Study of Dietary Service in Three Selected Hospitals

By

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Introduction

I INTRODUCTION

"Let thy food be thy medicine"

(Hippocrates (460-370 BC)

With the rapid development of Dietetics as a separate discipline hospital dietary service has gained great momentum and has become an integral part of "Health Care" of hospitalised patients. Application of the science of foods and nutrition to alleviate problems of diseases has developed considerably giving rise to new special areas of interest which has facilitated well organised hospital dietary service (Study Commission on Dietetics Report, 1964).

Concern for the incorporation of nutrition in medical education is not really new. Even in the fourth century B.C., Hippocrates strongly urged dietary treatment for the prevention and cure of disease (Young, 1963). Florence Nightingale took the first initiative step toward restoring dietetics to its rightful place as a part of medical treatment when she fed the sick and wounded soldiers in the crimean war.

In all the developed countries dietary departments have become a "must" in hospital administration. Such a trend is coming into vogue with the existing infrastructure in developing nations like India.

Hospital food services during the last 50 years have changed quite a bit in type of food service, the use of special kitchen for special diet preparation, advent of frozen foods and their use in the menus, and the greater control in all areas of operation applying the scientific principles of organisation and management facilities for food service have also been offered to staff and employees. As West et al (1977) rightly points, today, hospitals comprise a large group of institutions whose food services are so important as to merit special consideration. With the major objective of improving the health of patients, restoring them to normal activity.

The aim of food service in hospitals as Sinha (1982) and ADA (1983) aptly point out, is to provide well balanced, sufficient, palatable food at right time at reasonable price for in-patients, their relatives and staff. Nutritional advice and education to patients is another important activity of this service.

The responsibilities of dietary department as per Downey (1983) include nutrition care of inpatients and outpatients in terms of preventive, maintenance and therapeutic aspects including counselling of patients and systematic follow-up action.

In hospital dietary service, dietitian play a very important role with the leadership of medical professionals and nurses.

A dietitian must be responsible as ADA (1983) points out for the assessment of nutrition status and food practices and when nutrition intervention is indicated for a patient the development of the nutrition care plan, provision of nutrition counselling, evaluation and documentation of the nutrition care plan in the patient's medical record, and provision of follow-up care and referrals as appropriate.

Each patient requires individual attention about his diet, his food preference and his nutrient requirements have to be carefully considered (Pasricha, (1983) and Lawson et al (1983).

In India, hospital dietary service needs reinforcement. Despite the report of the subcommittee

of National Nutrition Advisory Committee in 1973, on the situation of hospital dietary service, more information is needed in this aspect to plan improvement programmes for hospital food service. Developing countries like India need to go a long way in establishing effective hospital dietary service as Turnlund and Tanneus (1983) point out.

Keeping in view of the above factors the present research study was planned and conducted in selected three hospitals with the following objectives.

1. To understand the organisation set up and functioning of the dietary departments in the Government and private hospitals,
2. To evaluate the adequacy of diets served in the hospitals, and
3. To determine the extent of diet counselling given in the hospitals.

Review of Literature

II REVIEW OF LITERATURE

The review of literature pertaining to the study of Dietary service in selected hospitals is discussed under the following heads.

A. Organisational set up of Dietary Departments
B. Present position of Hospital Diets, Service and Evaluation.
C. Sanitation and Hygiene in Hospital Food Service
D. Diet Counselling of Patients

A. Organisational set up of Dietary Departments

Organisation is defined as "a system having an established structure and conscious planning in which people work and deal with one another in a coordinated and co-operative manner for the accomplishment of recognised goals" (Beach, 1975).

Koontz et al (1974) and Haimann (1974) stated that "management is the function of getting things done through people and directing the efforts of individuals towards a common objective".

Two types of authority relationships most often found in food service systems are line and line and staff relationship.

Organisation chart is used as a means of explaining and clarifying organisation structure and it presents graphically the basic groupings and relationships of positions and functions (West, et al, 1977).

The location of kitchen should be on the ground floor due to easy approach compactness in a work centre reduces travel and saves time and motion. Adequate ventilation should be provided. All parts of the premises used for food preparation should be adequately lit. The amount and type of equipment purchased based on many factors like menu pattern, size of the institution.

B. Present Position of Hospital Diets, Service and Evaluation

According to Sinha (1982) work related to preparation and distribution of food to the patient and other areas such as patient cafeteria/staff cafeteria comes under Food service which includes

1. Selection and purchase of food in a close working relationship with the material manager.
2. Receipts, storage and accounting of the items in all its forms.

3. Preparation and distribution of food according to the menu planned.

4. General cleanliness

Hospital Food Services often produce and serve more than 200 different menu item daily to meet the needs of patients, cafeteria and catering services (Matthews, 1982).

The conventional food service involves the following steps; procurement, preparation, heating, hot holding, portioning and service. Hospital Food Service also involves the additional step of assembly and distribution before food is actually served to the patients (Snyder et al, 1983).

Menu Planning

Skillful menu planning is the basis for the successful operation of a hospital dietary department and it is essentially a linear programming problem and that mathematical formulation is a rational approach. The menu planner needs scientific knowledge of good nutrition and management, plus the imagination to visualise interesting and attractive combination of food. Once the menu has been decided upon, the dietitian, orders the supplies,

co-ordinating the orders received from the sub-departments, (Montag et al, 1971; Hansen, 1977; Turnlund et al, 1983; and Philip, 1983).

The object of menu planning is to serve Quality Foods to patients, Quality Food are the Food which has been selected, prepared and served in such a manner as to retain or enhance natural flaver and identity; to conserve nutrients; and to be acceptable, attractive and microbiologically and chemically safe (ADA, 1974). Such diets are planned by a qualified dietitian who ensures their nutritional adequacy and so helps to restore the patient to full health as quickly as possible (West et al, 1977).

2. Purchasing

Purchasing in the food service industry is a highly specialised field (Mayfield, 1984). A good buyer never stops learning and as costs increases, he must continually evaluate purchasing systems and seek optimal methods to reduce costs (Ketchevar, 1975).

To purchase wisely, there are two main considerations. First consideration is to purchase everything needed in order to produce what is specified by the menu and the second consideration in purchasing in relation to budget limitations with cost (Pietrzyk et al, 1973).

Good purchasing procedure include correct specification of items and appropriate buying method, a systematic ordering schedule and maintenance of an adequate flow of goods to meet production requirement (West et al, 1977 and Sinha, 1982).

3. Receiving

Goods on receipt must be checked in terms of weight or number of commodity received; the quantity of the commodity to confirm the quality and root out spoilage of goods and finally the price as entered in the bill. The personnel had be trustworthy and trained to handle these commodities carefully and be alert in avoiding pilferage (Keiner and Kalli, 1974 and Fassler, 1982).

Receipt of supplies according to supply order is very important (Sinha, 1982). After checking all items send the bill to the Steward for disposal, and bring to the notice of the Dean/Superintendent any deterioration from vermin, damp or any other cause (Tamil Nadu Medical Code, 1977).

4. Method of Storing and issuing

The proper storage of food immediately after it has been received and checked is an important factor

in the prevention and control of loss, waste and theft within the operation (West et al, 1977 and Fassler, 1982).

The food materials must be stored in an orderly manner and in logical section (Ross, 1972). The two types of storage mentioned by Kotschevar and Terrel, (1977) includes

a) Dry, ventilated storage, where staple food supplies, fresh fruits and vegetables, cleaning supplies and equipment, linen, paper, bakers supplies are stored.

b) Refrigerated and low temperature storage, where all perishable items like dairy products meat, fish, poultry, fruits and vegetables frozen foods are stored.

Items are issued as per laid down policy, demand placed in consolidated form a day in advance and number of beds. Some items like sugar, milk, tea leaves can be issued on a pre-arranged scale everyday (Sinha, 1982).

The articles either require cooking or not. In the former case, articles are sent to the kitchen and in the latter case articles go to the wards directly, upon the requisitions made on the store-keeper by the steward on various forms according to his requirement (Tamil Nadu Medical Code, 1977).

5. Records

Records are as significant in the dietary department as they are in other business. They are source of important information for management control (Sinha, 1982).

6. Food Preparation

The Preliminary preparation of food involves peeling, washing, soaking, cutting and sorting of foods before being sent to the cook's unit. The aim and objects of different methods of cooking, such as boiling, poaching, baking, frying, steaming and grilling are to conserve the nutritive value of food, improve the digestibility, makes food more attractive in appearance and therefore more appetizing and free it from injurious organisms and substances (West et al 1977 and Philip, 1983).

7. Method of Food Service

In hospitals, the service of the food onto the trays may be centralised or decentralised, centralized service means serving the individual portions of food onto the trays that have been assembled and set up it some central point in or close to the kitchen. All trays are prepared under common supervision are then distributed by carts to patients floors from there, they are carried to the patient's bedside.

Decentralised service means the transportation of bulk quantities of food in heated or refrigerated trucks to serving pantries located throughout the building. Trays for the patients are set up in these serving pantries (Sub Committee Report, 1973 and West et al 1977). At each floor the dietary staff member distributes trays to individual patients. Dietary carts remain on the patient floor until after meal time. They are then filled with empty trays and soiled dishes and utensils and returned by the lift to a dishwashing area adjoining the food service department. Here the trays, dishes and stainless dietary carts are washed, and sanitized before they are moved to the food production section for using during the next meal (ADA, 1974).

Role of Diet in Disease

As early as the 5th century B.C., Hippocrates mentioned nutrition, as an integral part of therapy for many human illness (ADA, 1984). Throughout the ages, food has been associated with health, and diet has been implicated in the cause, cure and prevention of disease. The subject of diet therapy or treatment of disease by diet has become rational in recent years that it has outstripped its parent the science of nutrition (Bennell, 1974 and Guptha, 1977).

Dietary and nutritional factors have been strongly implicated in many diseases (Harkeck, 1976). Mainly due to ignorance of the fact that excess in food intake is as dangerous as too little. It results in many serious disease like heart attack, High Blood Pressure etc. along with obesity (Anjula et al, 1983).

1. Nutritional Adequacy

The special nutritional needs arising from metabolic disorder, chronic disease, injuries, prematurity and many other conditions require therapeutic treatment, not covered by Recommended Dietary Allowance for healthy persons, Nutritional adequacy of the diet can only be determined by ongoing assessment of nutrient intake and nutritional status (Grills and Rossaher, 1981).

Menus are planned and followed to meet nutritional needs of patients in accordance with physicians orders and to the extent medically possible in accordance with the Recommended Dietary Allowance (Smith, 1974).

Dietetics is based on a knowledge of Food Composition. Table of Food values are essential to the dietitianfor calculation and evaluation of the adequacy of diets (Todhunter, 1973).

Nutritional assessment is too frequently overlooked in acute care settings. As a result hospitalised patients do develop serious nutritional deficiency (Salmond, 1980).

2. Different Type of Hospital Diets

Therapeutic diets may be classified as qualitative and quantitative, modification of normal diet. The adjustment in diet may take by change in consistency, increase or decrease in energy value of diet; type of foods; omission of specific foods; adjustments in the ratio and balance of food constituents and rearrangement of the number and frequency of meals (Krause and Mahan, 1979).

Therapeutic diets are prescribed by the attending physicians and therapeutic menus must be planned in writing and prepared and served as order with either supervision or consultation from dietitian and advice from the physician whenever necessary (Smith, 1974).

The results of the nation wide study on the current status of Dietary Services provided in the Hospitals by NIN (1980) stated that depending on the need of the patient a wide variety of diets such as full diet, half diet, milk diet, milk and bread diet, high protein diet, diabetic diet and soft diets were supplied on

prescription of the attending physician or surgeon. Nutrient content of these diets was satisfactory and appeared to meet the requirements of different type of patients. But, various types of therapeutic diets supplied seemed to lack uniformity.

a. <u>General, Adequate or Normal Diet</u>

A normal diet should be such that its nutrients are sufficient to meet the needs of the individual in his particular stage of life. A modified diet is a diet based on the normal diet and designed to meet the requirements of a given situation. It may be modified in individual nutrients, caloric value, consistency, flavor, techniques of service or preparation, content of specific foods or a combination of these factors (ADA Clinical Handbook, 1981).

Full diet is a normal diet which is modified from the balanced diet recommended by ICMR. It provides all the nutrients in slightly higher amounts than recommended for a healthy male sedentary worker. It can be used for an adult patient (male or female) admitted in Hospital, who does not need any dietary modification. This is also known as General or Regular Diet (Pasricha,1983).

b. Liquid Diets

Liquid diets are of two kinds - the full liquid and the clear liquid. The full liquid diet consisting of foods that are liquid or liquefy at room temperature. The diet contains food that are easy to eat and digest and it provides 1800-2000 K.Cal. and 80 g. protein per day. The clear liquid diet has been defined as one which supplies clear fluids but is of little nutritional benefit and usually used for very brief periods of time, when it is necessary to minimize the amount of fecal matter in Colon (Turner, 1970; Rosenbaum, 1978; ADA Clinical Handbook, 1981).

c. Tube Feedings

Tube feedings are used either to maintain adequate nutritional status or as a treatment for malnutrition conditions in which oral intake is contraindicated. Tube feedings are liquids or blenderized diets designed to provide essential nutrients in a form that will easily pass through a tube (ADA Clinical Hand Book, 1981 and Nancy et al, 1983).

The nasogastric tube feeding used in most Hospitals consisted of pureed foods, milk, juice. Only few Hospitals provided tube feedings that were designed to

provide nutrients sufficient to meet the dietary standard (Ishkanian et al, 1983).

d. Soft diet and Low Fiber diet

A diet that contains a minimum of fiber and connective tissue is called a fiber restricted diet (Trowell, 1974). The soft diet is used as a transition diet and prepared for condition in which mechanical ease in eating, digestion or both is desired and it provides 1800-2000 K.Cal. (Krause and Mahan, 1979).

Milk and Bread diet is a soft diet which provides all nutrients except calories, iron and thiamine in the amount required for an adult man (Pasricha, 1983).

e. Bland diet

A bland diet is a diet which is non-irritating chemically, and mechanically and which inhibits gastric secretion and it can be used for gastric and duodenal ulcer patients after acute symptoms have subsided. This can be used for heart burn and indigestion. With slight changes and reduction in fiber and fat content, it can also be used for diarrhoea and ulcerative colitis (Rosenbaum, 1978 and Pasricha, 1983).

f. Diabetic diet and Low Calorie Diet

This diabetic diet is as close to the normal diet as possible, so as to meet the nutritional needs and treatment of individual patients. The low calorie diet provides less calories than the total energy requirements for the day, thus it provides the depletion of body fat. It is used in cases of obesity, cardiac disturbance, and hypertension in over weight individuals (Pasricha, 1983).

g. Low Sodium diet

This is a normal diet but with a low sodium content. The food preparation for this diet are cooked without extra salt and high sodium foods are avoided. This is designed for use in conditions where there is sodium retention like oedema, renal disease like nephritis, cardiac diseases, hyper tension and toxaemia of pregnancy (Newland, 1980 and Pasricha, 1983).

h. Renal diets

A Renal diet is a diet; in which the dietary intake of sodium, potassium and protein are carefully regulated from day to day. The level of each restriction

ordered is not static, but is dependent upon the patients clinical and biochemical status at any particular time (ADA Clinical Hand Book, 1981).

The purpose of renal diet is to achieve and maintain nutritional status, to lighten work of a diseased kidney and to replace nutrient losses due to impaired renal function and dialysis. Protein intake in chronic renal failure should be adjusted to avoid induction in uremic toxicity on the one hand and malnutrition on the other. Patients undergoing hemodialysis thrice weekly should receive atleast 1.0 g protein per kg. of body weight per day, with additional 0.2 g./kg./day of protein or essential amino acid also be recommended (Burton, 1974; Kopple 1978 and Bluemenkrants et al, 1978).

i. Fat controlled diet

Low fat is a normal diet modified to reduce the fat content to approximately 20 g. per day (Pasricha, 1983). Cholesterol and fat restricted diet is a diet in which both the amount and type of fat are limited to a prescribed level, or one that is designed to provide a certain percentage or ratios of

fatty acids (Zukel., 1969 and Turner, 1970). Fat controlled diets developed by American Heart Association provide a maximum of 300 mg. of cholesterol daily, 35% of kilocalories in the form of fat, a maximum of 10% of the kilocalories in the form of saturated fats and 10% of kilocalories in the form of polyunsaturated fats (ADA Clinical Hand Book, 1981).

C. Sanitation and Hygiene in Hospital Food Service

Sanitation was a very serious problem in nearly all hospitals (Hassan, 1977) "Sanitation is a way of life. It is the quality of living that is expressed in the clean home, the clean farm, the clean business and industry, the clean neighbourhood the clean community. Being a way of life, it must come from within the people, it is nourished by knowledge and grows as an obligation and an ideal in human relations". (National Sanitation Foundation Standard-R, 1973). No matter how nutritious or palatable foods may be, a lack of basic sanitation in their storage, preparation, serving or handling may cause illness, transmission of infection or even death. Only healthy persons should be permitted to participate in food service operation (Stauffer, 1971 and ADA report, 1983).

"On the basis of our experience, good sanitation results can be obtained through setting of high standards, rigid scheduling of assignments constant training, control of cleaning supplies" (Drake, 1972). Proper ventilation, flooring, drainage garbage disposal, use of correct type of disinfectant is a very essential to maintain proper hygiene in kitchen area (Sinha, 1982).

Many hospitals in Middle East, even the Food Service Supervisor had no understanding of the importance of adequate sanitation resulting in lack of hot water supply, flies in the kitchen, open garbage container, use of same area for meat, vegetable preparation and dirty facilities, physical examinations were not always routine. The General appearance and clothing of many kitchen workers were often dirty (Turnlund et al, 1983).

The results of the field investigation report of NIH (1980) showed that seventy four percent of the hospitals, provided regular medical check-up of the kitchen staff and this report also stated the fact that even though the kitchen staff was provided with uniform, its maintenance and upkeep was far from satisfactory.

Attention should be paid to facilities for the reasonable comfort of employees, clean, light locker rooms, space to change clothing, sufficient toilet and wash bowls should be provided (Northop, 1972).

D. Diet Counselling of Patients

Dietary counselling is the process whereby people are helped to deal with their dietary and nutritional problems. The goal of diet counselling is to bring about a desirable change in food behaviour (Robinson et al, 1982). Most of the patients, who call on the dietitian in clinics are those who have shown definite dietary abnormalities and have been largely suffering from physical diseases requiring diet therapy (Kuppuswami, 1973).

According to McManners et al (1984) patient counselling needs -

1. Understanding of diet rationale.
2. Understanding of food selection principles.
3. Ability to plan menus.
4. Knowledge of food purchasing and diet preparation.
5. Knowledge of how to follow diet away from home.
6. Knowledge of nutrition and food information resources available in the community.

The assessment of patient compliance with a prescribed diet is difficult but important aspect of nutritional counselling and the clinical investigation of new dietary regimens (Ney et al,1983).

The varied customs, food habits, dietary preferences and cost of conventional food materials pose a dilemma in prescribing the proper diete therapy and well experienced dietitian provide the right answer. The hospital authorities should take the initiative in establishing nutrition therapy centres, where even outdoor patient could be referred to for proper guidance (Ross, 1977).

Experimental Procedure

III EXPERIMENTAL PROCEDURE

To study the dietary service of selected hospitals following steps formed part of the experimental procedure.

A. Selection of Hospital Dietary Departments

B. Tools used in Conducting the Survey

C. Conducting the Survey

D. Analysis and Interpretation of the Data

A. Selection of Hospitals Dietary Departments

To study the present position of Hospital diets, three Hospitals were selected based on the criteria of easy accessibility and the facility of conducting an indepth study.

Of these three dietary departments, two were private Hospitals and one was a Government Hospital. The Government Hospital chosen was Rajaji Government Hospital, Madurai, which had a medical college attached. The private hospitals selected for the study were Christian Medical College and Hospital, Vellore and Apollo Hospitals, Madras, both having a well established dietary department.

B. Tools used in Conducting the Survey

1. Schedule
2. Check-list
3. Observation

1. Schedule

Schedule is the name usually applied to a set of questions which are asked and filled in by an interviewer who reads the question to respondent in a face to face situation (Bailey, 1982).

A schedule consisting of a set of questions and statements to be answered by the dietitian was prepared as shown in Appendix-I. This schedule was designed in a multiple choice and short answer format, so little writing was needed during the interview.

The schedule consisted of organisation and administrative aspects, menu planning, food purchasing, storage, food preparation, service methods, sanitation and hygiene of kitchen and food handlers, physical facilities available, quality of food and diet counselling given to patients.

2. Check-list

Check-list consist of a prepared list of items. It is a type of questionnaire in which questions are categorised for the respondent to check.

A check-list (Appendix-II) was also used to record the observation of food quality, kitchen facilities and sanitation.

3. Observation

Observation a scientific tool, is the most widely used procedure. Where, the observer appraises whatever happens as it happens (Bhatia, 1980 and Wilkinson et al,1982).

C. Conducting the Survey

In the present study, the investigator observed types of food service in the hospital dietary departments to get first hand information. The dietitians were interviewed and the necessary information was elicited with the help of prepared schedule in all the three hospital dietary departments. The investigator observed and understood the Hospital dietary service in terms of food purchasing, storage, food preparation and food service. The preparation of different diets at different stages were observed. The dietitian supervised the food preparation. The observation included Food Service Method, physical facilities available in the dietary kitchen, sanitation and hygiene of food handlers. The investigator followed the food trolleys in Government Hospital to check the mode of distribution and quantity of food in the wards. In the case of Private Hospitals, the investigator observed the tray setting, and the distribution of food to the wards by trolleys.

Various diets served in private hospitals and Government hospitals studied in detail, nutritive contribution of these diets worked out, which indicated the food and nutrient intake of each individual.

D. Analysis and Interpretation of the Data

The data was analysed to find the correlation between the nutritive value ordinary vegetarian and non-vegetarian diet provided in Government hospital and private hospitals with the National Advisory Committee recommendation.

Results and Discussion

IV RESULTS AND DISCUSSION

To study the Dietary service in three selected Hospitals, two private hospitals namely Christian Medical College and Hospital, Vellore - PH_1 and Apollo Hospitals, Madras PH_2 and Rajaji Government Hospital, Madras - GH were selected. The findings of the study were consolidated and presented under the following headings.

A. General information of the Hospital Dietary Departments.
B. Functioning of the Dietary Department
C. Type of Food Service in the Dietary Departments
D. Practices adopted in Sanitation and Food Hygiene
E. Pattern of diets served and their adequacy
F. Diet counselling to the patients

A. General Information of the Hospital Dietary Department

The dietary department in GH was started as early as 1910, 1954 in PH_1 and 1983 in PH_2. In all the three hospitals observed, dietary departments were well organised and directed by a professionally qualified

dietitian. In addition to this a separate Food and Beverage Department operated under the guidance of a qualified Food and Beverage Manager in PH_2.

1. Organisation Structure of the Hospital Dietary Department

A well defined organisation structure is imperative in any institution. This clearly defines authority responsibility relationships of the personnel in the institution. The type of organisation is determined by the nature and size of the institution. It may be either line or line and staff organisation.

Line organisation prevailed in the GH (Fig.1) and persons having greater decision making authority were placed at the top and those having the least decision making authority at the bottom.

Line and Staff organisation was followed in both the private hospitals (Fig.2 and Fig.3). Here the line authorities have direct control over their sub-ordinates. Staff authorities give expert advice to line manager at the same level.

Supervision is designated for all working hours in all the hospitals except in GH.

Table I presents the maximum and minimum mmber of patients catered/day over a 3 months period.

ORGANISATION CHART OF GH

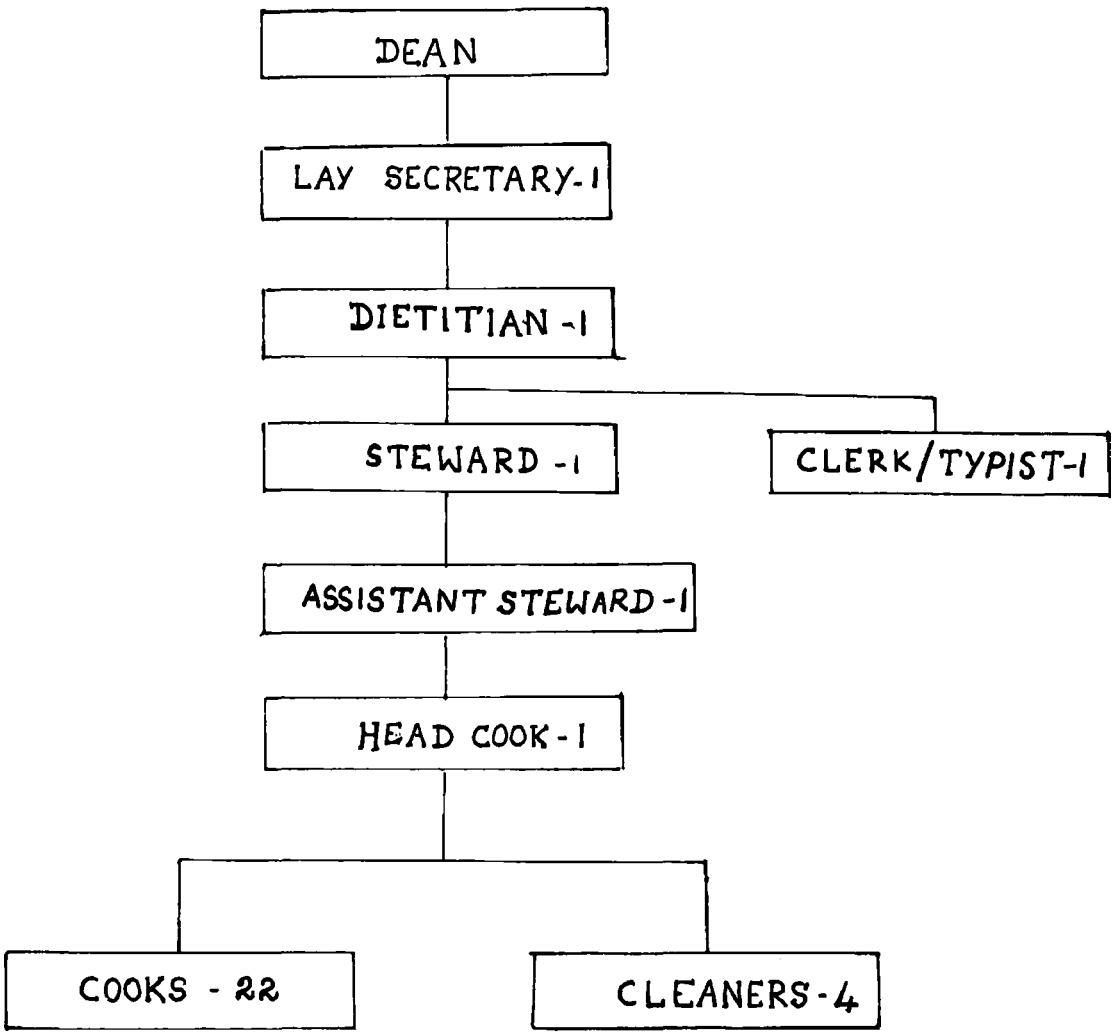


Figure - 1

ORGANISATION CHART OF PH.

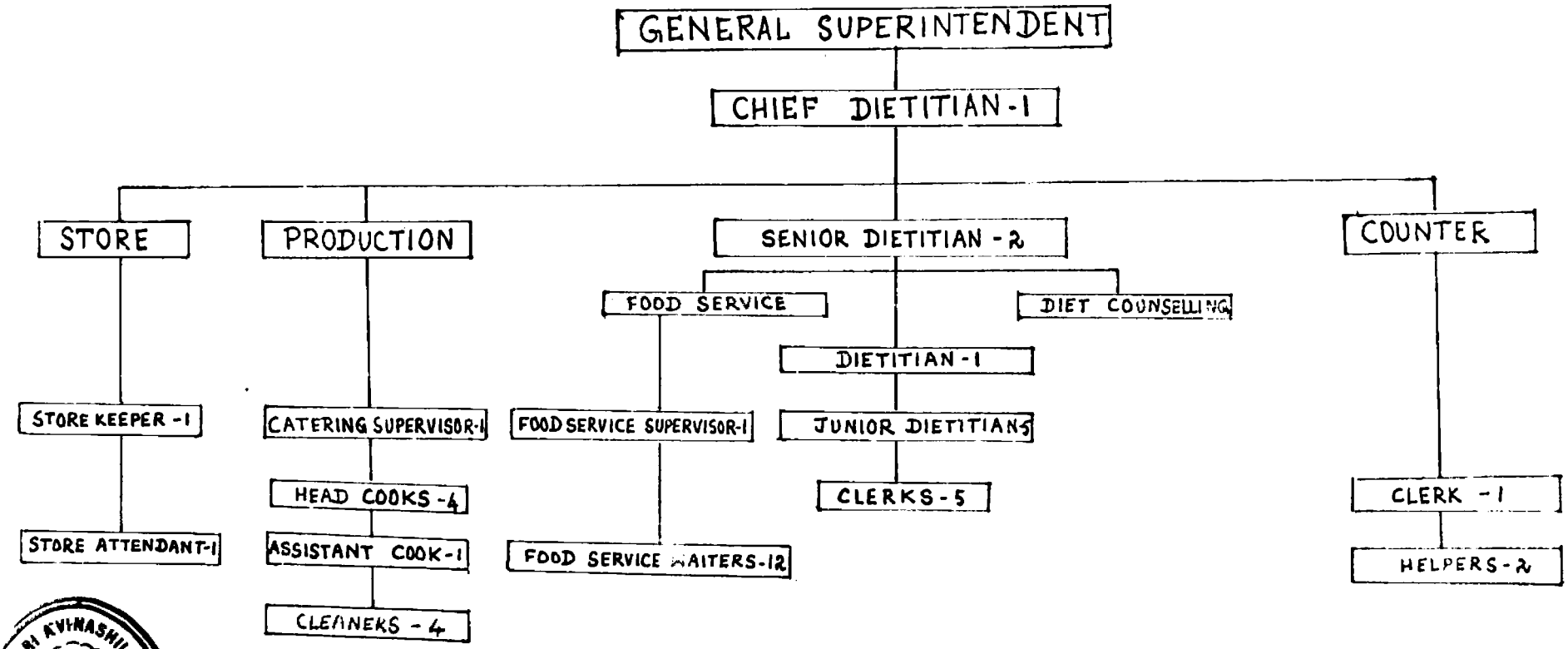


Figure - 2

ORGANISATION CHART OF PH2

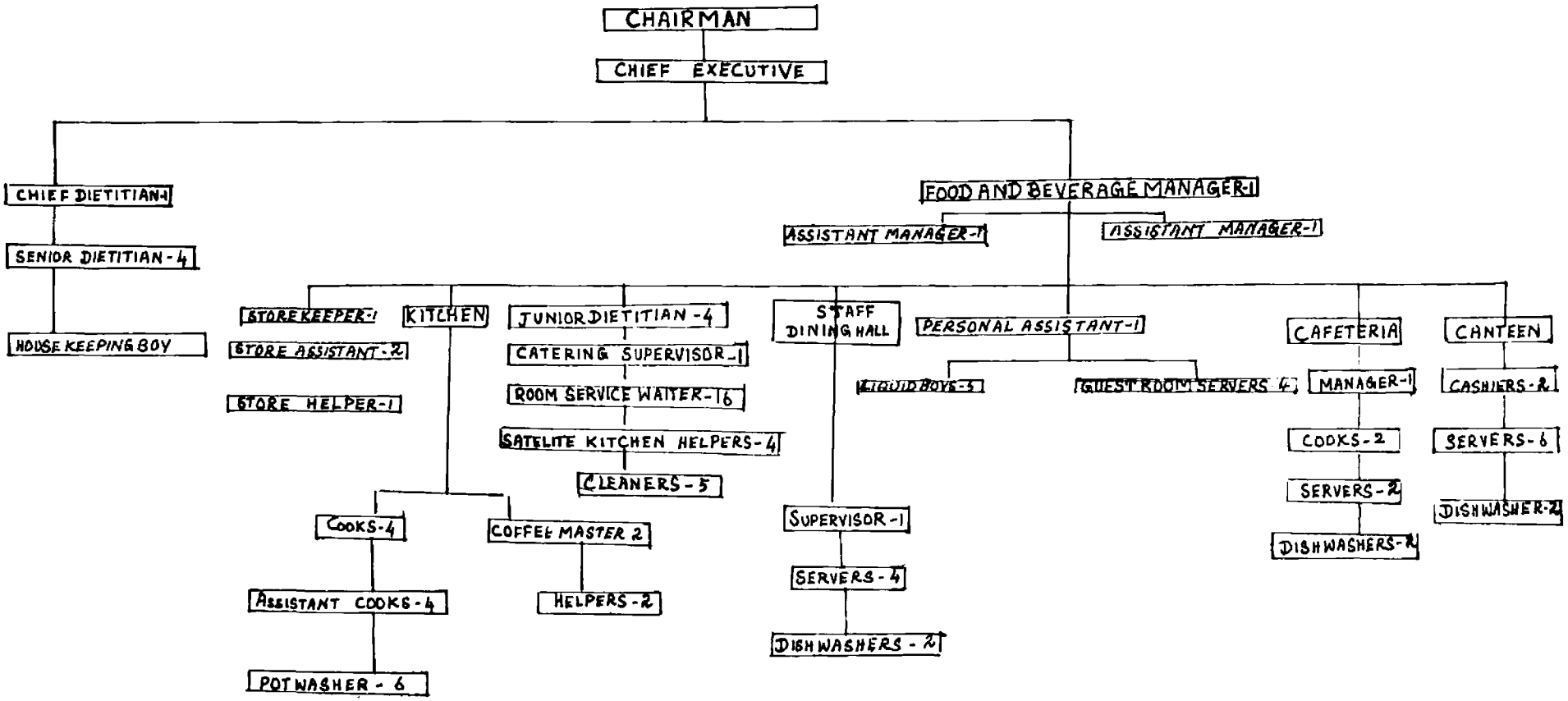


Figure-3

TABLE I

MAXIMUM AND MINIMUM NUMBER OF PATIENTS CATERED/DAY OVER A 3 MONTHS PERIOD

Number of patients	GH		PH_1	PH_2
	Standard diet *	Non-Standard diet **		
Maximum	363	1217	464	190
Minimum	336	1166	419	168
On date (24.1.85)	361	1175	464	174

* Full diet

** Less than Rs.2/-

As is evident from the table, the maximum number of standard diets and non standard diets served in GH were 363 and 1217 respectively as against minimum number of standard and non standard diets served were 336 and 1166 respectively. On the day of observation, the number of standard diets served was 361 and non-standard diets, 1175.

In PH_1, the maximum number of diets, minimum number of diets and the number served on the date of observation were 454, 419 and 444 respectively.

PH_2 recorded a service of 190 diets as its maximum, 162 as its minimum and 17% on the day of observation.

The dietary department in GH caters to the food needs of the patients. In-patients, out-patients and attendants avail the services of the dietary department in PH_1. Apart from the patients, out patients and the attendants PH_2 also serves food to visitors and V.I.P's. Counter service is offered for the outsiders in PH_1 and PH_2.

TABLE II

STAFF POSITION OF THE DIETARY DEPARTMENTS

	GH	PH_1	PH_2
Chief dietitian	1	1	1
Senior dietitian	-	2	4
Dietitian	-	1	-
Junior dietitian	-	6	4
Supervisor	-	2	2
Steward	1	-	-
Assistant Steward	1	-	-
Store-Keeper	-	1	1
Stores Attendant	-	1	2
Clerk/Typist	1	6	-
Head Cook	1	4	6
Cooks	22	-	-
Assistant Cook	-	1	14
Masalchi	-	4	2
Cleaners	4	2	17
Food Service Waiters	-	12	23
Others	-	-	4
Total	31	42	81

Table II shows that there is only one dietitian in GH who is designated as the chief dietitian. In PH_1, there is a chief dietitian, 2 senior dietitians, one dietitian and 6 junior dietitians. PH_2 has a chief dietitian, 4 senior dietitians and 4 junior dietitians. There are 2 supervisors in each private hospital (i.e.) one catering supervisor and a Food Service Supervisor. The posts of a steward and an assistant steward were only in GH. There is a Store-Keeper and an Attendant in PH_1 and a Store-Keeper and 3 Attendants in PH_2. One Clerk was employed in GH and 6 in PH_1.

The Head Cooks in GH, PH_1 and PH_2 numbered 1, 4 and 6 respectively. There were 22 Cooks in GH, who also performed the functions of Food Service Waiters. There was one Assistant Cook in PH_1 and 14 in PH_2. Separate Cooks for the preparation of Therapeutic Diets were not appointed in any of the three hospitals. 4 Cleaners in GH, 2 in PH_1 and 17 in PH_2 saw to the washing and cleaning of pots and pans. There were 12 Food Service Waiters and 23 in PH_1 and PH_2.

Apart from the above mentioned personnel the dietary department of PH_2 was also manned by a Food and Beverage Manager, assisted by 3 others.

The number of personnel present in PH_1 and PH_2 were found to be satisfactory.

Supervision of foods was done by the dietitian in GH, catering supervisor in PH_1 and Food and Beverage Manager in PH_2.

The Lay Secretary looked into the inspection of foods in GH, General Superintendent in PH_1 and dietitian in PH_2.

Collection of foods was the portfolio of the Cooks in GH, Clerk in PH_1 and Junior Dietitian in PH_2.

Food served for the patients was checked by the Junior Dietitian in both the private hospitals, for quantity.

8. Cost of meals

Meals were given at free of cost in GH.

The food given to patients in private hospitals was charged appropriately.

TABLE III

COST OF DIETS IN GOVERNMENT HOSPITAL

Type of diet	Permissible cost/head in Rs. P.
Standard diet	
Adult Indian Ordinary diet (Vegetarian and Non-Vegetarian)	4.80 - 4.92
Children Ordinary Diet	7.06 - 7.37
T.B. Diet for Adults	10.74
T.B. Diet for Children	4.80
Milk and Bread Diet	5.66
Thoracic Diet	9.26
Diabetic diet	8.81
Non-Standard diet	
General wards (Non Paying Patients)	2.00
'C' Class	1.80
'B' Class	3.00
'A' Class	4.00

Table (III) explained the permissible limit of cost for non-standard diets and cost of standard diets as per the quotation rates for the year (1984-85) in GH.

In PH_1, normal vegetarian diet costs Rs.11.50, normal non-vegetarian diet costs Rs.13.00 and Regular European Diet Rs.17.00 per day. Charges were made to the extra items.

Table IV clearly gives the selling price of full vegetarian/non-vegetarian and liquid diet for different wards in PH_2.

TABLE IV

COST OF DIETS PER DAY IN PH_2

Ward	Selling Price-Diets/Day in Rs.	
	Liquid Diet	Full Vegetarian/ Non-Vegetarian Diet
General	15.00	15.00
Semi Private	20.00	45.00
Deluxe	23.00	65.00
Super Deluxe	25.00	95.00

B. Functioning of the Dietary Department

1. Menu Planning

Standard Cycle Menu was used in all the three hospitals. But, PH_1 and PH_2 offered wide choice within the menu. Standardised recipes were used in all the hospitals. In GH_1 the menu was followed on the basis of rigid diet scale and no planning was done. Whereas in PH_1, menu planning was done by the dietitian in consultation with the cook and store-keeper. In PH_2, the dietitian asked Food and Beverage Manager and catering supervisor for formulating menu.

2. Mode of purchasing, storing and issuing items

Table V presents the purchasing procedure in the hospital dietary departments.

TABLE V

PURCHASING PROCEDURE IN HOSPITAL DIETARY DEPARTMENTS

Hospital Dietary Department	Person incharge of purchasing	Purchasing Procedure	Methods of Purchasing	Source of Supply	Method of Payment
GH	Head Steward	Issue indent tenders	Through contract	Co-operative Society Civil Supplies and Wholesalers	Cheque
PH_1	Chief dietitian and Store-Keeper	Placing Orders Issue indent	Through Contract by Telephone	Procedures, Wholesalers Co-operatives	beque
PH_2	Store-Keeper and Purchase Manager	Placing Orders	Through Contract, by telephone	Procedures Retailers	Cash and Cheque

In GH, Head Steward is incharge of stores, issued indent, call tenders under the supervision of Lay Secretary. Many of the items were purchased from Co-operative Super Markets, Civil Supplies and Aavin Milk Corporation. In PH_1 the chief dietitian in consultation with the Store-Keeper compared quotations for vegetables and placed the orders. Other perishable and staple food items were ordered by the Store-Keeper.

Purchase Manager and Store-Keeper placed the orders through contract, or telephone to the retailers, and producers in PH_2.

Accounts department paid the amount in the form of cheque in GH and PH_1. The payment was done either in the form of cash or cheque in PH_2.

With regard to frequency of purchase, it was found that all perishable items were purchased daily in all the three hospital dietary departments. Staple items were purchased daily in PH_2, fortnightly or monthly in PH_1 and monthly in GH.

The transport used for this purpose, were lorry, cart and bicycle in PH_1 and GH. In PH_2 items were brought manually.

The items were received and checked by Store-Keeper in private hospital dietary departments and by steward in GH. The items received were checked for both quantity and quality.

The provision for dry storage was found to be adequate in all the dietary departments. Cold storage was found in PH_1 and PH_2 and was inadequate in the latter.

Issuing was done by Store-Keeper in PH_1 and PH_2 and by steward in GH. Issuing of items from stores were based on strength of stores requisition in PH_2 and strength of the beds in GH and PH_1.

The left over materials were taken back to stores only in PH_1. Records were maintained in all the hospital dietary departments.

3. Food Preparation

TABLE VI

FOOD ITEMS PREPARED DAILY IN THE DIETARY KITCHEN

Meal	Hospital Dietary Departments		
	GH	PH_1	PH_2
Breakfast	Coffee, Idly, Sambar	Coffee, Idly/ Pongal/ Uppuma, toast, Omelette, Sambar	Coffee, Porridge, Toast, Idly, Uthappam/ Uppuma/ Pongal, Omelette Sambar Chutney
Lunch & Dinner	Rice, Curry Sambar Rasam, Mutton Curry	Rice, Vegetable Curry Sambar, Soup, dessert	Rice, Curry, Sambar, Soup, desserts
Tea	Coffee	Coffee, Sandwich Vadai/ Bajji/Bonda	Coffee, Sandwich Sweet/ Savoury preparation

In GH daily Idly, Sambar, Coffee, Rice, Vegetable porriyal, non-vegetarian curry, rasam were prepared.

In PH_1 and PH_2 wide variety of food items were prepared including hot and cold drinks, different kinds of egg preparation, rice, vegetable curry, non-vegetarian preparations, desert, toast, sandwich, Indian sweet and savoury preparations.

In GH and PH_2, the vegetables are received in time before cooking and they were cut just before cooking. In PH_1, the vegetables were cut previous day and stored properly.

The methods used for cooking in GH were boiling, steaming and frying. In PH_1 and PH_2 boiling, steaming, frying, baking, pressure cooking, roasting, grilling, boiling and steaming methods were used.

Rice was prepared by absorption method in PH_2 and straining method in PH_1 and GH. Dhal, vegetables, mutton and egg preparations were made by boiling method in GH and PH_2. Steaming was usually adopted in preparing different food items in PH_1. Frying is used for fish preparations in all the dietary kitchens. Either boiling or shallow fat frying was used to prepare egg items in PH_1 and PH_2. Probably nutrition education with regard to appropriate cooking methods conserving nutrients is required.

Types of fuel used in Hospital Kitchen

Firewood was the only source of fuel used in GH. Steam and Gas were used for majority of the preparations in PH_1 and PH_2 while electricity was occasionally used. Coal was used for preparing phulkas in PH_1.

C. Type of Food Service in the Dietary Departments

Centralised tray service was given to the patients in PH_1. Decentralised catering system was under operation in GH and PH_2. In PH_2, food was carried to the satelite kitchen in bulk and from there, set trays were distributed to patients. Heated trolleys were used to carry the food trays to the wards in PH_1 and PH_2 and each ward had its own pantry.

Bulk quantities of food were transported to wards where, staff nurse received and distributed foods, after measuring it to patients or patients attendants in GH.

1. Meal Serving Time

Table VII shows the meal serving time of the three hospital dietary departments.

TABLE VII

MEAL SERVING TIME

Meal	GH	PH_1	PH_2
Bed Coffee	5.30 - 6.30 a.m.	5.30 a.m.	6.00 a.m.
Breakfast	5.30 - 6.30 a.m.	7.30 a.m.	6.25-8.00 a.m.
Lunch	12.30-1.00 p.m.	12.30 p.m.	11.45-1.00 p.m.
Tea	3.30 - 4.30 p.m.	3.00 p.m.	3.45-4.30 p.m.
Dinner	3.30 - 4.30 p.m.	6.30 - 7.00 p.m.	6.00-7.30 p.m.

In GH, the bed coffee and breakfast were served between 5.30 - 6.30 A.M., the tea and dinner between 3.30 - 4.30 p.m. The timings seemed to be very inconvenient for the patients in Government Hospital.

In PH_1 and PH_2 all the meals were served at proper time and the patients were satisfied with their meal timing.

2. Quantity and Quality of Food Served to the Patients

It was observed that both the private hospitals served tasty and attractive meals at proper temperature. In GH, no importance was given to the taste, appearance and temperature of meals served to the patients.

From Appendix II it was observed that all the food items were tasty and palatable in PH_1 and PH_2. Except fruit, egg and milk which was distributed to the wards directly, none of the items were found satisfactory in the case of GH.

The patients were aware of the quantity of foods served to them in all the three hospitals. In PH_1 and PH_2 the patients checked the quantity by referring to the tray slip.

Plate waste seemed to be nil at all the hospital dietary departments. In case, if the patients felt that the food supplied to them was excess, immediately they reported to the concerned person, so necessary action was taken in PH_1 and PH_2 so absolutely plate waste was avoided.

D. Practices adopted in Sanitation and Food Hygiene

Sanitation of the dietary departments is a must, so that the patients are provided with wholesome meals. In private hospitals crockery and cutlery were very clean. The food handlers were also clean. Clean uniform, aprons and hairnuts were provided to the waiters.

Patients used their own plate and tumblers for receiving the food in GH, monitering the cleanliness of which was difficult. The cooks are not provided with uniforms, aprons and hairnuts. It was found that not much importance was given to the sanitation aspect.

1. Physical facilities

It was observed that, in all the three hospitals the allocation of space (Appendix II) was adequate. Modern labour saving equipment were installed in private hospitals to reduce labour cost and to make the work more easy. Proper work simplification methods were followed. Whereas in GH only one labour saving equipment (i.e.) wet grinder was used.

In PH_1 and PH_2, ventilation, lighting and washing area were adequate and satisfactory. GH was very poor in these aspects.

2. Personnel facilities

Shift system were in use in all the three hospital dietary departments, training for particular job was given to the workers in private hospital dietary departments. Employees canteen, restroom, locker facilities and toilet were present in PH_1 and PH_2. Only one rest room was present in GH.

With regard to health service employees were examined before their appointment and annual health check up was given to the dietary employees in PH_1 and PH_2.

B. Pattern of diets served and their adequacy

Different type of diets provided by the three hospital dietary departments were studied and their adequacy was compared with the sub committee recommendations (1973).

Details are presented in Table VIII.

TABLE VIII

DIFFERENT TYPE OF DIETS PROVIDED BY THE HOSPITAL DIETARY DEPARTMENTS

Name of the diets	Dietary Hospital Departments which serve the diets
Ordinary Diet (Vegetarian)	GH, PH_1, PH_2
Ordinary Diet (Non-Vegetarian)	GH, PH_1, PH_2
Diabetic Diet (Vegetarian)	GH, PH_1, PH_2
Diabetic Diet (Non-Vegetarian)	PH_1, PH_2
Paediatric Diet	GH, PH_1, PH_2
Liquid Diet	GH, PH_1, PH_2
Semi Solid Diet	PH_2
Soft Diet	GH, PH_1, PH_2
TB Diet or High Calorie Diet	GH, PH_1, PH_2
Renal Diet	PH_1
Salt Free Diet	PH_1, PH_2
Low Fat Diet	PH_1, PH_2
Tube Feeding	PH_1, PH_2

From the above Table VIII it was observed that ordinary diet (Vegetarian) have liquid diet, soft diet, T.B. or High calorie diet, paediatric diet, diabetic diet (Vegetarian) were provided in all the hospitals. Diabetic Diet (Non-Vegetarian) Salt free diet, Low fat diet, Tube feeding were provided in private hospitals. Semi solid diet was provided only in PH_2 and only in PH_1 Renal diet was provided.

Ordinary Diet

Composition of the ordinary diet in terms of the different food items as compared against RAC is presented in Table IX.

TABLE IX

COMPOSITION OF ORDINARY DIET AS COMPARED AGAINST PRESCRIPTION BY NAC

Foodstuffs in g.	Hospital		Dietary Departments				Nutritional Advisory Committee	
	GH		PH_1		PH_2			
	V	NV	V	NV	V	NV	V	NV
Cereals	360	360	250	250	250	250	350	350
Pulses	70	70	115	115	100	45	50	25
Leafy Vegetables	50	50	100	100	100	100	100	100
Roots and Tubers	100	-	120	120	120	120	100	100
Other Vegetables	100	100	200	200	200	200	200	200
Fruits	170	170	100	100	120	120	150	150
Milk	50	50	400	200	400	400	550	300
Curds	-	-	400	200	200	200		
* Butter Milk	250	250	-	-	-	-		
Fats and Oil	15	15	20	20	35	15	20	30
Meat and Fish	-	50	-	50	-	50	-	50
Eggs	-	50	-	50	-	50	-	50
Cane Sugar and Jaggery	20	20	20	20	20	20	50	50
Coconut fresh	-	-	10	10	-	-	-	-
Bread White	-	-	-	-	50	50	50	50

* Butter milk 250 ml. made from 100 ml. of curds

V - Vegetarian NV - Non-Vegetarian

The foodstuffs provided in private and Government hospitals were compared with their recommended amounts prescribed the Nutritional Advisory Committee ((1973).

The Table (IX) shows that the amount of cereals supplied to the patients in GH exceeded the allowance by 10 gms. The amount given in the private hospitals were found to be less. The amount of pulses included in the ordinary diets given in all the hospitals exceeded the recommended amount and it was as high as 100-115 g. in PH_1 and PH_2 against 50 g. prescribed by Nutritional Advisory Committee.

The intake of vegetables and fruits by the patients who are fed the ordinary diet was satisfactory except the GH both PH_1 and PH_2 met the requirements of milk and milk products as recommended by the Nutritional Advisory Committee (1973).

The requirement of meat, fish and eggs were adequately met.

As against the required amount of 50 gms. for sugar and jaggery, the intake of the same by the patients on ordinary diets in all the hospitals was found to be only 20 gms.

TABLE X

NUTRITIVE VALUE OF ORDINARY DIET

Nutrients	Hospital Dietary Department						Nutritional Advisory Committee	
	GH		PH_1		PH_2			
	V	NV	V	NV	V	NV	V	NV
Energy KCal.	1992	1970	2211	2195	2268	2242	2500	2500
Carbohydrate g	369	356	369	339	351	320	420	400
Protein (g.)	49	60	75	79	76	78	75	80
Fat (g.)	24	36	53	58	61	72	60	70
Fiber (g)	5	3.7	9.6	8.8	8	7.3	-	-
Iron (mg)	27	29	30	31	54	53	-	-
Vitamin A Carotene (µg.)	3604	746	874	1254	6443	6897	-	-
Vitamin C (mg)	198	131	180	176	340	340	-	-

V - Vegetarian NV - Non-Vegetarian

As is evident from Table (X), the energy requirements met by the ordinary diets given in PH_1 and PH_2, was found to be satisfactory. The ordinary diet prescribed in GH felt short of the actual requirements by 600 KCal. (Fig. 4 and 5).

The protein requirements of the ordinary diet in PH_1 and PH_2 were to the tune of 1.25 g./kg. body weight per day and in GH it was less than 1 g./kg. body weight per day.

With the exception of GH the fat content of the ordinary diets in PH_1 and PH_2 was within the required level.

There is no basis for comparison of fiber, iron, Vitamin A and vitamin C content of the ordinary diets as there is no standards established by the Nutritional Advisory Committee for the same.

Paediatric Diet

The Table XI shows with the exception of cereals, the requirement of pulses, vegetables, fruits, milk and milk products and fats and oils were quantitatively adequate.

NUTRITIVE VALUE OF ORDINARY VEGETARIAN DIET

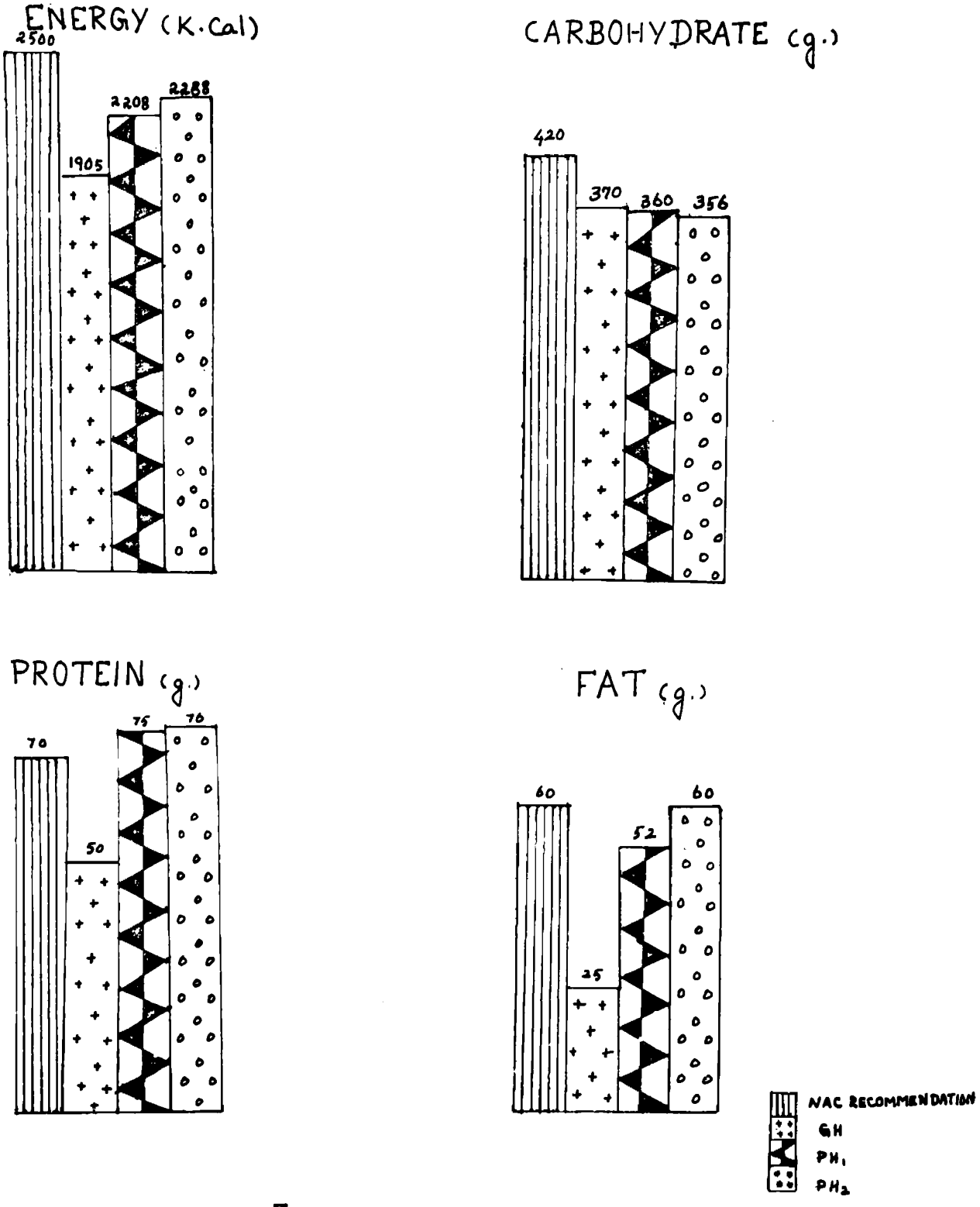


Figure . 4

NUTRITIVE VALUE OF ORDINARY NON-VEGETARIAN DIET

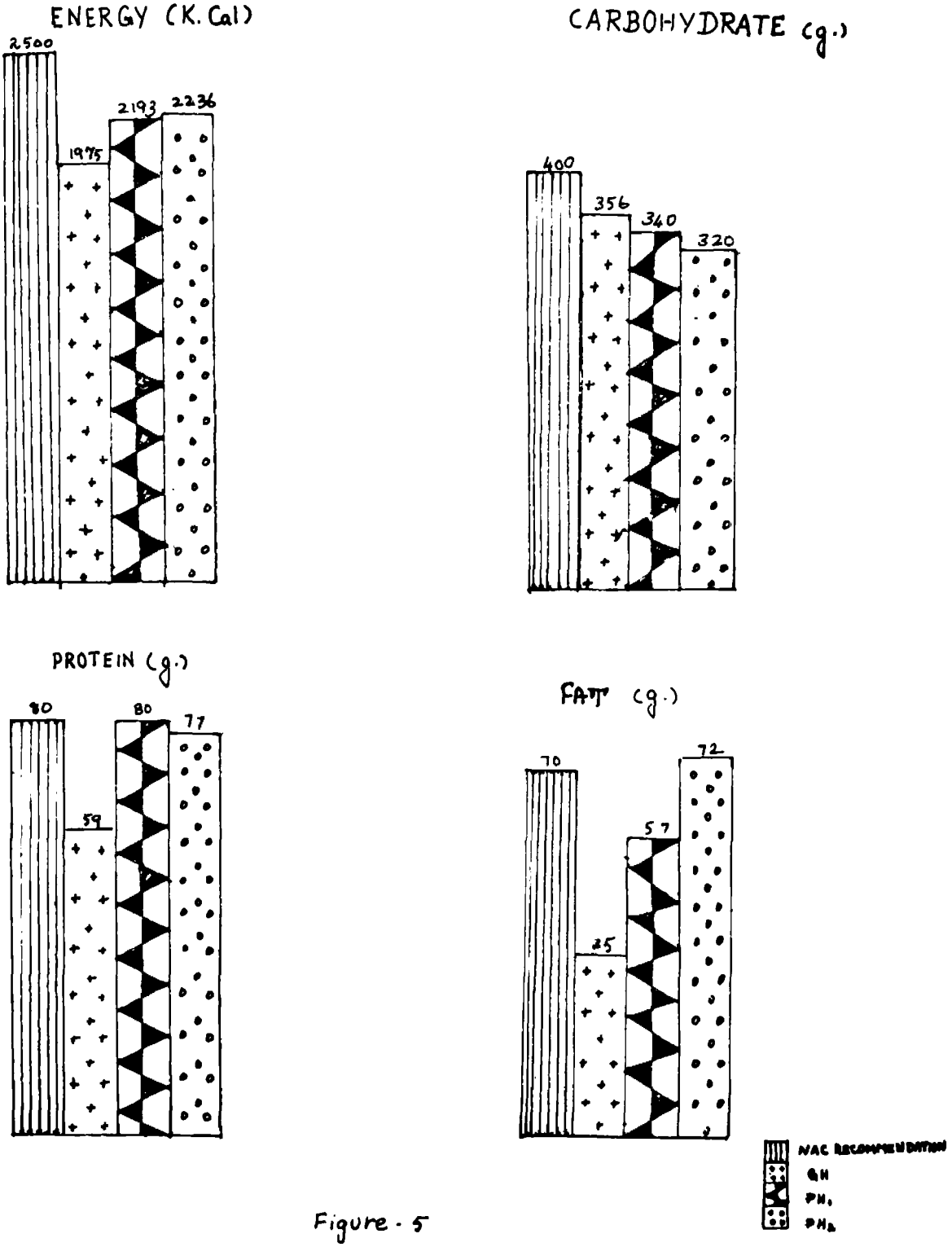


Figure - 5

TABLE XI

COMPOSITION OF PAEDIATRIC DIET AS COMPARED AGAINST PRESCRIPTION BY NAC

(Non-Vegetarian)

Food Stuff in (g.)	Hospital Dietary Departments			Nutritional Advisory Committee
	GH	PH_1	PH_2	
Cereals	200	100	125	250
Pulses	-	30	30	25
Leafy Vegetables	50	50	50	75
Roots and Tubers	-	50	50	50
Other Vegetables	50	100	100	75
Fruit	220	175	125	150
Milk	750	600	400	450
Curds	-	200	200	
Butter Milk	125	-	-	
Butter, Fat and Oil	25	20	20	20
Meat and Fish	50	50	50	100
Eggs	50	50	50	100
Cane Sugar and Jaggery	50	20	20	50
Coconut Fresh	20	-	-	-
Bread White	100	50	50	100

Only half the requirement for meat, fish and eggs were met by the ordinary children diets in the hospital dietary departments under study. The nutritive value is presented in the following table.

TABLE XII

NUTRITIVE VALUE OF PAEDIATRIC DIET

(Non-Vegetarian)

Nutrients	Hospital Dietary Departments			Nutritional Advisory Committee
	GH	PH_1	PH_2	
Energy K.Cal.	2200	1706	1728	2000
CHO (g)	323	219	239	300
Protein (g)	64	65	70	75
Fat (g.)	73	64	55	55
Fibre (g.)	3	6	4	-
Iron (mg.)	8	25	25	-
Vitamin A (Carotene μg.)	1306	2840	1366	-
Vitamin C mg.)	104	205	220	-

GH provided high calorie diet for ordinary children diet and it was found more than 200 KCal. higher than the recommendation. Fat given in the GH and PH_1 was more than the recommended allowance. The amount of protein given in all the hospital dietary department was less than the recommendation.

Diabetic Diet

In GH only, 1800 K.Cal. standard diabetic diet scale was followed. But this type of standard diabetic diet should not be given to all the patients since the requirements for each diabetic patient varies. Diabetic diet was provided in PH_1 and Ph_2 as low calorie diet, to suit individual needs.

Different diets were given in PH_1 and PH_2 for diabetics to suit their individual as 1000 K.Cal. 1200 K.Cal., 1500 K.Cal., 1800 K.Cal. and 2000 K.Cal. energy requirements. In the private hospitals the cereal content of the diabetic diet was found to be more than that recommended. The quantitative adequacy of pulses and vegetables were satisfactory and so was the content of milk and milk products in the diet. The intake of meat fish and eggs was only half the amount prescribed, (Table (XIII).

In GH, inspite of being a diabetic diet, the high calorie food stuffs - like coconut and roots and tubers were used.

TABLE XIII

COMPOSITION OF 1800 K.Cal. DIABETIC DIET AS COMPARED AGAINST PRESCRIPTION BY NAC

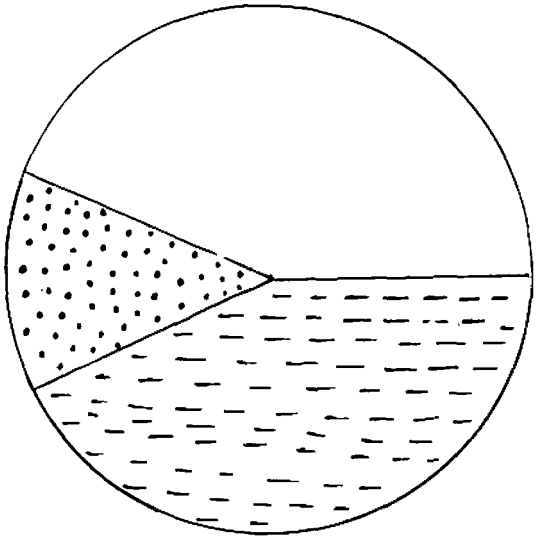
Food Stuff	Hospital Dietary Departments						Nutritional Advisory Committee	
	GH		PH_1		PH_2			
	V	NV	V	NV	V	NV	V	NV
Cereals	100	-	200	200	250	250	100	100
Pulses	50	-	90	50	75	50	50	25
Leafy Vegetables	300	-	100	100	100	100	200	200
Roots and Tubers	150	-	120	120	20	20	-	-
Other Vegetables	150	-	150	150	300	300	200	200
Fruits	240	-	300	175	125	125	200	200
Milk	500	-	400	400	400	400	500	500
Curds	-	-	200	200	100	100	200	200
Butter Milk	500	-	-	-	200	200	-	-
Fats and Oil	30	-	10	10	20	20	35	35
Meat and Fish	-	-	-	50	-	50	-	100
Eggs	-	-	-	50	-	50	-	50
Cane Sugar and Jaggery	-	-	-	-	-	-	-	-
Coconut Fresh	30	-	-	-	-	-	-	-
Bread White	100	-	-	-	-	-	50	50

V - Vegetarian NV - Non-Vegetarian

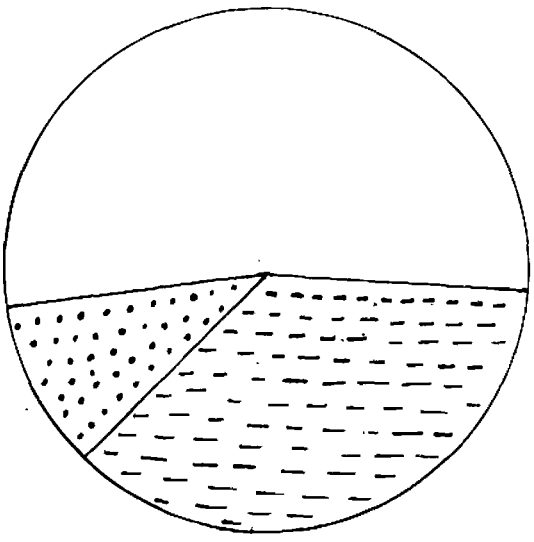
According to Nutritional Advisory Committee (1973) Low carbohydrate, normal protein and high fat diet was prescribed for Diabetics. However a study of diabetic diets given in all the Hospital Dietary Departments followed a high carbohydrate, high protein and low fat dietary regimen. (Fig. 6) explain the calorie distribution of carbohydrate, protein and fat in OH, PH_1 and PH_2 as compared with the sub committee recommendations (Table XIV).

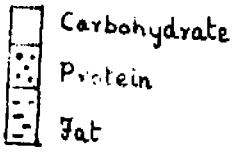
CALORIE CONTRIBUTION OF CARBOHYDRATE, PROTEIN, FAT IN 1800 CALORIE DIABETIC DIET

NUTRITIONAL ADVISORY COMMITTEE RECOMENDATION

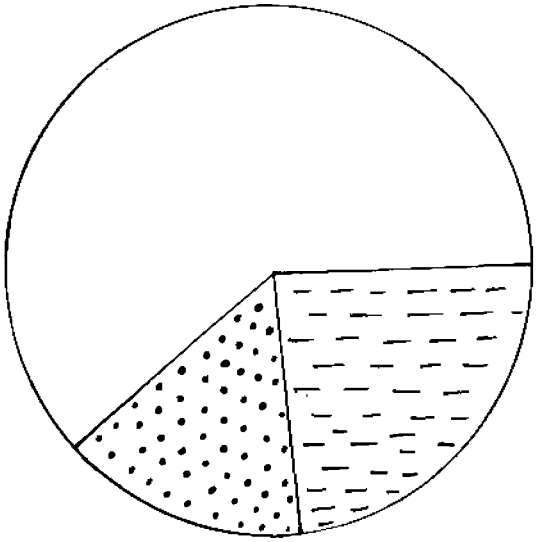


GH

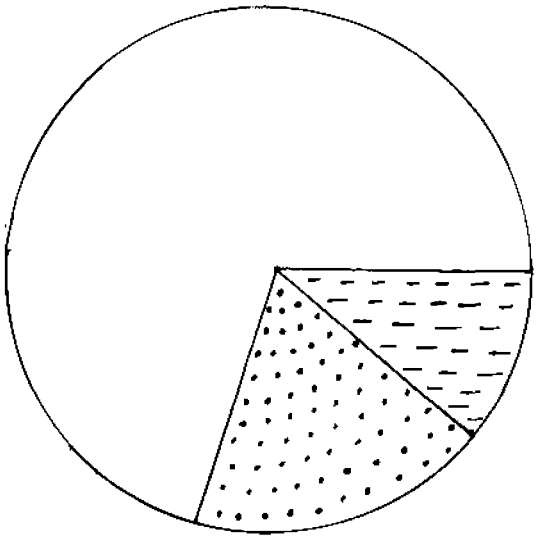




PH_1



PH_2



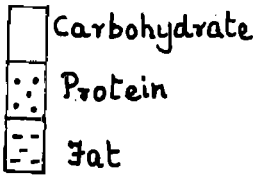


TABLE XIV

NUTRITIVE VALUE OF DIABETIC DIET

Nutrients	Hospital dietary department						Nutritional Advisory Committee	
	GH		PH_1		PH_2			
	V	NV	V	NV	V	NV	V	NV
Energy K.Cal.	1800	-	1796	1810	1808	1807	1800	1800
CHO (g.)	238	-	293	265	275	257	200	200
Protein (g.)	56	-	67	80	68	73	60	70
Fat (g.)	68	-	41	60	48	57	85	80
Fibre (g.)	9	-	9	8	9	8	-	-
Iron (mg)	21	-	25	23	60	59	-	-
Vitamin A (Carotene μg.)	4033	-	1134	2214	6165	6542	-	-
Vitamin B (mg)	398	-	269	219	464	462	-	-

V - Vegetarian

NV - Non-Vegetarian

Renal Diet

From the study it was found that in PH_1 Renal diet was provided at different protein levels (20 gm., 30 gm., 40 gm., and 60 gms.). The amount of foodstuffs given to the renal patients as per the different requirements is given in Table (XV).

TABLE XV

COMPOSITION OF RENAL DIETS - PH_1

Food Stuffs in g.	Different Protein levels							
	20 gm.		30 gm.		40 gm.		60 gm.	
	V	NV	V	NV	V	NV	V	NV
Rice Parboiled milled	100	100	150	150	150	150	225	225
Milk Cow's	100	50	300	100	600	100	600	300
Curds	100	50	200	200	200	200	200	200
Oil	40	40	40	40	40	40	30	30
Cane Sugar	40	40	40	40	40	40	40	40
Sago	75	75	75	75	50	50	50	-
* Veg. A	75	75	75	75	75	75	100	100
* Veg. B	75	75	75	75	75	75	100	100
Egg Hen's	-	50	-	50	-	50	-	50
Mutton	-	-	-	25	-	50	-	100

V - Vegetarian NV - Non-Vegetarian

* Veg. A - Leafy Vegetables, Gourd variety, Brinjal, French beans, Knol-Khol etc.

Veg. B - Beet root, Carrot, Potato, Onion etc.

TABLE XVI

NUTRITIVE VALUE OF RENAL DIET IN PH$_1$

Nutrients	20 gm.		30 gm.		40 gm.		60 gm.	
	V	NV	V	NV	V	NV	V	NV
Energy K.Cal.	1368	1326	1672	1622	1775	1625	2086	1856
Protein (g.)	20	20	30	30	39	39	61	61
Fat (g.)	52	50	60	58	72	64	81	68
CHO (g.)	205	199	253	245	243	223	297	250
Sodium (mg.)	100	102	140	170	200	200	255	245
Potassium (mg.)	900	612	1150	960	1610	1150	2100	1500

V - Vegetarian

NV - Non-Vegetarian

The Table XVI shown the nutrients provided for the Renal diet. It was found that the diet did not meet the energy requirement because of the restriction in protein intake. The restriction of sodium and potassium was taken care off.

Milk and Bread diet and soft diet

This diet according to the Sub-Committee Report (1973) should provide calories 2250, protein 60 g, Fat 55 g. and carbohydrate 360 g. As against this, convalescent Milk and Bread diet given by GH provided 1400 calories, 56 g. of protein, 36 g. fat and 188 g. of carbohydrate. Regular diet modified in consistency was given as soft diet in PH_1 and PH_2.

Liquid diet

According to the Sub Committee Recommendation a liquid diet should provide calories 1500, protein 45 g., fat 60 g., and carbohydrate 190 g. Liquid diet was given under the name Thoracic diet in GH provided 65 g. of protein, 64 g. of fat, 100 g. of carbohydrate and 1230 calories. Both vegetarian and Non Vegetarian liquid diet provided in PH_1 supplied adequate amounts of protein and fat (45-60 g.), 200 g. of carbohydrate and 1400-1500 K.Cal.

In PH_2 clear liquid and full liquid diets were provided to the patients. Glucose, protein concentrates formed part of the diet. These were inadequate to meet the allowances. However these diets were followed only for short duration.

Tube feeding (Vegetarian and Non-Vegetarian)

This diet was supplied only in PH_1 and PH_2 and it was compared with the Sub Committee Recommendation. It was given as 45 g. of protein, 60 g. of fat and 190 g. of carbohyrate for 1500 K.Cal. tube feeding and it was found adequate in all the nutrients.

T.B. Diet and High Calorie Diet

High calorie, high protein diet should be given to the Tuberculosis patients and patients suffering from other metabolic disorders. The T.B. diet for adults provided in GH provided 100 g. of protein, 105 g. of fat, 490 g. of fat and 3300 calories.High calorie and high protein was calculated for each individual patients requirement and given to the patients in PH_1 and PH_2.

Salt Free Diet

Salt Free diet was not given to the patients in GH. In PH_1 and PH_2 care must be taken in salt restriction of patients suffering from renal and cardiovascular disease. No salt was added in any of the preparations.

Low Fat Diet

Mainly for the cardiac patients and patients suffering from gastro intestinal disorders low fat and low cholesterol diet was supplied only in PH_1 and PH_2.

The investigator attempted to find whether there exists any relation between Sub Committee recommendation (1973) and Diets provided by GH_0 PH_1 and PH_2 with respect to ordinary vegetarian diet and ordinary non-vegetarian diet.

The correlation analysis adopted revealed that there exists a positive relation between the sub-committee recommendation and the ordinary diet supplied by all the dietary departments.

Ordinary Vegetarian diet

GH	1.714
PH_1	1.717
PH_2	1.715

Ordinary diet Non-Vegetarian

GH	0.99
PH_1	1.0
PH_2	1.0

F. Diet Counselling to the Patients

The diet counselling plays an important role in changing the food habits of the patients. In the

GH, since there was only one dietitian, she had to do all the work and it was not possible for her to go ward rounds each day. The diet prescribed by the nurse on behalf of the Physician was taken into consideration and only special diets prescribed by the doctor. Usually nobody gave importance to diet part in the treatment of disease. The doctors or nurses never forward the patients for dietary advice to the dietitian and therefore no diet counselling was offered in GH.

In both the private hospitals, dietitian incharge of each ward, visited daily and checked with the diet prescribed by the physicians. The dietitian daily met the patients and asked for change or modification in their diet pattern within the prescribed limits. Dietitian took diet orders through telephone or diet change slip from the ward boys. A separate out patient diet clinic functioning. Senior dietitian, in consultation with patients prescribed diets after taking nutritional assessment, following diet histories of the patients. Diet sheets were given to the patients in their respective regional language after explaining it completely. Dietitians used charts, models, booklets, samples to educate the patients.

Mostly diabetic, obese, kidney disorder and cardio vascular disorder patients came for diet counselling. Diet counselling given to patients and his attendant made them aware of the dietary modification needed for their condition.

Summary and Conclusion

V SUMMARY AND CONCLUSION

To understand the present situation of hospital dietary service,

The present study was undertaken with the objective of understanding organisational set up and functioning of dietary departments and evaluate the adequacy of diets served in Government and private hospitals.

Dietary departments in one Government and two private hospitals were studied using the methods of personal interview and observation with the help of schedule and check-list.

The data obtained revealed the following -

1. The organisational set up in the Government hospital was line type as against line and staff in private hospitals.

2. All the hospitals were under trained dietitian. There was only one dietitian assisted by other staff for food preparation in the Government Hospital as against one chief dietitian assisted by 2 other dietitians in both the private hospitals. In the Government hospital infact the number of patients catered to was 3 to 5 times as that of the private hospitals.

3. The maximum number of patients catered per day amounted to 1500 in the Government hospital as against 400 to 450 and 160 to 190 in PH_1 and PH_2 respectively.

4. In Government hospital, physical facilities, personnel facilities, training of personnel, appeared to be inadequate when compared with the dietary departments of two private hospitals.

5. Good sanitary practices were observed in the private hospitals while in the Government hospitals, the infrastructure of the dietary department is poor not facilitating sanitary and hygienic practices.

6. Depending on the need of the patient, a wide variety of diets such as full diet, children diet, soft diet, milk and bread diet, high protein low fat, diabetic and salt free diet were supplied on prescription of the attending physician or surgeon in both the private hospitals. Apart from the normal standard diets namely full diet, full liquid diet soft diet the Government hospital offered only Diabetes diet and T.B. diet.

7. Government hospital dietary department provided meals at free of cost while in PH_1 the average meal cost range from Rs.11.50 for normal vegetarian diet to Rs.17/- per day for Regular European diet. PH_2 charged meals for each day according to the type of ward ranging from Rs.15/- to Rs.95/-.

8. The standard diet supplied to adults as well as children were based on a wide variety of seasonal foodstuffs and met allowances prescribed by Nutrition Advisory Committee.

9. Diet counselling or Nutrition Education was not given to any patients in GH, PH_1 and PH_2 provided with a good diet clinic, where, dietary advice was given to inpatients and outpatients regarding their nutritional problems.

These results suggest that dietary department in Government hospital require great attention in terms of adequate number of personnel and physical facilities. The dietitian in charge should be given to plan, prepare serve and evaluate the therapeutic diets served in the hospital.

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Appendices

APPENDIX I

SCHEDULE

I. General Information

1. Name of the hospital :
2. Year of starting the dietary department:
3. Overall incharge of the dietary department:
4. Name of the person incharge of dietary department:

II. Organisation and Management:

5. Organisation chart:
6. Is the department organised and directed by a professionally qualified dietition: Yes ☐ No ☐
7. Is there a written organisation plan designating areas of authority: Yes ☐ No ☐
8. Is supervision designated for all working hours : Yes ☐ No ☐
9. Number of patients daily catered.
   Maximum in the last 3 months:
   Minimum in the last 3 months:
   Number on date :
10. Is the department offered food for the following persons

	Yes	No
Patients attendents	☐	☐
Patients visitors	☐	☐
Out patients	☐	☐
Employees	☐	☐
V.I.P's	☐	☐

11. Is the department running a counter service/cafeteria for the outsiders? Yes ☐ No ☐

12. Staff position of the dietary department

Chief dietitian	-
Senior dietitian	-
Dietitian	-
Junior dietitian	-
Supervisor	-
Steward	-
Assistant Steward	-
Store Keeper	-
Stores Attendant	-
Clerk/Typist	-
Head Cooks	-
Cook	-
Assistant Cook	-
Masalchi	-
Cleaners	-
Food Service Waiters	-
Others	-
Total	-

13. Is the dietary department wants more staff? Yes ☐ No ☐

14. Supervision of foods done by:

a) Dietitian ▱

b) Catering Supervisor ▱

c) Food and beverage manager ▱

15. Inspection of food s done by

a) Lay Secretary ▱

b) General Superintendent ▱

c) Dietitian ▱

16. Collection of foods done by

a) Junior dietitian ▱

b) Clerk ▱

c) Cook ▱

17. Who is incharge of checking the trays

a) Junior dietitian ▱

b) Cooks ▱

c) Ward Sister ▱

18. Is the department giving foods to patients free of cost? Yes ▱ No ▱

If not, what is cost of regular meals?

19. Are the funds for the dietetics department is budgeted? Yes ☐ No ☐

20. Is the budget substantial enough to provide for nutritionally adequate and palatable meals.

Yes ☐ No ☐

21. Who prescribes the diet for patients?

a) Doctor ☐

b) Dietitian ☐

c) Nurse ☐

22. Who takes the diet order?

a) Dietitian ☐

b) Junior dietitian ☐

c) Nurse ☐

d) Interns ☐

III. Menu planning:

23. What is the type of menu?

a) Selective menu ☐

b) Standard cycle menu ☐

c) or both ☐

24. Who helped in planning the menu?

a) Dietitian ☐

b) Food and beverage manager ☐

c) Catering Supervisor ☐

d) Cook ☐

e) Diet manual ☐

25. Is the menu,

	Yes	No
a) Planned in advance to permit procurement production and service of quantity of food	☐	☐
b) Reviewed occasionally to ensure nutritional adequacy of individuals	☐	☐
c) Used standardized recipes	☐	☐
d) Do the hospital have a specific Diet scale:	☐	☐
e) Is there any choice of food offered within a Diet Scale	☐	☐
f) Is there any extra items provided	☐	☐

26. What are the different kinds of diets given to the patients?

IV. Mode of purchasing, storing and issuing items?

27. Who is incharge of purchasing?

Provisions -

Equipments -

28. Purchasing procedure:

a) Issue Indent ▱

b) Placing orders ▱

c) Calling tender ▱

29. Methods of purchasing:

a) Through contract ▱

b) By telephone ▱

c) By mail ▱

d) By competitive bidding ▱

30. Source of supply:

a) Producers ▱

b) Wholesalers ▱

c) Retailers ▱

d) Co-operatives ▱

e) Civil Supplies ▱

31. Frequency of purchases

	Daily	Weekly	Fortnight	Monthly	Yearly
Perishable items :					
Staple items :					

32. Methods of payments

a) Cash ▱

b) Cheque ▱

c) Credit ▱

33. Payments done by:

a) Dietary department ▱

b) Accounts Department ▱

c) Office ▱

34. Method of transport:

a) Cart ▱

b) Autorickshaw ▱

c) Lorry ▱

d) Manual ▱

e) BioCycle ▱

35. Who receives and checks the items?

a) Dietitian ☐

b) Store Keeper ☐

c) Steward ☐

36. Method of Checking:

a) Weighment ☐

b) Counting packages ☐

c) Counting numbers ☐

d) Others ☐

37. Types of storage

	Adequate	Inadequate
a) Dry storage	☐	☐
b) Cold storage		
i) Refrigeration facility	☐	☐
ii) Freezing facility	☐	☐

38. Issued by:

a) Store-Keeper ☐

b) Steward ☐

c) Dietitian ☐

39. Issued on the basis of

a) Strength of stores requisition ☐

b) Oral requisition ☐

c) Issued on the strength of beds ☐

40. Are store items weighed and then issued?

Yes ☐ No ☐

41. Are leftover materials taken back to stores?

Yes ☐ No ☐

42. Mention the type of records maintained by the Dietary department?

V. FOOD PREPARATION

43. List the items of food prepared daily.

44. Methods used in cooking the following items

	Boiling	Absorption	Straining method	Steaming	Frying
Rice					
Dhal					
Vegetables					
Mutton					
Fish					
Egg					

45. When are the vegetables being cut?

a) Just before cooking ▱

b) 2 hours before cooking ▱

c) Previous day ▱

46. What kind of fuel used?

a) Firewood ▱

b) Coal ▱

c) Gas ▱

d) Electricity ▱

e) Steam ▱

VI. FOOD SERVICE

47. Is the catering system operated under

a) centralised ▱

b) decentralised ▱

c) Satelite ▱

48. Who is incharge of distributing the food from dietary kitchen to different wards?

a) Cooks ▱

b) Dietitian ▱

49. Mode of transfering food to the wards:

a) Trolley ☐

b) Manually ☐

50. Who carries the foods to the wards?

a) Staff Nurse ☐

b) Ward boy ☐

c) Ward Sisters ☐

51. Who receives and distributes food in the wards?

a) Staff Nurse ☐

b) Ward boy ☐

c) Ward Sisters ☐

52. Who collects the food for the patient?

a) Patient ☐

b) Patient's attendent ☐

53. Whether there is a separate pantry for each ward?

Yes ☐ No ☐

54. Time of service for the following meals:

Bed coffee -

Breakfast -

Lunch -

Tea -

Dinner -

55. Whether the food in the ward is measured and distributed to the patients?

Yes ☐ No ☐

VII. QUALITY AND QUANTITY OF FOOD

56. Do the meals look

a) Very attractive ☐

b) Attractive ☐

c) Sales factory ☐

d) Unattractive ☐

57. Is the taste of the food

a) Good ☐

b) Satisfactory ☐

c) Poor ☐

58. Whether all the foods served at proper temperature?

Yes ☐ No ☐

59. Is the patient aware of the quantity of food needed for him/her?

Yes ☐ No ☐

60. If yes, how do theycheck for the quantity

a) Tray slip ☐

b) Oral information from nurse or dietitian ☐

61. Is the quantity of food served?

a) Too much ☐

b) Enough ☐

c) Too little ☐

62. Is there any plate waste? Yes ☐ No ☐

63. Are the patients satisfied with their food?

a) Fully ☐

b) Partially ☐

c) Not at all ☐

VIII. SANITATION AND FOOD HYGIENE

64. Is the crockery and cutlery?

a) Very clean ▱

b) Quite clean ▱

c) Not clean ▱

65. Is the people who transfers the food are?

a) Clean ▱

b) Fairly clean ▱

c) Dirty ▱

66. Is food handling

a) Sanitary ▱

b) Quite Sanitary ▱

c) Unsanitary ▱

67. Is service area

a) Clean ▱

b) Fairly clean ▱

c) Dirty ▱

68. As cooking area?

a) Very clean ☐

b) Quite clean ☐

c) Not clean ☐

XX. EMPLOYEES FACILITIES

69. Is there a shift system Yes ☐ No ☐

70. Are the workers trained for a particular job?

Yes ☐ No ☐

71. Do the hospitals have

	Yes	No
a) Employees canteen	☐	☐
b) Rest room	☐	☐
c) Locker facilities	☐	☐
d) Toilet	☐	☐

72. Health Service

	Yes	No
a) Available for all personnel	☐	☐
b) Is there any physical examination given before employment	☐	☐
c) Is annual physical examination required?	☐	☐

X. DIET COUNSELLING

73. Do the dietitian go on a regular bedside rounds? Yes ☐ No ☐

74. Whether the hospital offering dietary counselling to the outpatients? Yes ☐ No ☐

75. What are the common complaints the patients have who needs diet counselling?

76. Diet counselling is given to the

a) Patient ☐

b) Person accompanying patient ☐

c) Both ☐

77. Who gives the diet counselling

a) Chief dietitian ▱

b) Senior dietitian ▱

c) Physician ▱

d) Nurse ▱

78. Do the diet counselling make the patient aware of his/her condition and the dietary modification needed for the same?

Yes ▱ No ▱

APPENDIX II

CHECK LIST

1. Food Items	Good	Satisfactory	Poor
a) Coffee			
b) Tea			
c) Milk			
d) Soup			
e) Fruit juice			
f) Breakfast items			
g) Meat, fish diet			
h) Egg			
i) Rice			
j) Dhal			
k) Bread			
l) Vegetables			
m) Fruits			
n) Chappathi			

2. Physical Layout and Facilities

	Good	Fair	Poor
Area	-		
Equipment	-		
Ventilation	-		
Lighting	-		
Control of rodents and insects	-		
Personnel facilities	-		
washing area	-		

APPENDIX III

CORRELATION ANALYSIS

ORDINARY VEGETARIAN DIET - GR

X	$X-\bar{X}$	x^2	Y	$Y-\bar{Y}$	y^2	xy
2500	+ 1736.25	3061442.80	1905	1312.75	1723312.50	2279262.10
420	- 343.75	118164.06	370	- 222.25	49395.06	76393.44
75	- 688.75	474376.56	80	- 512.25	294036.06	373474.68
60	- 703.75	495264.06	25	- 567.25	321772.56	399202.18
3055		1394247.48	2696		2388515.18	3128337.40

$\bar{X} = \frac{3055}{4} = 763.75$

$\bar{Y} = \frac{2360}{4} = 592.25$

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \cdot \Sigma y^2}}$$

$$r = \frac{3.128.10^6}{\sqrt{1.394 \times 10^6 \times 2.389 \times 10^6}}$$

$$= \frac{3.128 \times 10^6}{1.825 \times 10^6} = 1.714$$

PH_1

Y	$Y - \bar{Y}$	y^2	xy
2208	1534.25	2353923.0	2663841.40
360	- 313.75	98439.06	107851.56
75	- 598.75	358501.56	412339.06
52	- 621.75	386573.06	437556.56
2695		3197436.68	3621638.58

$$\bar{Y} = \frac{2695}{4} = 673.75$$

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 \cdot \Sigma y^2}}$$

$$= \frac{3.622 \times 10^6}{\sqrt{1.39 \times 10^6 \times 3.20 \times 10^6}}$$

$$= \frac{3.622 \times 10^6}{2.109 \times 10^6} = 1.717$$

PH_2

Y	$Y - \bar{Y}$	y^2	xy
2268	1608	2585664	2791390.0
356	- 334	111556	114812.5
76	- 614	376996	422892.5
60	- 630	396900	443362.5
2760		3471116	3772957.5

$$\bar{Y} = \frac{2760}{4} = 690$$

$$r = \frac{3.773 \times 10^6}{\sqrt{1.394 \times 10^6 \times 3.471 \times 10^6}}$$

$$\frac{3.773 \times 10^6}{2.20 \times 10^6} = 1.715$$

CORRELATION ANALYSIS

ORDINARY NON VEGETARIAN DIET

ON

X	$X - \bar{X}$	x^2	Y	$Y - \bar{Y}$	y^2	xy
2500	1737.5	3018906.25	1975	1368.75	1873476.5	2378203.10
400	- 362.5	131406.25	356	- 250.25	62625.06	90715.63
80	- 682.5	466806.25	59	- 547.25	299482.56	373498.12
70	- 692.5	479556.25	35	- 571.25	326326.56	395590.62
3050		4096675.00	2425		2561910.63	3238007.47

$$\bar{X} = \frac{3050}{4} = 762.5 \qquad \bar{Y} = \frac{2425}{4} = 606.25$$

$$r = \frac{3.238 \times 10^6}{\sqrt{4.095 \times 10^6 \times 2.562 \times 10^6}}$$

$$= \frac{3.238 \times 10^6}{3.239 \times 10^6} = 0.99$$

Pb_1

X	$X - \bar{X}$	y^2	xy
2193	+ 1525.5	2327150.2	2650556.20
340	- 327.5	107256.2	113718.75
80	- 587.5	345156.2	400968.75
57	- 610.5	372710.2	422771.25
2670		3152272.8	3593014.95

$$\bar{X} = \frac{2670}{4} = 667.5$$

$$r = \frac{3.593 \times 10^6}{\sqrt{4.096 \times 10^6 \times 3.152 \times 10^6}}$$

$$= \frac{3.593 \times 10^6}{3.593 \times 10^6} = 1.0$$

Ph_2

Y	$Y - \bar{Y}$	y^2	xy
2236	1559.75	2432820.00	2710065.60
320	- 356.25	126914.06	1129140.62
77	- 599.25	359100.56	438988.12
72	- 604.25	365113.06	418443.12
2705		3283962.68	3666637.46

$$\bar{y} = \frac{2705}{4} = 676.25$$

$$r = \frac{3.667 \times 10^6}{\sqrt{4.096 \times 10^6 \times 3.284 \times 10^6}}$$

$$= \frac{3.667 \times 10^6}{3.667 \times 10^6} = 1.0$$