6	24	13	52

Table 2j

Perceptions of Importance of In-Service Training Needs
in "Food Laboratory Practice" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
59. Methods of cooking	3.208	2	8	5	20	3	12	14	56
60. Effects of food preparation and cooking on nutrients	3.286	2	8	2	8	6	24	14	56
61. Experimental cookery	2.913	1	4	5	20	9	36	7	28

Table 2k

Perceptions of Importance of In-Service Training Needs
in "Social Psychology" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
62. Role of social psychology	3.333	0	0	2	8	12	48	10	40
63. Interpersonal relationships	3.000	0	0	5	20	14	56	5	20
64. Personality assessment	3.043	1	4	4	16	11	44	7	28
65. Group interactions	3.000	2	8	3	12	12	48	7	28
66. Cultural values and practices	3.208	2	8	2	8	9	36	11	44
67. Attitude change	3.250	2	8	1	4	10	40	11	44
68. Motivation	3.364	1	4	1	4	9	36	11	44
69. Socialization	3.391	1	4	1	4	9	36	12	48

Communication. The respondents perceived communication process (60%) and planning and problem solving (52%) as very much needed topics for in-service training programs related to the communication area. Needs assessment techniques (52%) was perceived as a needed topic for in-service training programs. In this area communication process (3.435), guidance and counselling (3.391), and facilitation and teaching strategies (3.435) had the highest mean scores as shown in Table 21.

Table 21
Perceptions of Importance of In-Service Training Needs
in "Communication" (n=25)

Sub-Topics	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
70. Communication process	3.435	2	8	1	4	5	20	15	60
71. Needs assessment techniques	3.273	1	4	0	0	13	52	8	32
72. Planning and problem solving	3.261	2	8	3	12	5	20	13	52
73. Leadership strategy	3.125	1	4	3	12	12	48	8	32
74. How adults learn	3.250	0	0	6	24	6	24	12	48
75. Motivation and learning theory	3.125	1	4	5	20	8	32	10	40
76. Guidance and counselling	3.391	1	4	1	4	9	36	12	48
77. Selection and use of teaching aids	3.174	2	8	2	8	9	36	10	40
78. Facilitation and teaching approaches	3.435	0	0	1	4	11	44	11	44
79. Micro teaching and evaluation	3.318	0	0	4	16	7	28	11	44

Community Nutrition. Only one topic, deficiency diseases prevention and cure (52%), was perceived as very much needed in the area of community nutrition. Inter-

sectoral collaboration (52%) was perceived as a needed topic. Deficiency diseases prevention and cure (3.333) and effects of excess nutrients in the body (3.333) were the topics with the highest mean scores in this area as indicated in Table 2m.

Table 2m

Perceptions of Importance of In-service Training Needs
in "Community Nutrition" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
80. Food taboos and their effects	3.083	4	16	1	4	8	32	11	44
81. Eating habits	3.000	5	20	2	8	5	20	12	48
82. Causes and effects of malnutrition	3.167	3	12	2	8	7	28	12	48
83. Deficiency diseases prevention and cure	3.333	2	8	1	4	8	32	13	52
84. Effects of excess nutrients in the body	3.333	0	0	3	12	10	40	11	44
85. Intersectoral collaboration	3.250	1	4	1	4	13	52	9	36
86. Primary health care concept	3.261	2	8	2	8	7	28	12	48

Food and Nutrition. All except two of the topics in the area of food and nutrition were perceived as very much

needed: nutrition in infancy (64%), weaning diets (64%) nutrition requirements during lactation (60%), nutrient content of food (60%), nutrition during pregnancy (60%) and functions of nutrients in the body (52%). Nutrient content in food (3.333), nutrition in infancy (3.333) and weaning diets (3.333) were the topics with the highest mean score in this area as shown in Table 2n.

Table 2n

Perceptions of Importance of In-Service Training Needs
in "Food and Nutrition" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
87. Functions of nutrients in the body	3.208	2	8	4	16	5	20	13	52
88. Nutrient content of food	3.333	3	16	1	4	5	20	15	60
89. Planning balanced diets from locally produced foodstuffs	3.125	3	12	3	12	6	24	12	48
90. Nutrition during pregnancy	3.167	4	16	3	12	2	8	15	60
91. Nutrition requirements during lactation	3.250	3	12	3	12	3	12	15	60
92. Nutrition in infancy	3.333	3	12	2	8	3	12	16	64
93. Weaning diets	3.333	4	16	0	0	4	16	16	64
94. Nutrition in adolescence	3.042	5	20	1	4	6	24	12	48

Handicrafts. None of the topics in this area was perceived as very much needed. Two topics were perceived as needed: pattern drafting (60%) and knitting (60%) as indicated in Table 2o.

Table 2o

Perceptions of Importance of In-Service Training Needs
in "Handicrafts" (n=25)

Sub-Topic	Mean	Very little need		Somewhat needed		Needed		Very much needed	
		F	%	F	%	F	%	F	%
95. Selecting and purchasing family clothing	2.833	3	12	5	20	9	36	7	28
96. Garment design	2.583	3	12	7	28	11	44	3	12
97. Pattern drafting	3.000	1	4	2	8	15	60	5	20
98. Embroidery	2.739	4	16	3	12	11	44	5	20
99. Knitting	2.783	3	12	2	8	15	60	3	12

Table 3 summarizes the highest mean scores which represent 25% of the total selected subject matter items the community nutrition educators perceived to be the most needed topic for in-service training based on the mean scores of each topic. For the topics which had the same mean, the topics with a lower standard deviation were placed in higher rank than the topics with higher or greater standard deviation.

Table 3
Mean Scores and Rank Order of Topics Perceived
to Be Most Important

Item No.	Sub-Topic	Mean	SD	Rank
34	Toxins in food	3.708	.690	1
*55	Dietary modification for metabolic and nervous disorders	3.680	.690	2
*56	Dietary modification for cardiovascular renal disorders	3.600	.764	3
3	Groups at nutritional risk	3.520	.653	4
**13	Normal growth and development	3.520	.823	5
**15	Caring for the premature	3.520	.918	6
*57	Dietary modification in children's disorders	3.520	.918	7
*53	Dietary modification in gastrointestinal tract disturbances	3.480	.872	8
27	Communicable diseases	3.473	.593	9
*52	Modification of normal diet for calories and proteins	3.455	.823	10
78	Facilitation and teaching approaches	3.453	.590	11
47	Importance of diet counselling	3.440	.712	12
**19	Diarrheal diseases	3.440	.870	13
25	Food hygiene	3.440	.917	14
70	Communication process	3.435	.945	15
8	Types of nutrition surveys	3.417	.881	16

Table 3 continued

Item No.	Sub-Topic	Mean	SD	Rank
5	Assessment of nutritional status	3.400	.768	17
**12	Prenatal health	3.400	.770	18
44	Food purchasing in hospital kitchens	3.400	.913	19
76	Guidance and counselling	3.391	.783	20
69	Socialization	3.391	.783	21
*54	Dietary modification for surgical conditions	3.375	.875	22
35	Food processing and preservation	3.375	.970	23
68	Motivation	3.364	.790	24
24	Water supply	3.360	.810	25
30	Analysis of food	3.360	.810	26
**18	Childhood diseases	3.360	.952	27
**16	Child spacing	3.360	.995	28

*Dietary Modification Topics

**Family Health Topics

Analysis of Relationships for Research Question 2

The second question of this study dealt with determining if there was a relationship between the community nutrition educators' perceived in-service training needs and their job title, experience on current job, work place, and age. Chi-square was used to determine for each item the relationships of the respondents' perceptions. Only the results for chi-squares which were significant are

reported. The .05 level of confidence was used to determine the significance.

Job Title. Nutrition Field Workers and Community Nutrition Technicians constituted the two groups based on job title. The responses to the following topics were significantly related to job title: planning nutrition surveys, motivation, socialization, and needs assessment techniques. The Community Nutrition Technicians expressed a greater need (higher percentage) for in-service training than did the Nutrition Field Workers. The chi-square analysis is presented in Table 4.

Experience on Current Job. The work experience was used to differentiate two groups; 1-8 years (less experienced); 9 or more (more experienced) years on the current job. The responses to modification of normal diet for calories and proteins, socialization, and nutrient content in food were significantly related to job experience. The less experienced respondents expressed a higher need than did the more experienced respondents as shown in Table 5.

Work Place. The health center and the hospital constituted the two groups based on work place. The responses to management of personal and family resources, pest and disease control, role of social psychology, intersectoral collaboration, primary health care concept, and embroidery were significantly related to work place. The health center based respondents expressed a greater need

for these topics than did hospital based respondents as indicated in Table 6.

Table 4

Significant Relationships Between Respondents' Perceived
In-Service Training Needs and Their Job Title

Ratings	NFWs(%)	CNTs(%)
Planning nutrition surveys		
1=Very little need	5.9	12.5
2=Somewhat needed	41.2	12.5
3=Needed	35.3	0.0
4=Very much needed	17.6	75.0
Chi-square =9.48989 p=.0234 df=3 n=25		
Motivation		
1=Very little need	0.0	14.3
2=Somewhat needed	6.7	0.0
3=Needed	60.0	0.0
4=Very much needed	33.3	85.7
Chi-square=9.42857 p=.0241 df=3 n=22		
Socialization		
1=Very little need	0.0	12.5
2=Somewhat needed	6.7	0.0
3=Needed	60.0	0.0
4=Very much needed	33.3	87.5
Chi-square=10.14236 p=.0174 df=3 n=23		
Needs assessment techniques		
1=Very little need	0.0	12.5
2=Somewhat needed	0.0	0.0
3=Needed	78.6	25.0
4=Very much needed	21.4	62.5
Chi-square=6.58413 p=.0372 df=2 n=22		

Table 5

Significant Relationships Between Respondents' Perceived In-Service Training Needs and Their Current Job Experience

Ratings	Less experienced(%)	More experienced(%)
Modification of normal diet for calories and proteins		
1=Very little need	7.1	0.0
2=Somewhat needed	0.0	18.2
3=Needed	7.1	45.5
4=Very much needed	85.7	36.4
Chi-square=9.44264 p=.0239 df= 3 n= 25		
Socialization		
1=Very little need	7.7	0.0
2=Somewhat needed	7.7	0.0
3=Needed	15.4	70.0
4=Very much needed	85.7	30.0
Chi-square=7.51432 p=.0572 df=3 n=23		
Nutrient content in food		
1=Very little need	7.7	18.2
2=Somewhat needed	7.7	0.0
3=Needed	0.0	45.5
4=Very much needed	84.6	36.4
Chi-square =9.49930 p=.0233 df=3 n=24		

Table 6

Significant Relationships Between Respondents' Perceived In-Service Training Needs and Their Work Place

Ratings	Health Center(%)	Hospital(%)
Management of personal and family resources		
1=Very little need	0.0	16.7
2=Somewhat needed	0.0	0.0
3=Needed	36.4	66.7
4=Very much needed	63.6	16.6
Chi-square=6.07912 p=.0479 df=2 n=23		
Pest and disease control		
1=Very little need	0.0	23.1
2=Somewhat needed	0.0	30.8
3=Needed	54.5	23.1
4=Very much needed	45.5	23.1
Chi-square=6.39161 P=.0386 df=3 n=24		
Role of social psychology		
1=Very little need	0.0	0.0
2=Somewhat needed	0.0	15.4
3=Needed	27.3	69.2
4=Very much needed	72.7	15.4
Chi-square=8.49231 p=.0143 df=2 n=24		
Intersectoral collaboration		
1=Very little need	0	7.7
2=Somewhat needed	9.1	0
3=Needed	27.3	76.9
4=Very much needed	63.6	15.4
Chi-square=8.43895 p=.0378 df=3 n=24		

Continued

Table 6 continued

<u>Ratings</u>	<u>Health Center(%)</u>	<u>Hospital(%)</u>
Primary health care concept		
1=Very little need	0.0	16.7
2=Somewhat needed	0.0	16.7
3=Needed	18.2	41.7
4=Very much needed	81.8	25.0
Chi-square=8.25785 p=.0410 df= 3 n=23		
Embroidery		
1=Very little need	9.1	25.0
2=Somewhat needed	18.2	8.3
3=Needed	27.3	66.7
4=Very much needed	45.5	0.0
Chi-square=8.57880 p=.0354 df=3 n=23		

Age. The ages of the respondents were divided into two groups; 20-35 years (younger) and 36-50 years (older) which constituted about half of the respondents in each group. The responses to the following topics were significantly related to age: planning nutrition surveys, program planning, modification of normal diet for calories, nutrition during pregnancy, experimental cookery, and personality assessment. The younger respondents expressed a greater need for these topics than did older respondents as shown in Table 7.

Table 7

Significant Relationships Between Respondents' Perceived
In-Service Training Needs and Their Age

Ratings	Younger(%)	Older(%)
Planning nutrition surveys		
1=Very little need	7.1	7.1
2=Somewhat needed	28.6	36.4
3=Needed	7.1	45.5
4=Very much needed	57.1	9.1
Chi-square=7.86436 p=.0489 df=3 n=25		
Nutrient content of food		
1=Very little need	7.7	18.1
2=Somewhat needed	0.0	9.1
3=Needed	0.0	45.5
4=Very much needed	92.3	27.3
Chi-square=11.64755 p=.0087 df=3 n=24		
Program planning		
1=Very little need	14.3	0.0
2=Somewhat needed	7.1	0.0
3=Needed	7.1	70.0
4=Very much needed	71.4	30.0
Chi-square=10.90543 p=.0122 df=3 n=24		
Modification of normal diet for calories and proteins		
1=Very little need	7.1	0.0
2=Somewhat needed	0.0	18.2
3=Needed	0.0	54.5
4=Very much needed	92.3	27.3
Chi-square=15.10755 p=.0017 df=3 n=25		

Continued

Table 7 continued

Ratings	Younger(%)	Older(%)
Nutrition during pregnancy		
1=Very little need	7.7	27.3
2=Somewhat needed	0.0	27.3
3=Needed	15.4	0.0
4=Very much needed	76.9	45.5
Chi-square=7.55245 p=.0562 df=3 n=24		
Experimental cookery		
1=Very little need	7.7	10.0
2=Somewhat needed	30.8	10.0
3=Needed	15.4	70.0
4=Very much needed	46.2	10.0
Chi-square=7.89217 p=.0483 df=3 n=23		
Personality assessment		
1=Very little need	0.0	9.1
2=Somewhat needed	33.3	0.0
3=Needed	25.0	72.7
4=Very much needed	41.7	18.2
Chi-square=8.53109 p=.0362 df=3 n=23		

Twelve community nutrition educators responded to the open ended section of the questionnaire. Most of the topics suggested were repetitions of what was in the questionnaire and others were not subject matter related. The following topics were suggested: first aid, home management, nutrition in aged people, balancing of diet, nutrition during convalescence, promotion of breastfeeding, growth monitoring, counselling as a profession, nutrition follow ups, day care centers for both children and mothers, how to deal with poor families with malnourished children, day care

centers and rehabilitation centers, hospital diets, personal hygiene, alcoholism and drug abuse, adolescence problems, project management, administration, family planning, recreation centers, and counselling as a profession.

The significant relationships identified by the chi-square analyses are summarized in Table 8. Responses to planning nutrition surveys were related to job title and age. Responses to socialization were related to job title and experience. Responses to modification of normal diet for calories and proteins and nutrient content of food were related to experience and age. All the other topics were independent of other demographic characteristics.

Table 8

Summary of Significant Relationships Between Respondents'
Perceived In-Service Training Needs and Selected
Demographic Characteristics

Item no.	Topic	Job title	Experi- ence	Work place	Age
9	Planning nutrition surveys	x			x
88	Nutrient content of food		x		x
68	Motivation	x			
69	Socialization	x	x		
71	Needs assessment techniques	x			
52	Modification of normal diet for calories and proteins		x		x
23	Management of personal and family resources			x	
39	Pest and disease control			x	
62	Role of social psychology			x	
85	Intersectoral collaboration			x	
86	Primary health care concept			x	
98	Embroidery			x	
11	Program planning				x
90	Nutrition during pregnancy				x
61	Experimental cookery				x
64	Personality assessment				x

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the in-service training needs of community nutrition educators in Kiambu District in Kenya for the delivery of nutrition education. In addition it was hoped that the findings from the study would be used by the nutrition department as a basis for organizing in-service training programs for community nutrition educators. The skills gained through such in-service training programs would help community nutrition educators to meet the changing needs of the communities that they serve.

Research Questions. The study sought answers to these two questions:

1. What are the in-service training needs in selected subject matter training areas as perceived by the community nutrition educators?
2. What are the relationships between selected demographic characteristics and the community nutrition educators' perceptions regarding in-service training needs?

Procedure. The study was conducted in Kiambu District, Kenya in February 1991. A questionnaire developed for the study was administered to, and completed by 25 community nutrition educators who were working in Kiambu District at that time. The respondents included 17 Nutrition Field

Workers and 8 Community Nutrition Technicians. There were 11 respondents working in health centers and 13 working in hospitals. The majority of the respondents (12) had attained the Kenya Certificate of Education. The number of years on the job ranged from 1 to 26 years. Respondents' ages ranged from 20 to 50 years.

The data were collected to determine the perceived in-service training needs of community nutrition educators on 15 selected subject matter areas: nutrition surveillance, family health, family resource management, environmental health, food science and technology, family food production, hospital kitchen management, therapeutic diets, diet modification, food laboratory practice, social psychology, communication, community nutrition, food and nutrition, and handicrafts. These areas were divided into sub-topics. The respondents were asked to rate on a four-point Likert scale how much in-service training they thought was needed in each of the sub-topics. The completed questionnaires were received from Kenya in March 1991.

The data were analyzed using frequency distributions, percentages, mean scores, and chi-square. Question one dealt with identifying the perceived in-service training needs of selected subject matter areas, while question two dealt with determining whether there were any significant relationships between job title, experience, age, and work place and the respondents' perceptions regarding in-service training needs. Twenty-five percent

(25%) of the topics that received the highest mean scores were considered to be the most important topics for in-service training programs.

The following topics in nutrition surveillance were perceived by the respondents as important items for in-service training: groups at nutritional risk, assessment of nutritional status, and types of nutrition surveys.

In the area of family health, the following topics were perceived as important for in-service training by the respondents: prenatal health, normal growth and development, caring for the premature, child spacing, childhood diseases, and diarrheal diseases.

In the area of environmental health, the following topics were perceived as important by the respondents: water supply, food hygiene, and communicable diseases.

In food science and technology, the following topics were perceived as important topics for in-service training by the respondents: analysis of food, and toxins in food.

Food purchasing in hospital kitchens and safety in the kitchen were the topics with the highest mean scores in the area of hospital kitchen management.

In the area of therapeutic diets, importance of diet counselling was perceived as an important topic.

In the area of diet modification the following topics were perceived as important: modification of normal diet for calories and proteins, dietary modification in gastrointestinal tract disturbances, dietary modification

for metabolic and nervous disorders, dietary modification for cardiovascular and renal disorders, and dietary modification in children's disorders.

In the area of social psychology, motivation and socialization were perceived as important topics.

Communication process, guidance and counselling and facilitation and teaching approaches were all perceived as important topics.

Conclusions

Based on the findings, the greatest need for in-service training are in the areas of family health and diet modification. It can be concluded that these are the priority areas for in-service training programs.

The chi-square analysis revealed that the following topics had a relationship with the respondents' perceptions regarding in-service training needs: planning nutrition surveys, motivation, socialization, and needs assessment techniques. The Community Nutrition Technicians expressed a greater need for in-service training in these topics than did Nutrition Field Workers. The higher need expressed in these topics may be due to the inexperience of the Community Nutrition Technicians or to inadequacy in the preparation in these areas during the pre-service training.

Modification of normal diet for calories and proteins, nutrient content in food, motivation, and socialization were perceived by the less experienced (1-8 years) respondents perceived as more needed than did more experienced

respondents (9 or more years). Perhaps this difference can be attributed to lack of enough experience in these topics or exposure to these topics which leads to the need to have more understanding of these topics.

Younger respondents (20-35 years) expressed a greater need for in-service training than did older respondents (36-50 years) in the following topics: planning nutrition surveys, program planning, nutrition during pregnancy, nutrient content of food, experimental cookery, modification of normal diet for calories and proteins, and personality assessment. These differences too could be attributed to lack of experience on the part of younger community nutrition educators.

Finally, the chi-square analysis which used the work place as the determining variable revealed that health center based respondents expressed a greater perceived need for in-service training in the following topics than did hospital based respondents: management of personal and family resources, pest and disease control, role of social psychology, inter-sectoral collaboration, primary health care concept, and embroidery. These differences may be attributed to changes in health needs, specific needs in the communities that lead to the need to have better understanding of these topics in order to help the community, or to inadequacies in the curriculum in covering these topics.

Based on the overall findings of this study, these conclusions were made:

1. The community nutrition educators expressed the greatest need for in-service training for topics in family health and diet modification.
2. Although there were a few significant relationships identified between community nutrition educators' perceived needs and the selected demographic characteristics, most of these were not in the top 25% of the topics perceived to be most needed overall.
3. There was unity overall in expressed needs for in-service training in the top 25% of topics perceived to be most needed.
4. The respondents were willing to participate in the study, as indicated by the 100% return of instrument.
4. The instrument designed for this study was effective in measuring the intended outcome which was to gain an understanding of the in-service training needs of community nutrition educators in Kiambu District.

Recommendations

The findings and conclusions in this study led to the following recommendations:

1. In-service training programs should be planned for the community nutrition educators. The areas

of family health and diet modification should be given the highest priority. Other areas for which should be given priority are topics in nutrition surveillance, environmental health, and food science and technology.

2. The in-service training programs should take into consideration the differences identified by the respondents and develop training programs that meet the specific training needs of each group.
3. There should be a review of the current curriculum that prepares Community Nutrition Technicians so that it can be updated to include training which is relevant to the needs of the communities served by the Community Nutrition Technicians.
4. A survey should be carried out to determine the needs of the communities regarding nutrition education which can be met by the Nutrition Field Workers and Community Nutrition Technicians. Such findings would help program developers to set goals and objectives for training programs to meet the identified needs of the communities served.
5. A study should be carried out to evaluate the effectiveness of the current nutrition education program as it is implemented in the communities of Kiambu District. The findings would help in designing appropriate programs to meet the changing needs of the communities served.

6. Future studies should be carried out to determine the needs of other community nutrition educators in other districts in the country.

BIBLIOGRAPHY

- Bishop, L. J. (1976). Staff development and instructional improvement. Boston: Allyn and Bacon.
- Borg, W. R. (1983). Educational research. New York: Longman Inc.
- Brahee, D. R. (1989). An analysis of perceived in-service training needs of county extension agents. Unpublished doctoral dissertation, Colorado State University.
- Boyle, Patrick G. (1981). Planning better programs. New York: McGraw-Hill Book Company.
- Bwibo, N. O., & Lore, W. (1988). Health and services. In Kenya: An official handbook. Nairobi: Ministry of Information and Broadcasting.
- Carlson, B. A., & Wardlaw, T. M. (1990). A global, regional and country assessment of child malnutrition. New York: UNICEF.
- Central Bureau of Statistics. (1984). Situation analysis of women and children in Kenya. Some determinants of well being. Nairobi: UNICEF.
- Courtney, W. E. (1988). A guide to empirical research in education. Corvallis, OR: Sanderling Press.
- Courtney, W. E. (1990). Scaling. Corvallis, OR: Sanderling Press.
- Goldstein, I. L. (1974). Training: Program development and evaluation. California: Brooks/Cole Publishing Company.
- Harris, B. M. & Bessent, W. (1969). In-service education: A guide to better practice. Englewood Cliffs, NJ: Prentice-Hall Inc.
- Havelock, R. G., & Havelock, M. C. (1973). Training for Change Agents. Ann Arbor, MI: Institute for social Research, The University of Michigan.
- Holly, M. L., & Blackman C. (1981). Building a conceptual framework for professional development. Action in Teacher Education, 3(1) 1-10.

- Jansen, A. A. J., & Horelli, H. T., & Quin V. J. (1987). Food and Nutrition in Kenya: A Historical Review. University of Nairobi: Department of Community Health.
- Jelliffe, Derrick B. (1969). Child nutrition in developing countries: A handbook for field workers. Washington DC: Agency for International Development.
- Jelliffe, D. B. & Jelliffe, P. E. F. (1984). Nutritional improvement and primary health care delivery system. Food and Nutrition. 10(1) 53-63.
- Jones, E. V., & Lowe J. (1990). Changing teacher behavior: effective staff development. Adult Learning, 1(7) 8-10.
- Karen College. (n.d.). Curriculum for Community Nutrition Technicians. Nairobi.
- Kerlinger, F. N. (1986). Foundations of behavioral research. Orlando: Holt, Rinehart, and Winston, Inc.
- Knowles, M. S. (1970). The modern practice of adult education: andragogy Vs pedagogy. New York: Association Press.
- Kowalski, T. J. (1988). The organization and planning of adult education. Albany, NY: State University of New York Press.
- Long, D. H. (1977). Competency-Based Staff Development. In C. W Beegle, & R. A. Edelfelt (Eds.), Staff development: Staff liberation. University of Virginia, Association for Supervision and Curriculum Development, School of Education.
- Maalof, W. D., & Contado, T. C. (1983). Basic in-service training for agricultural extension. Training for Agriculture and Rural Development, 31, 39-47.
- Nowlen, P. M. (1980). Program origins. In B. Knox (Ed.), Developing, administering and evaluating adult education. San Francisco: Jossey-Bass Publishers.
- Nturibi, D. N. (1982). Training of community development agents for popular participation. Community Development Journal, 17(2) 106-119.
- Ongondo, W. N. (1985). The professional competencies needed by immediate agricultural extension personnel in Kenya agricultural service. Unpublished doctoral dissertation, Pennsylvania State University.

- Paige, R. C. (1985). An analysis of self-perceived in-service training needs of Mississippi extension home economists. Unpublished doctoral dissertation, Mississippi State University.
- Pratt, A., & Pratt, B. (1987). A model for communicating nutrition information in Sub-Saharan Africa. Journal of Nutrition Education, 19(2), 55-59.
- Sabry, Z. I. (1982). An international perspective: Issues in the evaluation of nutrition interventions. Food and Nutrition, 8(2) 3-8.
- Smith, M. F., & Woeste, J. T. (1983). In-service education: Does it make a difference? Journal of Extension, xx.
- Stroether, G. B., (1982). Administration of continuing education. Belmont, CA: Wadsworth, Inc.
- Stufflebeam, D. N., & McCormick, C. H., & Brikerhoff, R. O., & Nelson, C. O. (1985). Conducting Educational Needs Assessment. Hingham, MA: Kluwer Academic Publishing.
- Swap, S.M. (1987). Managing an effective in-service program. New York: Teachers College, Columbia University.
- Szczykowski, R. (1980). Objectives and activities. In B. Knox, (Ed), Development, administration and evaluation of adult education. San Francisco: Jossey-Bass Inc.
- Tumuti, D. W. (1987). In-service training needs of home economics agents in Nyeri (Kenya) as perceived by technical officers, technical assistants, and junior technical assistants. Unpublished doctoral dissertation, Southern Illinois University at Carbondale.
- United Nations Development Program. (1990). Human Development Report 1990. New York: Oxford University Press.
- UNICEF. (1989a). A UNICEF Policy Review: Strategies for children in the 1990's. New York.
- UNICEF. (1989b). The State of the World's Children. New York: Oxford University Press.
- Wood, F. H., & Thompson, S. R. (1980). Guidelines for better staff development. Educational Leadership, 37 (5), 374-378.

World Bank (1975). Kenya into the second decade: Report of mission sent to Kenya by the World Bank. The John Hopkins University Press.

World Health Organization (1987). Evaluation of the strategy for health for all by the year 2000. Seventh report on the world health situation. Vol. 2, Africa Region, 141-143.

APPENDICES

APPENDIX A

COVER LETTER TO THE COMMUNITY NUTRITION EDUCATORS

DEPARTMENT OF HUMAN DEVELOPMENT
AND FAMILY SCIENCES



OREGON STATE UNIVERSITY
Milam Hall 322 · Corvallis, Oregon 97331-5102 USA
Telephone 503-737-4765

December 15, 1990

Dear NFW/CNT:


I am writing to you in connection with a research study I am conducting to determine the in-service training needs for NFWs and CNTs in Kenya.


I am convinced that you are in the best position to identify what you need to learn in relation to your job because you are aware of the difficulties you face in the process of performing your duties. The information gathered in this study will be used to make recommendations for in-service training for you as a Nutrition Field Worker or Community Nutrition Technician.

Your genuine cooperation in providing all the information in the enclosed questionnaire is not only appreciated, but is vital to the success of research project. Please do not write your name on the questionnaire. All the information you provide will be treated in great confidence.

I take this opportunity to thank you for your cooperation and for participating in this study, and to wish you all the best in your work.

Sincerely,


Lucy Miring'u
Graduate Student
Department of Human Development
and Family Sciences


Catherine R. Mumaw, Ph.D., C.H.E
Associate Professor
Department of Human Development
and Family Sciences

APPENDIX B
QUESTIONNAIRE USED FOR THE STUDY

**A SURVEY OF INSERVICE TRAINING NEEDS OF NUTRITION
FIELD WORKERS (NFWs) AND COMMUNITY NUTRITION
TECHNICIANS (CNTs) IN KIAMBU DISTRICT, KENYA**

Respondent Information

Please indicate (circle or complete):

1. Your job title: NFW or CNT
2. Your work place: Health Center or Hospital
3. Division: Kiambaa, Kikuyu, Githunguri, Gatundu, Thika, Lari, Limuru
4. Highest level of education completed: CPE, KJSE, O-level, A-level
5. Year of completion of training in nutrition: _____
6. Number of years in this job: _____
7. Your age: _____ 20-25 _____ 31-35 _____ 41-45 _____ 51-55
 _____ 26-30 _____ 36-40 _____ 46-50

Instructions for Completing the Questionnaire

- A. This questionnaire contains selected subject matter areas related to community nutrition education in Kenya. You are being asked to indicate your opinion on how much inservice training you think is needed in the selected areas related to your job.
- B. Do not take too much time in thinking about any particular item. Please do not leave any item unanswered. There are no right or wrong answers. Your opinion on how much inservice training you think is needed in each area is the primary concern.
- C. For each item please circle the rating (1,2,3,4) which most closely represents your opinion. If your exact opinion is not one of the choices, pick the one which comes closest to your opinion.

Inservice Training Needed in Selected Subject Matter Areas Related to Community Nutrition Educators in Kenya

Please indicate how much inservice training you think is needed in the following areas by circling the number you think is most appropriate. Here is an example:

How much inservice training is needed in the area of:

1. Personal cleanliness and grooming

Very little need
 Somewhat needed
 Needed
 Very much needed

① 2 3 4

This person, in circling "1", thinks that this item has very little need for inservice training. Please continue with the questionnaire.

How much inservice training is needed in the area of:

A. Nutrition Surveillance

	<i>Very little need</i>		<i>Somewhat needed</i>	<i>Needed</i>	<i>Very much needed</i>
1. Factors affecting food supply	1	2	3	4	
2. Dietary survey methods	1	2	3	4	
3. Groups at nutritional risk	1	2	3	4	
4. Factors contributing to chronic malnutrition	1	2	3	4	
5. Assessment of nutritional status	1	2	3	4	
6. Data collection	1	2	3	4	
7. Record keeping and monitoring	1	2	3	4	
8. Types of nutrition surveys	1	2	3	4	
9. Planning nutrition surveys	1	2	3	4	
10. Use of statistics in checking and analyzing data	1	2	3	4	
11. Program planning	1	2	3	4	

B. Family Health

12. Pre-natal health	1	2	3	4
13. Normal growth and development	1	2	3	4
14. Care of the newborn	1	2	3	4
15. Caring for the premarure	1	2	3	4
16. Child spacing	1	2	3	4
17. Immunization	1	2	3	4
18. Childhood diseases	1	2	3	4
19. Diarrheal diseases	1	2	3	4

C. Family Resource Management

20. Nature of family resource management	1	2	3	4
21. Identifying family goals and values	1	2	3	4
22. Identifying personal, family, and community resources	1	2	3	4
23. Management of personal and family resources	1	2	3	4

(Please continue to the next page)

How much inservice training is needed in the area of:

D. Environmental Health

	Very little need	Somewhat needed	Needed	Very much needed
24. Water supply	1	2	3	4
25. Food hygiene	1	2	3	4
26. Food quality control	1	2	3	4
27. Communicable diseases	1	2	3	4
28. Housing	1	2	3	4
29. Waste disposal	1	2	3	4

E. Food Science and Technology

30. Analysis of food	1	2	3	4
31. Methods of sampling	1	2	3	4
32. Food composition	1	2	3	4
33. Chemical properties of food	1	2	3	4
34. Toxins in food	1	2	3	4
35. Food processing and preservation	1	2	3	4
36. Food additives and fortification	1	2	3	4

F. Family Food Production

37. Planning a kitchen garden	1	2	3	4
38. Selecting crops for the kitchen garden	1	2	3	4
39. Pest and disease control	1	2	3	4
40. Fertilizer and manure application	1	2	3	4
41. Food preservation and storage	1	2	3	4
42. Selection and management of livestock	1	2	3	4

G. Hospital Kitchen Management

43. Safety measures in the kitchen	1	2	3	4
44. Food purchasing in hospital kitchens	1	2	3	4
45. Food service in hospital kitchens	1	2	3	4
46. Meal planning	1	2	3	4

(Please continue to the next page)

How much inservice training is needed in the area of:

H. Therapeutic Diets

	Very little need	Somewhat needed	Needed	Very much needed
47. Importance of diet counseling	1	2	3	4
48. Patient's life situation and food habits	1	2	3	4
49. Formulation of dietary history	1	2	3	4
50. Assessment of nutritional needs	1	2	3	4

I. Diet Modification

51. Reasons for diet modification	1	2	3	4
52. Modification of normal diet for calories and proteins	1	2	3	4
53. Dietary modification in gastrointestinal tract disturbances	1	2	3	4
54. Dietary modification for surgical conditions	1	2	3	4
55. Dietary modification for metabolic and nervous disorders	1	2	3	4
56. Dietary modification for cardiovascular and renal disorders	1	2	3	4
57. Dietary modification in children's disorders	1	2	3	4
58. Diet in anaemia	1	2	3	4

J. Food Laboratory Practice

59. Methods of cooking	1	2	3	4
60. Effects of food preparation and cooking on nutrients	1	2	3	4
61. Experimental cookery	1	2	3	4

(Please continue to the next page)

How much inservice training is needed in the area of:

K. Social Psychology

	Very little need	Somewhat needed	Needed	Very much needed
62. Role of social psychology	1	2	3	4
63. Interpersonal relationships	1	2	3	4
64. Personality assessment	1	2	3	4
65. Group interactions	1	2	3	4
66. Cultural values and practices	1	2	3	4
67. Attitude change	1	2	3	4
68. Motivation	1	2	3	4
69. Socialization	1	2	3	4

L. Communication

70. Communication process	1	2	3	4
71. Needs assessment techniques	1	2	3	4
72. Planning and problem solving	1	2	3	4
73. Leadership strategies	1	2	3	4
74. How adults learn	1	2	3	4
75. Motivation and learning theories	1	2	3	4
76. Guidance and counseling techniques	1	2	3	4
77. Selection and use of teaching aids	1	2	3	4
78. Facilitation and teaching approaches	1	2	3	4
79. Micro-teaching and evaluation	1	2	3	4

M. Community Nutrition

80. Food taboos and their effects	1	2	3	4
81. Eating habits	1	2	3	4
82. Causes and effects of malnutrition	1	2	3	4
83. Deficiency diseases prevention and cure	1	2	3	4
84. Effects of excess nutrients in the body	1	2	3	4
85. Intersectoral collaboration	1	2	3	4
86. Primary health care concept	1	2	3	4

(Please continue to the next page)

How much inservice training is needed in the area of:

N. Food and Nutrition

	Very little need	Somewhat needed	Needed	Very much needed
87. Functions of nutrients in the body	1	2	3	4
88. Nutrient content of food	1	2	3	4
89. Planning balanced diets from locally produced foodstuffs	1	2	3	4
90. Nutrition during pregnancy	1	2	3	4
91. Nutrition requirements during lactation	1	2	3	4
92. Nutrition in infancy	1	2	3	4
93. Weaning diets	1	2	3	4
94. Nutrition in adolescence	1	2	3	4

O. Handicrafts

95. Selecting and purchasing family clothing	1	2	3	4
96. Garment design and construction	1	2	3	4
97. Pattern drafting	1	2	3	4
98. Embroidery	1	2	3	4
99. Knitting	1	2	3	4

P. Other

List any additional areas that you think are needed, but which have not been included in the questionnaire, also indicate to what extent they are needed:

1. _____	1	2	3	4
2. _____	1	2	3	4
3. _____	1	2	3	4
4. _____	1	2	3	4
5. _____	1	2	3	4

APPENDIX C
KAREN COLLEGE CURRICULUM

KAREN COLLEGE CURRICULUM FOR COMMUNITY NUTRITION TECHNICIANS

1. Nutrition

- 1 Basic nutrition
- 2 Nutrient content of food
- 3 Purpose of food processing
- 4 Nutrition and vulnerable groups
- 5 Community nutrition

2. Communication

- 1 Getting acquainted and climate and standard setting
- 2 Needs assessment
- 3 Working with others
- 4 Planning and problem solving
- 5 Leadership strategies
- 6 Communication process
- 7 Psychology of adult learning
- 8 Motivation in learning and learning theories
- 9 Facilitation and teaching approaches
- 10 Guidance and counselling
- 11 Selection and use of teaching/learning aids
- 12 Micro teaching and evaluation

3. Social psychology

- 1 Introduction to social psychology
- 2 Social perception
- 3 Interpersonal relationships
- 4 Personality assessment
- 5 Interaction with people
- 6 Cultural values and norms
- 7 Attitude change
- 8 Power, leadership and influence
- 9 Interaction in groups
- 10 Motivation
- 11 Socialization

4. Anatomy and physiology

- 1 Structure of the body
- 2 Skeletal framework
- 3 Muscles
- 4 Blood vessels
- 5 Nerves
- 6 Organs
- 7 Nervous system
- 8 Endocrine system
- 9 Digestive system
- 10 Metabolism
- 11 Cardiovascular system
- 12 Respiratory system
- 13 Excretory system
- 14 Reproductive system

5. Hospital diets

- 1 Hospital kitchen diets
- 2 Introduction to therapeutic diet modification
- 3 Nutrition interview
- 4 The normal diet
- 5 Modification of normal diet for calories and proteins
- 6 Modification of normal diet in disturbances of the gastro intestinal tract
- 7 Dietary modification for surgical conditions
- 8 Dietary modification for metabolic and nervous disorders
- 9 Dietary modification for cardiovascular and renal disorders
- 10 Diet modification in children's disorders
- 11 Diet modification in miscellaneous disorders

6. Food laboratory practice

- 1 Introduction to cookery
- 2 Methods of cooking
- 3 Effects of food preparation and cooking on nutrients
- 4 Meal planning
- 5 Meal service
- 6 Experimental cookery

7. Food science and technology

- 1 Introduction
- 2 Analysis of food
- 3 Fats and oils
- 4 Carbohydrates
- 5 Protein
- 6 Meat and meat products
- 7 Vegetables and fruits
- 8 Milk and milk products
- 9 Cereals and their use
- 10 Toxins in food
- 11 Food processing and preservation
- 12 Food additives and fortification
- 13 Quality food control

8. Family food production

- 1 Food crops
- 2 Animal products
- 3 Use of farmers training centers
- 4 Practical

9. Family health
 - 1 Pre-natal health
 - 2 Normal growth and development
 - 3 The new born
 - 4 Prematurity
 - 5 Child spacing
 - 6 Immunization
 - 7 General infections peculiar to children
 - 8 Diarrheal diseases
10. Family resource management
 - 1 Introduction
 - 2 Routine work in the house
11. Handicrafts
 - 1 Equipment
 - 2 Pattern drafting
 - 3 Types of patterns
 - 4 The color wheel
 - 5 Embroidery
 - 6 Knitting
 - 7 Practical (Making an article)
 - 8 Steps in tie and dyeing
12. Environmental health
 - 1 Housing
 - 2 Water supply
 - 3 Food hygiene
 - 4 Food quality control
 - 5 Communicable diseases
13. Nutrition surveillance
 - 1 General introduction
 - 2 Factors influencing the supply and utilization of food
 - 3 Dietary surveys
 - 4 Groups of people at nutritional risk in the community
 - 5 Environmental factors
 - 6 The assessment of nutritional status
 - 7 Outline of work to be done during the two months practical
 - 8 Types of nutrition surveys
 - 9 Planning nutrition surveys
 - 10 The use of statistics in checking and analyzing data

- *14. Administration and management
 - 1 Outline of the structure and functions of health services
 - 2 Health personnel
 - 3 Role of community nutrition technicians
 - 4 The functions of hospitals, dispensaries, and referral system
 - 5 Outline of government structure
 - 6 Record maintenance
 - 7 Management techniques
 - 8 Definition of management
 - 9 Management process
- *15. Other related topics
 - 1 Child welfare programs
 - 2 School feeding program
 - 3 Existing supplementary feeding programs
 - 4 Project development and management
 - 5 District planning
 - 6 National nutrition policy
 - 7 Educational trips
- *16. Practical experience
 - 1 Maternal and child health/Family planning clinics
 - 2 Community
 - 3 Hospital kitchens
 - 4 Hospital wards
 - 5 Nutrition rehabilitation centers/ Family life

*Note: Area not included in questionnaire

APPENDIX D
MEAN SCORES AND STANDARD DEVIATIONS

Mean Scores and Standard Deviations for All Topics
(n=25)

	Mean	SD
<u>NUTRITION SURVEILLANCE</u>		
1. Factors affecting food supply	3.240	.663
2. Dietary survey methods	3.200	.866
3. Groups at nutritional risk	*3.520	.653
4. Factors contributing to malnutrition	3.333	1.007
5. Assessment of nutritional status	*3.440	.768
6. Data collection	3.240	.970
7. Record keeping and monitoring	3.160	.746
8. Types of nutrition surveys	*3.417	.881
9. Planning nutrition surveys	2.880	1.013
10. Use of statistics in analyzing data	3.333	.598
11. Program planning	3.333	.917
<u>FAMILY HEALTH</u>		
12. Pre-natal health	*3.400	.770
13. Normal growth and development	*3.520	.823
14. Care of the new born	3.200	1.118
15. Caring for the premature	*3.520	.918
16. Child spacing	*3.360	.995
17. Immunization	3.120	1.301
18. Childhood diseases	*3.360	.952
19. Diarrheal diseases	*3.440	.870
<u>FAMILY RESOURCE MANAGEMENT</u>		
20. Nature of family resource management	3.160	.688
21. Identifying family goals and values	3.320	.852
22. Identifying personal, family and community resources	3.125	.900
23. Management of personal and family resources	3.250	.847

Rating scale: 4=Very much needed 3=Needed
 2=Somewhat needed 1=Very little needed

Note: *Topics in the top 25%

	Mean	SD
<u>ENVIRONMENTAL HEALTH</u>		
24. Water supply	*3.360	.810
25. Food hygiene	*3.440	.917
26. Food quality control	3.240	1.012
27. Communicable diseases	*3.473	.593
28. Housing	2.750	.944
29. Waste disposal	3.043	.825
<u>FOOD SCIENCE AND TECHNOLOGY</u>		
30. Analysis of food	*3.360	.810
31. Methods of sampling	3.000	.816
32. Food composition	3.280	.792
33. Chemical properties of food	3.200	.957
34. Toxins in food	*3.708	.690
35. Food processing and preservation	*3.375	.970
36. Food additives and fortification	3.250	.944
<u>FAMILY FOOD PRODUCTION</u>		
37. Planning a kitchen garden	3.000	1.041
38. Selecting crops for the kitchen garden	2.840	.898
39. Pest and disease control	2.920	.997
40. Fertilizer and manure application	2.800	1.118
41. Food preservation and storage	3.333	.917
42. Selection and management of livestock	2.857	1.014
<u>HOSPITAL KITCHEN MANAGEMENT</u>		
43. Safety measures in the kitchen	3.360	1.036
44. Food purchasing in hospital kitchens	*3.400	.913
45. Food service in hospital kitchens	3.318	.995
46. Meal planning	3.250	1.073
<u>THERAPEUTIC DIETS</u>		
47. Importance of diet counselling	*3.440	.712
48. Patient's life situation and food habits	3.292	.999
49. Formulation of dietary history	3.160	.898
50. Assessment of nutritional needs	3.292	.908

Mean SD

DIET MODIFICATION

51. Reasons for diet modification	3.080	.997
52. Modification of normal diet for calories and proteins	*3.455	.823
53. Dietary modification in gastro intestinal tract disturbances	*3.480	.872
54. Dietary modification for surgical conditions	*3.375	.875
55. Dietary modification for metabolic and nervous disorders	*3.680	.690
56. Dietary modification for cardiovascular and renal disorders	*3.600	.764
57. Dietary modification in children's disorders	*3.520	.918
58. Diet in anaemia	3.250	.989

FOOD LABORATORY PRACTICE

59. Methods of cooking	3.208	1.062
60. Effects of food preparation and cooking on nutrients	3.286	.963
61. Experimental cookery	2.913	.949

SOCIAL PSYCHOLOGY

62. Role of social psychology	3.333	.637
63. Interpersonal relationships	3.000	.659
64. Personality assessment	3.043	.825
65. Group interactions	3.000	.885
66. Cultural values and practices	3.208	.932
67. Attitude change	3.250	.897
68. Motivation	*3.364	.790
69. Socialization	*3.391	.783

COMMUNICATION

70. Communication process	*3.435	.948
71. Needs assessment techniques	3.273	.703
72. Planning and problem solving	3.261	1.010
73. Leadership strategy	3.125	.797
74. How adults learn	3.250	.847
75. Motivation and learning theory	3.125	.900
76. Guidance and counselling techniques	*3.391	.783
77. Selection and use of teaching aids	3.174	.937
78. Facilitation and teaching approaches	*3.435	.590
79. Micro-teaching and evaluation	3.318	.780

Mean SD

COMMUNITY NUTRITION

80.	Food taboos and their effects	3.083	1.100
81.	Eating habits	3.000	1.216
82.	Causes and effects of malnutrition	3.167	1.049
83.	Deficiency diseases prevention and cure	3.333	.917
84.	Effects of excess nutrients in the body	3.333	.702
85.	Intersectoral collaboration	3.250	.737
86.	Primary health care concept	3.261	.964

FOOD AND NUTRITION

87.	Functions of nutrients in the body	3.208	1.021
88.	Nutrient content of food	3.333	1.049
89.	Planning balanced diets from locally produced foodstuffs	3.125	1.076
90.	Nutrition during pregnancy	3.167	1.204
91.	Nutrition requirements during lactation	3.250	1.113
92.	Nutrition in infancy	3.333	1.090
93.	Weaning diets	3.333	1.129
94.	Nutrition in adolescence	3.042	1.197

HANDICRAFTS

95.	Selecting and purchasing family clothing	2.833	1.007
96.	Garment design and construction	2.583	.881
97.	Pattern drafting	3.000	.706
98.	Embroidery	2.739	1.010
99.	Knitting	2.783	.850
