"Implementation of Clinical Nutrition Module

&

Study on Satisfaction rate among end users after implementing software in a Multi-Specialty Hospital"

A Dissertation submitted in partial fulfilment of the requirements for the award of

Post – Graduate Diploma in Health and Hospital Management

By

Vineetha S Pai

PG/13/075

Under the Guidance of

Dr Anandhi Ramachandran

International Institute of Health Management Research

New Delhi

Date: **19th May 2015**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Vineetha S Pai** , student of Indian Institute of Health Management & Research, New Delhi pursuing PGDHHM, has successfully completed her dissertation project on "**Implementation of Clinical Nutrition Module and Conducting Post Implementation Satisfaction survey among end users"**. at Sakra World Hospital (A Unit of Takshasila Hospitals Operating Private Limited) from **19th February 2015** to **19th May 2015,** under the supervision and guidance of the Deputy General Manager.

During the dissertation, she was found to be sincere, dedicated and hardworking. She has also shown a great passion towards learning.

We wish her a successful career ahead.

For **Takshasila Hospitals Operating Pvt. Ltd**

S.V. Kiran

S V Kiran
Group Vice President – Human Resources

A Kirloskar + Toyota Tsusho + Secom Hospitals Japan Venture

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms Vineetha S Pai student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at **Sakra World Hospital, Bangalore** from **19th February 2015 to 19th May 2015.**

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

Dr. A.K. Agarwal
Dean, Academics and Student Affairs
IIHMR, New Delhi

Dr Anandhi Ramachandran
Associate Professor
IIHMR, New Delhi

Certificate Of Approval

The foll'owing dissertation titled **"Implementation of ClinicalNutrition Module & Study on Satisfaction rate among end users after implementing software in a Multi-Specialty Hospital"** at **"Sakra World Hospital** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
S. V. Adhikari	
Dr. D Narayana Sivakiri	
VINAY TRIPATHI	Vinay Tripathi

Certificate from Dissertation Advisory Committee

This is to certify that **Ms Vineetha S Pai,** a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. She is submitting this dissertation titled "**Implementation of Clinical Nutrition Module and Post Implementation Satisfaction Survey among end users in a Multi Specialty Hospital**" at Sakra World Hospital in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management.**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr Anandhi Ramachandran,
Associate Professor,
IIHMR

Dr.Sunil Kumar Sharma
Senior Manager- IT
Sakra World Hospital

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"Implementation of ClinicalNutrition Module & Study on Satisfaction rate among end users after implementing software in a Multi-Specialty Hospital"** and submitted by **Ms Vineetha S Pai** Enrollment No. **PG/13/075** under the supervision of **Dr Anandhi Ramachandran** for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **19th February 2015 to 19th May 2015**embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Vineetha · S · Pai

Signature

FEEDBACK FORM

Name of the Student: Vineetha S Pai

Dissertation Organisation: Sakra World Hospital Bangalore

Area of Dissertation: IT

Attendance: Punctual

Objectives achieved: Implemented Clinical Nutrition Module & did post implementation survey of the users.

Deliverables: - She has completed the tasks assigned to her

Strengths: Candidate is honest & hardworking.

Suggestions for Improvement: She should improve her communi-cation and should express her views.

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

Dr. Sunil Sharma

Date: 19th May 2015
Place: Devarbisinahalli

Acknowledgement

I would like to express my deepest gratitude to Mr. Vikas Kumar Sharma (Deputy General Manager IT) for giving me an opportunity to do my Dissertation and to learn various aspect of Healthcare IT in hospital.

My deep gratitude to Dr. Sunil Sharma (Senior Manager-IT) for his continuous support, involvement and encouragement during Dissertation.

I also thank Mrs. Megha Srivastava (Deputy Manager) for providing her valuable suggestions & guiding throughout the training. I also thank all persons in IT Department for their continuous support and guidance.

My sincere acknowledgement goes to Dr.Anandhi Ramachandran, my mentor, for her kind assistance and support throughout my project.

I am also very much thankful to my Family & Friends who always encouraged me to follow my dreams.

Abstract

Background behind the study: In hospital, the clinical nutrition department strives to meet the therapeutic nutritional needs of the patients by complying with physician orders. The delivery of high quality nutritional care to patients becomes very difficult due to too many activities. In manual process there are chances of errors because they are manually entering data. In hospital, the process of diet plan to food dispatch, and food order in taking of patients was done manually. So after implementing the clinical nutrition module, all process is automated. After implementing software, we want to understand the satisfaction rate among the end users. End user satisfaction is significant to successful implementation of any information system

General Objective: To study the satisfaction rate of staff members after implementing Clinical Nutrition Module.

Specific Objective:

- To study the satisfaction rate among nurses post implementation
- To study the satisfaction rate among nutritionists post implementation
- To study the satisfaction rate among F&B staffs post implementation

Method: A quantitative cross sectional study was carried out among 55 end users like Nurses, Nutritionists and F&B staffs. The data was collected using a questionnaire based on 5 point Likert scale from strongly agree to strongly Disagree (5-1). 3 sets of questionnaire were used for the study.

Data Analysis: The collected data was analysed using SPSS.16 and presented in terms of frequency, Percentage and mean**.**

Results: The study results show that nurses and F&B staffs were satisfied with the features of the clinical nutrition module and understood the benefits achieved from implementation whereas nutritionists were not satisfied with the implementation.

Conclusion: The success of any IT System implementation and adoption rate among end users depends on the perceived usefulness and ease of use of the system which in turn depends on the satisfaction of the end users on features and usability. This study helped to understand about the satisfaction rate of the end users which proves that there is always a scope of continuous improvement in the system to improve the operations of the system resulting in satisfaction to end users.

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Abbreviations:

CCU: Critical Care Unit

CTVS: Cardiothoracic and Vascular Surgery

HIS: Hospital Information System

F&B: Food and Beverage

ICU: Intensive Care Unit

IT: Information Technology

PACS: Picture Archiving and Communication System

SD: Standard Deviation

SPSS: Statistical package for Social Science

Part 1: Internship Report

Introduction

About Hospital

Sakra World hospital, 350 bedded multispecialty hospital situated in Bangalore which is a joint venture of Toyota, Kirloskar Group, Tsushi and Japanese Company Secom. Sakra World Hospital comes under Takshasila Healthcare and Research Services Private Limited. It is India's first MNC hospital committed to the advanced medical care that enhances the value of human life. Sakra combines synergies of these large entities to provide the cutting-edge medical technologies and herald a change in the current healthcare systems and processes. Sakra is dedicated to ensuring good health of the community.

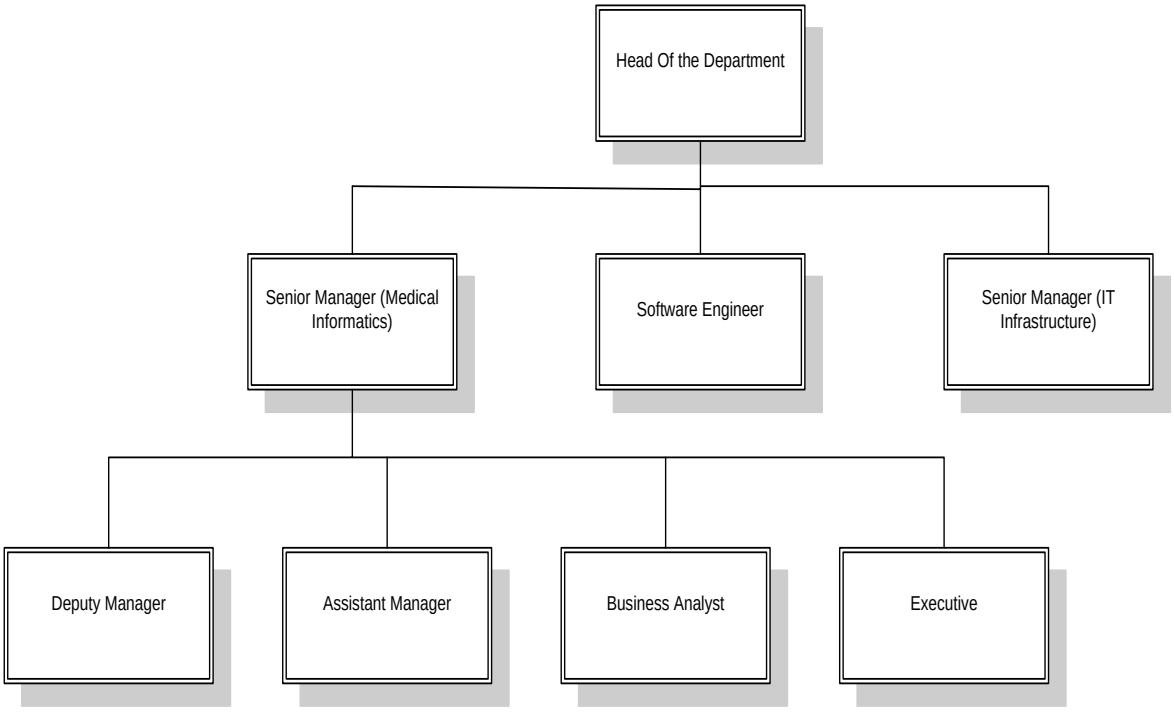
- **Mission**: Providing High Quality care through cutting edge technology and highly skilled man power. Caring beyond the treatment include complete after-care. Being responsible for the patient's well-being and continuous enhancement of his quality of life
- **Vision**: We commit to medical care that enhances the quality of human life
- **Four Pillars of the Hospital**: Skill, Family atmosphere, Technology, Ethics
- Centers & Specialties' of the Hospital
  - Cardiac Sciences
  - Neurosciences
  - Orthopedics
  - Women and Child Health
  - Digestive and HPB Sciences
  - Renal Sciences
  - Cancer and Blood Disorder
  - Psychiatry
  - ENT and Head Neck Surgery
  - Internal Medicine
  - Endocrinology Diabetes Thyroid and Osteoporosis
  - Rheumatology
  - Respiratory medicine
  - Ophthalmology
  - Plastic and reconstructive Surgery
  - Dentistry
  - Interventional Radiology and Imaging

Information Technology (IT) Department

IT Department provides information technology services to the hospital.

- Functions
    - Responsible for providing end user training and support for HIS, AX application, PACS, Lab Interfaces and Computers.
    - Responsible for implementing and providing post go live support.
    - Management of Help Desk Manager application to record and track the complaint and requests which are registered by the users.
    - To Manage and maintain hardware and networking infrastructure.
    - Maintaining, storing, retrieving and transferring records and information.
    - Responsible for securing all the system data.
    - Responsible for providing uninterrupted IT services

Organogram of the IT Department



Health Informatics

Health informatics is an evolving specialization that links information technology, communications and healthcare to improve the quality and safety of patient care. Health informatics applies informatics concepts, theories, and practices to real-life situations to achieve better health outcomes. This includes collecting, storing, analyzing, and presenting data in a digital format. Health Informatics can be defined as the interdisciplinary study of the design, development, adoption, and application of IT-based innovations in healthcare services delivery, management, and planning.

Hospital Information System

Hospital information System (HIS) can be defined as massive integrated systems that support the comprehensive information requirements of hospitals, including patient, clinical, ancillary and financial management. Hospitals are complex institutions with larger departments and units coordinate care for patients. Hospitals are becoming more reliant on ability of hospital information system (HIS) to assist in diagnosis, management and education for better and improved services and practices. In health organization such as hospitals, implementation of HIS is inevitable due to any mediating and dominating factors such as organization, people and technology. A fully integrated hospital management information system caters for clinical, administrative and financial needs of a modern hospital. It utilizes information technology to simplify day to day tasks of running an efficient hospital and at the same time provide management with necessary information to make strategic decisions. It consists of a range of application modules that support the administrative, financial and clinical information needs of today's modern hospital. Each module can implement individually or be combined to form an integrated system to suit each hospital's needs. HIS is also known Hospital Management System (HMS) or Clinical Management System.

Benefits

- Easy access to physician data to generate varied records , including classification based on demographics , gender, age and so on.
- Efficient and accurate administration of finance, diet of patient, engineering and distribution of medical aid.

- Improved monitoring of drug usage and study of effectiveness. This lead to the reduction of adverse drug interactions while promoting more appropriate pharmaceutical utilization.
- It is easy to use and eliminates error caused by handwriting.
- Enhances information integrity, reduces transcription errors and reduces duplication of information entries

Hospital Information System consists of different modules. They are

- ADT- Admission, Discharge and Transfer Module: This ADT module controls the movement of in-patients within the hospital. This starts with the pre-admission routine that provides advance information on patients scheduled for admission. The ADT module is usually integrated with other HIS modules and Central Patient Index (CPI) module. It provides the authorized system user with up-to-date information on patient status, expected admissions and discharges, overstays, etc. It also provides information on hospital resource management such as bed availability, and transfers discharge data.
- Pharmacy Module: The Pharmacy package provides a method of management, dispensing, and administration of inpatient drugs within the hospital. Hospital Medications combines clinical and patient information that allows each medical center to enter orders for patients, dispense medications by means of Pick Lists, print labels, create Medication Administration Records (MARs), and create Management Reports.
- Laboratory Module/ Laboratory Information System: Laboratory Information System (LIS) or Laboratory Management System (LMS), is a software-based laboratory and information management system that offers a set of key features that support a modern laboratory's operations. Those key features include — but are not limited to — workflow and data tracking support, flexible architecture, and smart data exchange interfaces, which fully "support its use in regulated environments." The features and uses of a LIMS have evolved over the years from simple sample tracking to an enterprise resource planning tool that manages multiple aspects of laboratory informatics. Laboratory module enables the user with Ordering of tests and procedures on both patient and non-patient specimens, Collection and Accessioning of specimens into the Laboratory database, Processing and analysis in appropriate department or work areas, review and verification

of results, Reporting of results and/or diagnoses for clinical health care treatment, Analysis and reporting of quality control data used in generating results and Providing management statistical data as well as requirements for accreditation by regulating bodies and agencies

- Radiology Module/ Radiology Information System: Radiology information system (RIS) is a computerized database used by radiology departments to store, manipulate, and distribute patient radiological data and imagery. The system generally consists of patient tracking and scheduling, result reporting and image tracking capabilities. RIS complements HIS (Hospital Information Systems), and is critical to efficient workflow to radiology practices.
- Nursing Module: Nursing module facilitates smooth flow of nursing activities in the hospital and helps in developing a care plan to improve quality of patient care. Flow of information from other clinical modules ensures the nursing staffs are well aware about each patient, giving them access to necessary clinical details.
- Blood Bank Module: This module helps in maintaining all information regarding the blood donation. The details about the donors and recipients are maintained. The module is linked to other modules of HIS. Important information and parameters such as availability of blood, cross-matching between donor's and recipient's blood groups and blood transfusion reactions are recorded.
- Front Office Module/ Registration Module: The registration module is an efficient patient management system that eases capturing of pertinent information of the patients. The patient administration functionalities of the hospital can be automated with this module to provide proficient patient care. The scheduling of patient and physician appointments can be done from this module. The details about schedule of a physician, slots available in his schedule, scheduled slots, blocked slots, tracking of patients and their visits, scheduling appointments for unregistered patients and emergency patients can be viewed effortlessly.

Internship Report

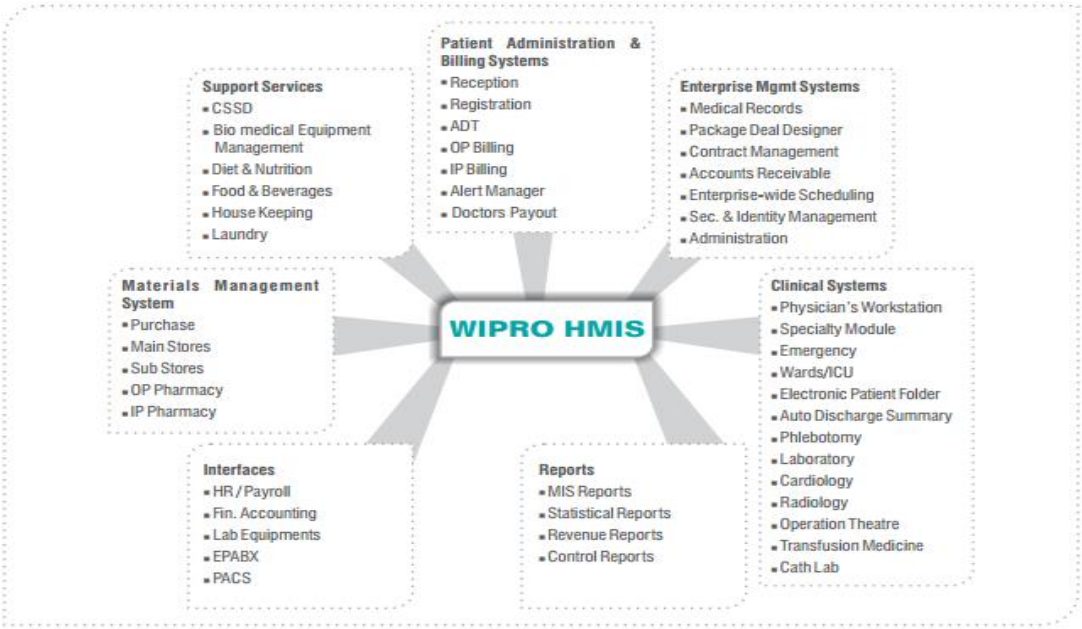
The internship period was from 19th February 2015 to 19th May 2015. During this period worked as an intern in the IT Department for implementing the Clinical Nutrition Module in Sakra World hospital, 350 bedded multispecialty hospital situated in Bangalore.

Project Overview

The delivery of high quality nutritional care to patients becomes very difficult with many manual activities, duplicate work and many activities. In manual process there are chances of errors because they are manually entering data. In Sakra World Hospital, the process of diet planning to food dispatching, and food ordering was done manually. So to streamline the process for better outcome and efficiency, the hospital management decided to implement the clinical nutrition module of Wipro HIS.

About Wipro HIS 4.0

Wipro's Hospital Information System is a comprehensive solution that automates the clinical, EMR, administrative and supply-chain functions, thereby enabling the improvement of operational effectiveness, reduction in costs & medical errors, while raising the quality of patient care



Technical Details: Wipro HIS Version 4 application. Front end application software on .Net framework, C# and ASP. Back end Data were maintained in SQL server 2008 .

Activity and Time Allocation:

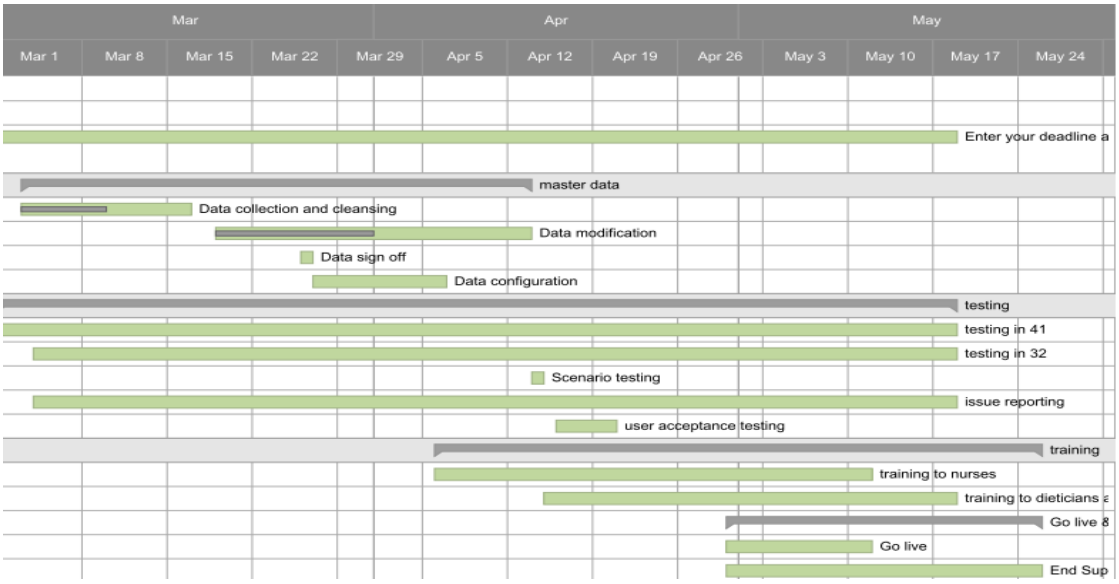


Figure 3: Activities and Time allocation

Internship Details

- Initially was given brief introduction about the team (IT Team) and the workflow of the IT Department.
- Received training and hands on practice on HIS and the clinical nutrition module which included the front end applications and the build/ configuration of clinical nutrition module.
- After the training and hand on practice I was assigned to the implementation Team. Team consisted of 4 associates for configuration, data modification, testing, training, and providing support.
- Helped in preparing the implementation plan
- Worked on the Master Data configuration of clinical nutrition module. This was done before testing in live (Production) and test server.
    a. Diet category, Diet type, Meal type, Food forms, Cuisine, Quantity, Serving unit, Food form, Calorie, AMD classification, Spiciness level, Shelf Life, Packing, Storing temperature, Serving temperature etc. were created.

b. Food items were created where each food items have food code, diet type, cuisine, quantity, serving unit, food form, calorie, AMD classification, Spiceness level, Shelf Life, packing, Storing temperature, serving temperature.
c. After creating food items, each food items were mapped to the food item groups like beverages, lunch, dinner, breakfast, high tea, soup services and accomplishment.
d. After creating food item group, the food item group was mapped to menu group.
e. Then cyclic diet master was created. In this hospital, 14 days menu were created. In Cyclic diet Menu, Diet category, diet type, meal type and cuisine was selected and cyclic diet was created for each diet category and each meal type. In daily menu, for every Diet Category and each meal type food menus were entered

- Prepared training plan, user manuals, presentation materials and trained and evaluated end-users.
- Testing the application before going live to test the flaws in the software.
    a. Software testing was done before implementing the software. End to End work flow was tested. Scenario testing were tested by the end users and were documented.
    b. User Acceptance Tests were conducted by end users
- Training was given to Nurses, Dieticians, and staffs in F&B.
- Provided active support during go-live and post go live
    a. Go live was phase wise. First was in CTVS Adult, where nurse refer the diet and nutritionist prepare the diet plan and F&B acknowledge and Dispatch the food to respective patients.

Lessons Learned

- Configuration the Master Data for implementing the module
- Planning and executing the implementation of HIS. (Details regarding the project planning and execution mentioned below)
- Testing and testing process of the software to ensure quality
- Learned Work flow of Nutrition Department and prepared training plan, materials. Training and evaluating end users (User Guide is mentioned below)
- Post Go Live support, Issue handling and maintenance

Implementation of Clinical Nutrition Module (Lesson Learned)

Expected Outcome: To Successfully Implement the clinical nutrition, F&B and Support services module

Time Frame- 20th February 2015 to 19th May 2015. (Three months which include Data preparation, data cleansing, configuration, training, Go live and end support.)

- **Initial Phase:** During initial Phase meeting was held with the Head of the Department IT, Senior Manager IT, Deputy Manager IT and Head of the Department Clinical nutrition.
- **Planning Phase:** Data were collected and resources, training, go live and risk management were planned and communicated with all stake holders
- **Execution Phase:** Master data were configured, training to the super users and end users were conducted. Application was tested and issues were logged and resolved.Support to the end users were provided during Go live.
- **Closing Phase:** Survey was conducted among end users

Sl. No.	Milestones	Key Tasks
1	Master Data	Data collection, data cleansing data preparation, finalization, validation of food masters and menu
		Sign off the food Masters
		Master Data Configuration
2	Testing	Testing the module
		Issue reporting
		Issue fixing
		Scenario Testing
		User Acceptance Testing and documenting.
3	Training	Training Plan
		Super User training
		End user (nurses, F&B staff, Nutritionist Training)
		Training Document
		User Access creation
4	Go Live	Go Live Document
		Go live 1st phase
		Go Live2nd Phase
		Go live 3rd phase
		Go Live 4th Phase
5	Monitoring	Evaluation of go live with staff
6	End Support	Support given to all staff members
		Training of new personnel

Resource Plan

Sl. No.	Activity	Resources
1	Data Modification	2
2	Testing: Issue and follow up in issues	3
3	Dietary Master Configuration	4
4	Diet Menu Configuration	4
5	Creation of users and Roles	1
6	Training for nurses, Dieticians, and F&B	3
7	Evaluation of Training and ground check	3
8	Go live Phase wise	3
9	Support	3

Key Roles and Responsibilities

- Manager-
  - Accountable for overall execution, management and delivery of a project
  - Manages and resolves issues
  - Plans and manages project activities
  - Manages project schedule
  - Tracks and reports project progress
  - Plans the Go live activities
  - Communicating with Head of the department
- Assistant Manager-
  - Performs data Configuration, Testing
  - Issue and Bug Reporting
  - Change management reporting
  - Managing training to end users
- Intern-
  - Performs data Configuration
  - Reports Issues and bugs to manager
  - Provides end User Training
  - Execution of plan
  - Testing
- Super User
  - Testing

Training Plan

Sl. No.	Users	Date
1	Super users	14th April 2015
2	Nurses (5th, 6th Floor)	14th April 2015
3	Nurses(3rd, 4th floor)	15th April 2015
4	Nutritionist	15th & 16th April 2015
5	Nurse (ICU,CCU,CTVS,)	17 & 30th April, 4th & 5th May 2015
6	F&B Staff	20th & 21st April 2015
7	Nutritionist	30th April, 2nd & 4th May 2015

Communication Plan

Sl. No.	Communication	Medium
1	With Dietician, Nurses and F&B Staff	E mail
2	With Team Members	E mail, Daily Meeting,
3	Issue Reporting	Incident Tracker from Vendor side
4	Sign off from end users	Sign off Format in IT Department
5	User Acceptance Test	UAT Format in IT Department
6	With Head of Clinical Nutrition	Monthly meeting

Risk and Mitigation Plan

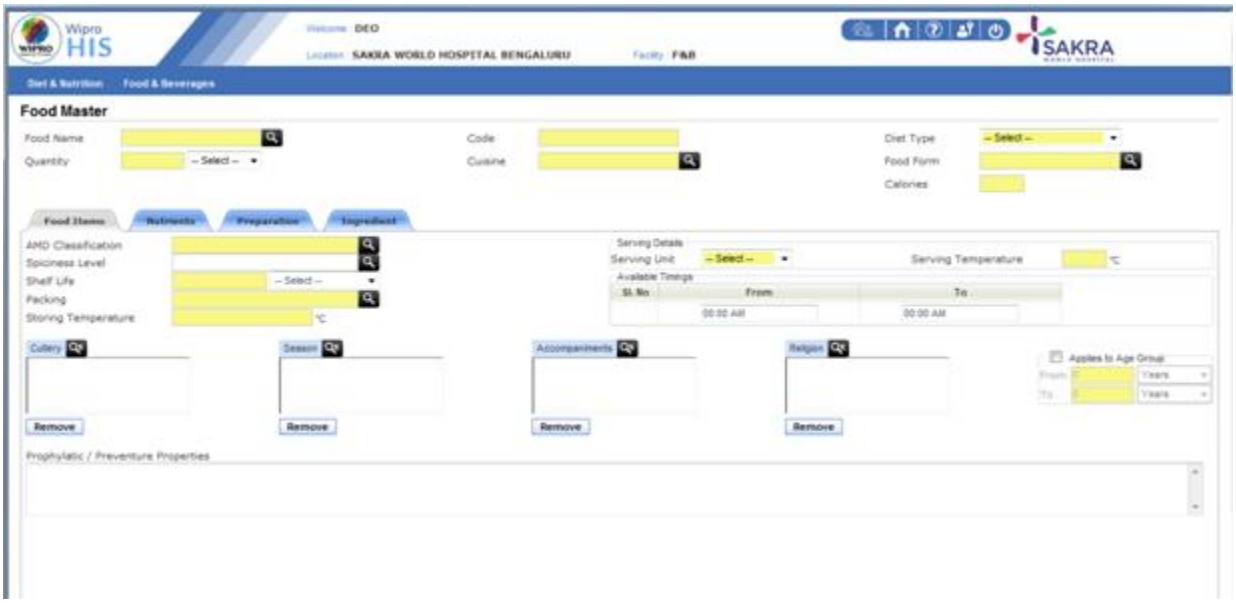
Risk	Impact	Mitigation Plan
Delay in Master data preparation, finalization, validation and entry	Delay in project Go Live	IT team must monitor the progress on Daily basis and take corrective action
Delay in end user training due to non-availability of users or attendance issue	Delay in project go live because of insufficient training	Ensuring end users are trained to ready for go live
Changes coming up during solution mapping or while implementation	Delay in activity which may lead to delay in project go live	To ensure that alternatives/ workarounds are suggested wherever applicable and mapping the critical requirement to customization points to implement later

Go Live Plan

Sl. No.	Activity	Date
1	Go live in CTVS Adult	30th April 2015
2	Go live in MICU	4th May 2015
3	Go live in C wing 5th floor	5th May 2015
4	Go live in CCU & D wing 5th Floor	6th May 2015
5	Go live in A wing 4th floor	11th May 2015

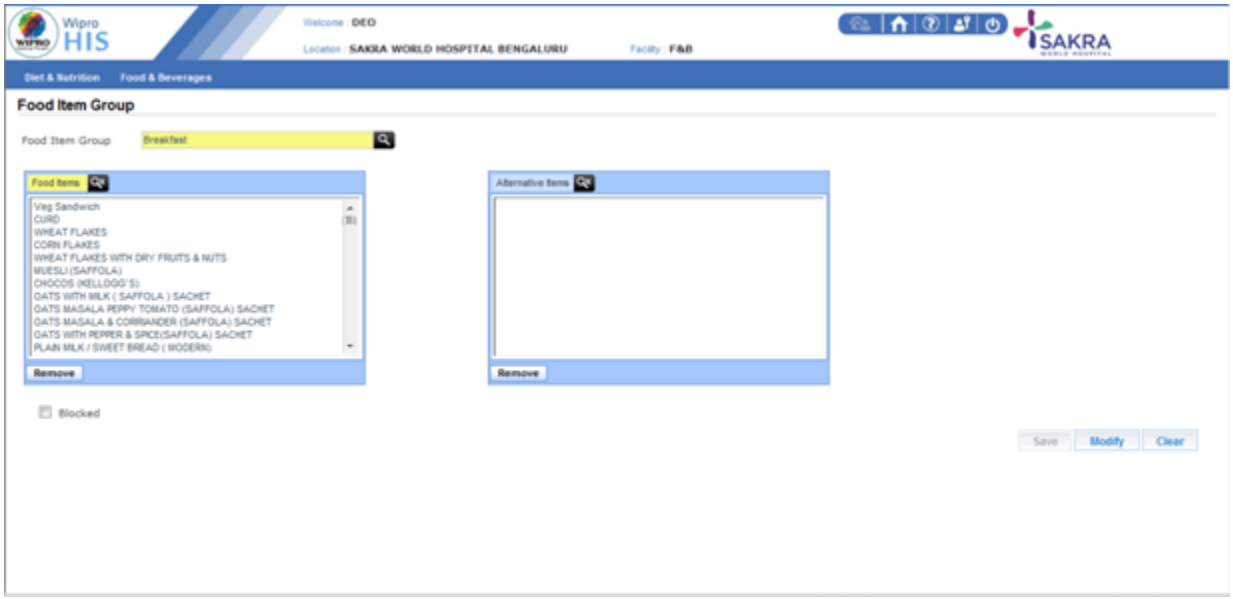
Screen Shots of the Clinical Nutrition Module:

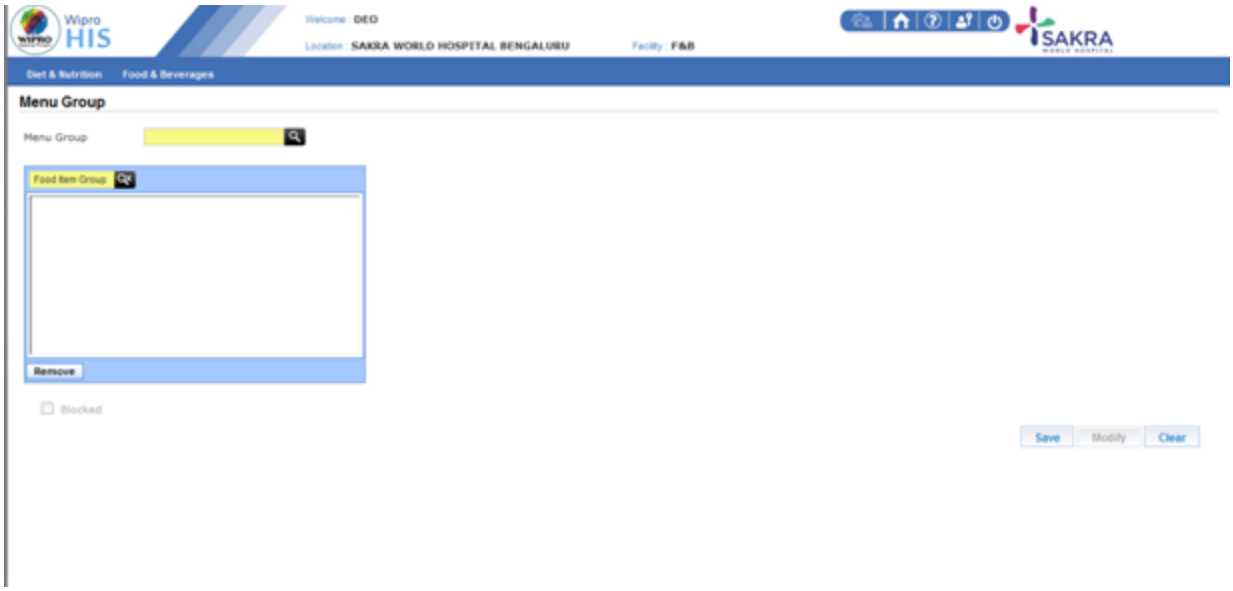
Accessing Food Master Module



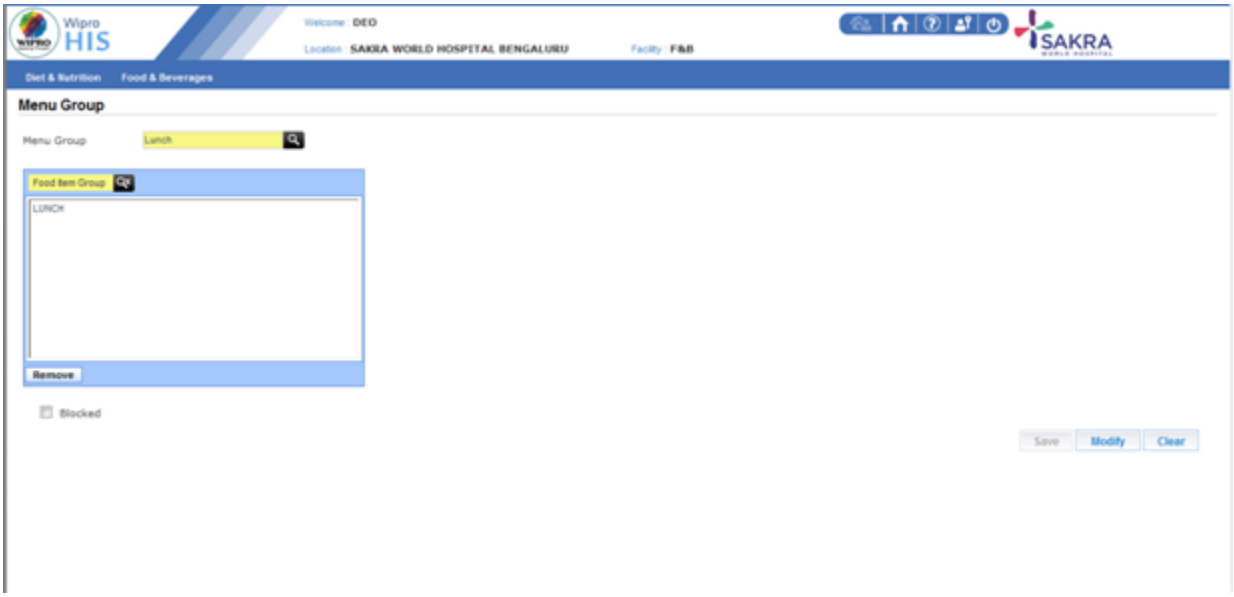
Food Master: Food items are created

Food Item Group: In food item Group, food items are mapped in Food Item Group

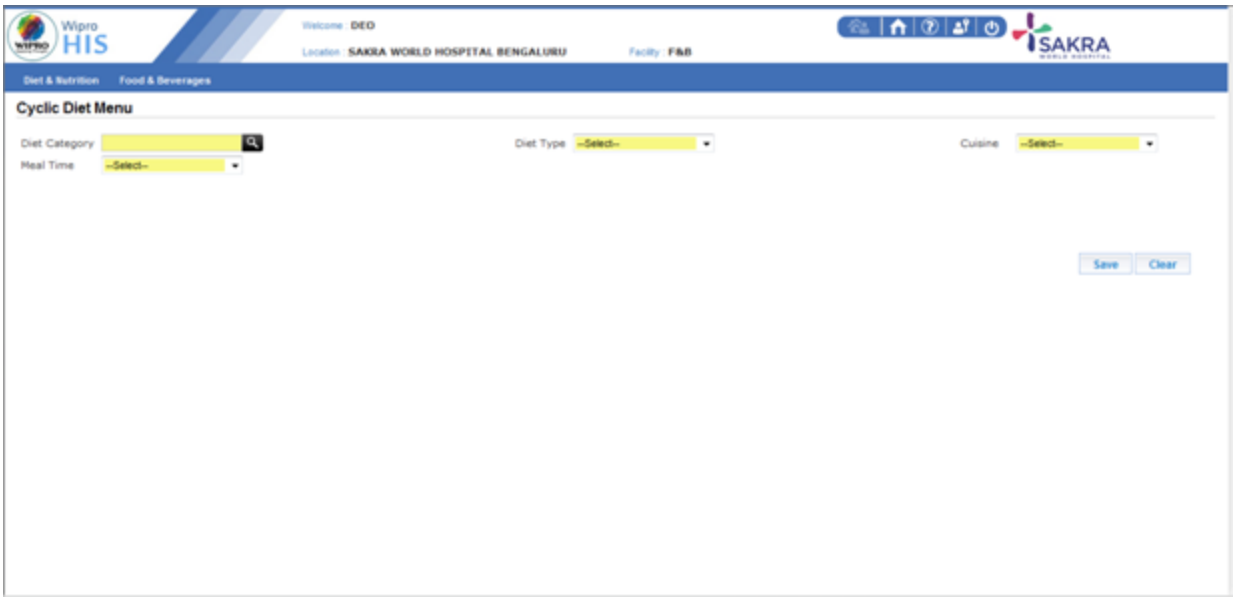




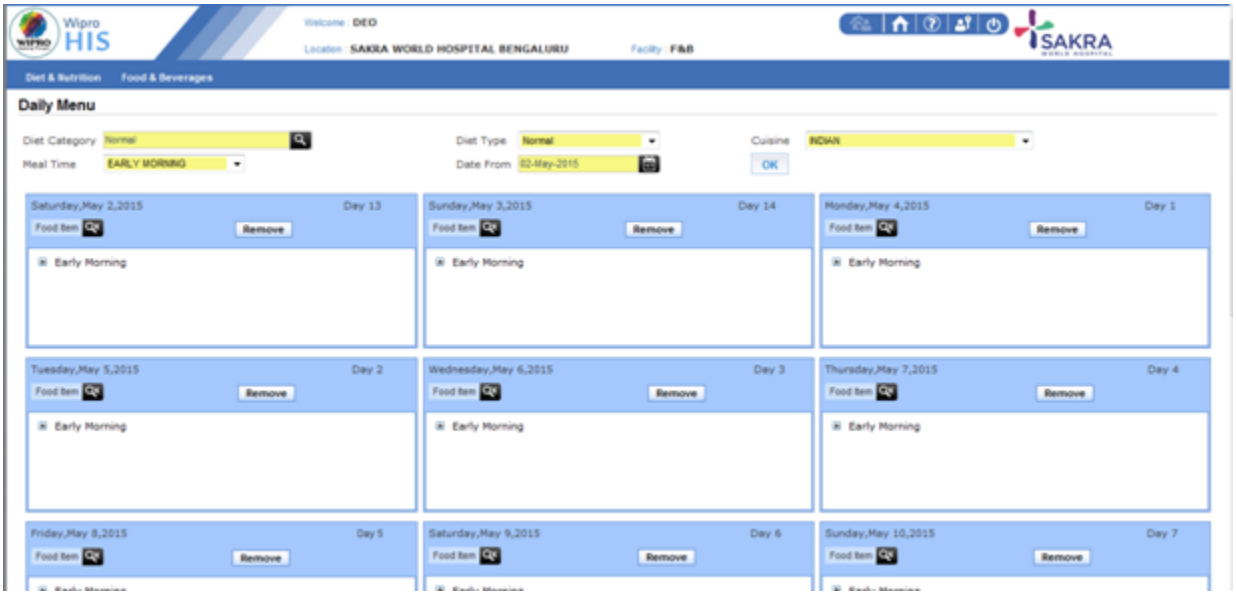
Menu Group: In Menu group Food item group is Mapped



Menu Group: In Menu group Food item group is mapped



Cyclic Diet Menu: In Cyclic Diet menu, Each Diet Category is mapped for each meal time.

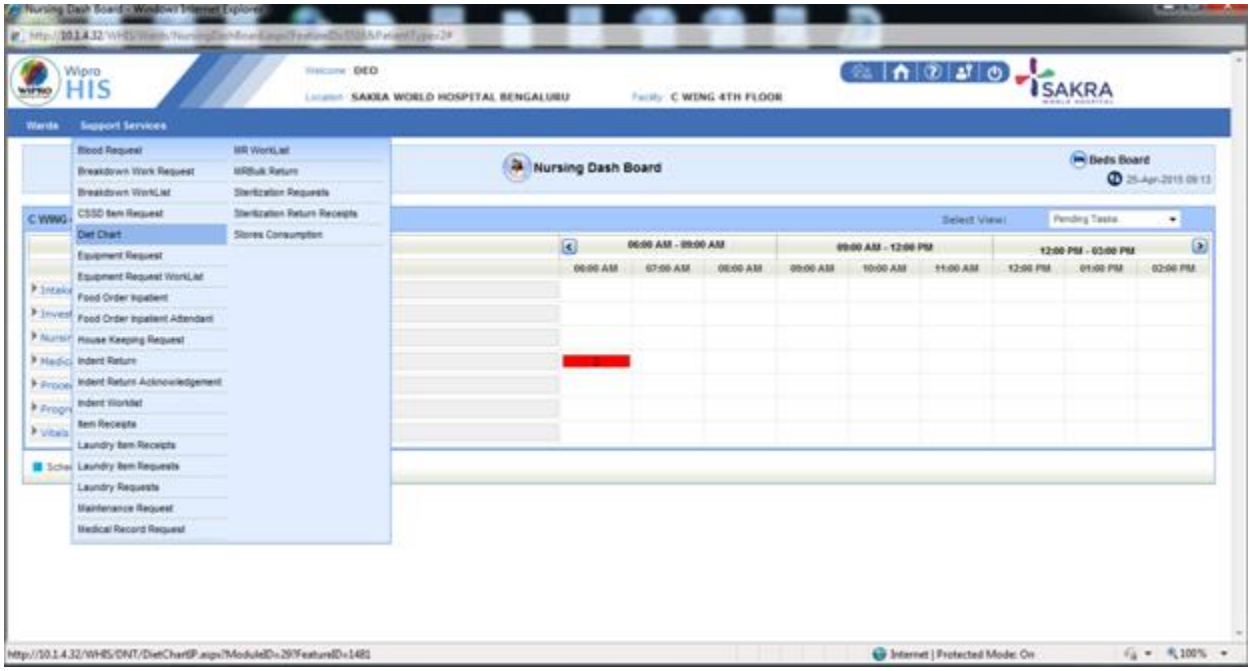


Daily Menu: In daily Menu, Each Food item is mapped for each diet category and Meal time

User Manual - Nurse

Login screen where user need to key in username, password and select location

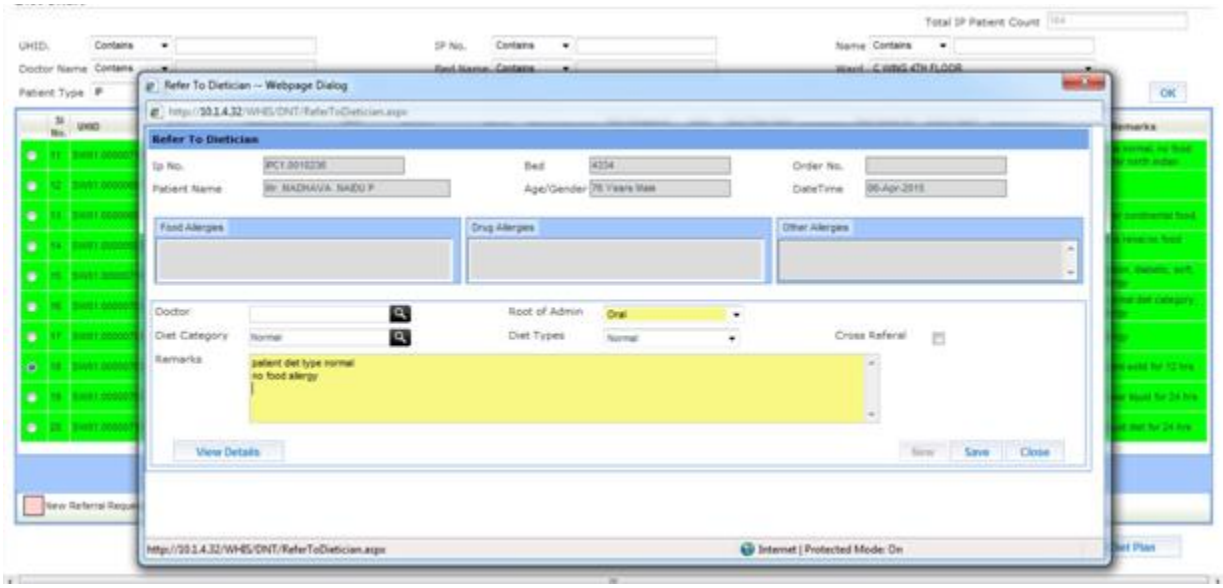
User will select the ward. Then will select support services from clinical system



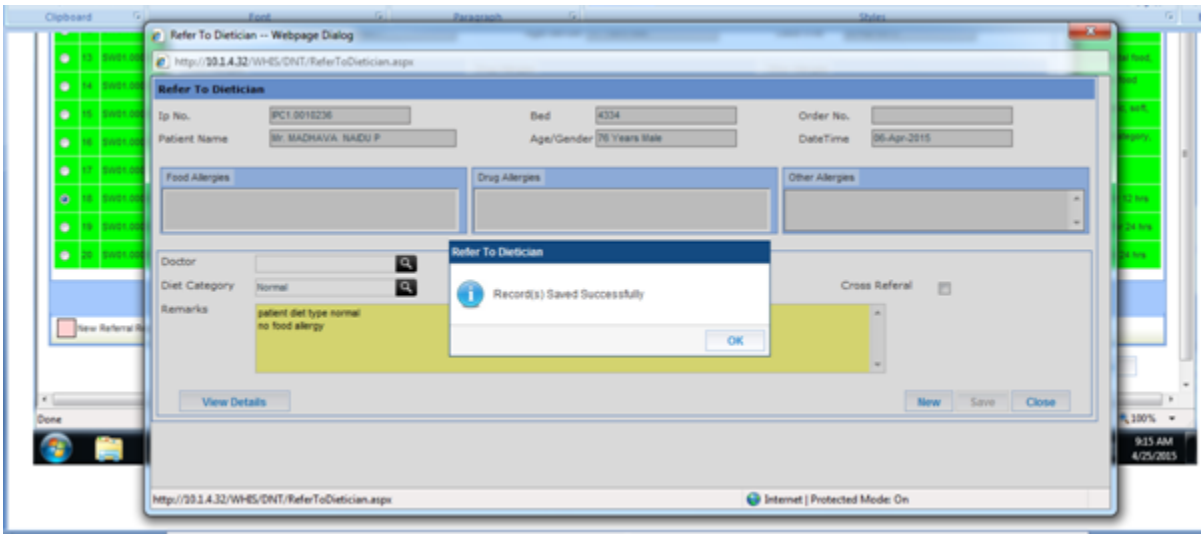
User need to select Diet Chart from Support Services

A screen with Patient list will come. The patient will appear in Pink colour for new admission and for a new Diet referral. The patient with green colour implies that it has planned Diet.

User need to select the patient and then click on “refer” for refering the patient



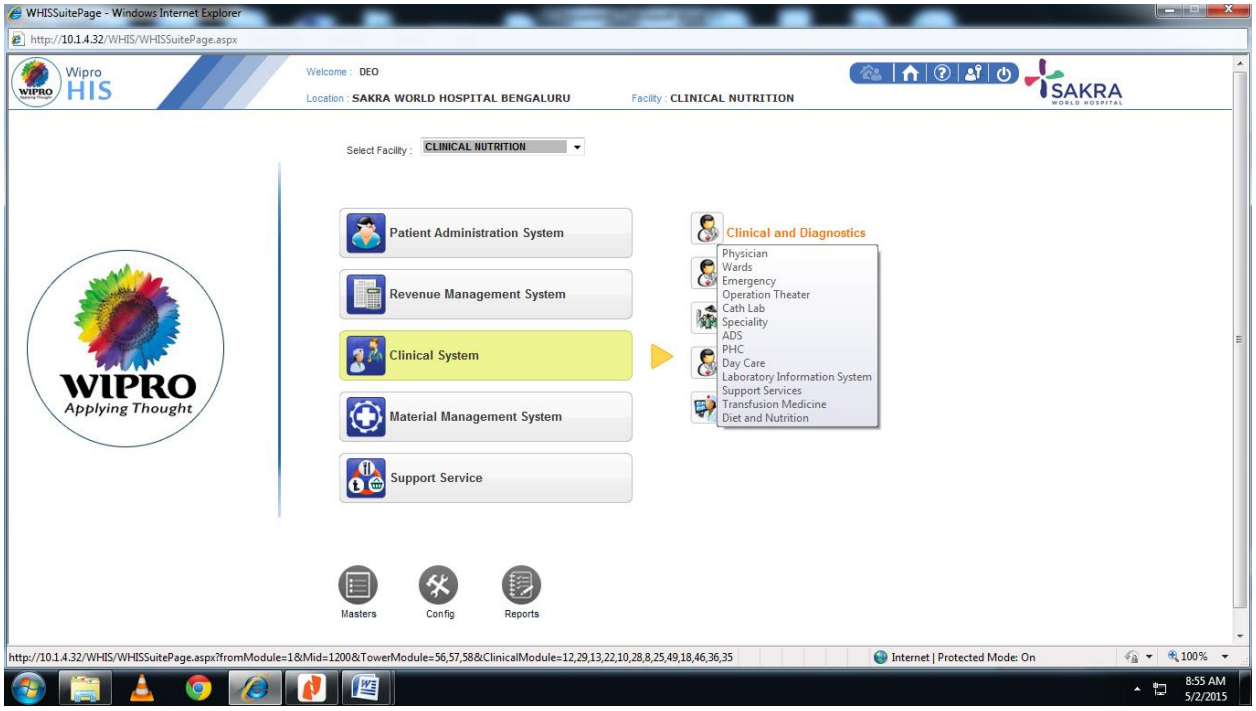
User need to select Route of administration, Diet Category, Diet Type and key in remarks and click on save button (yellow fields are mandatory fields)



On saving, it will turn Pink

User Manual - Dietician

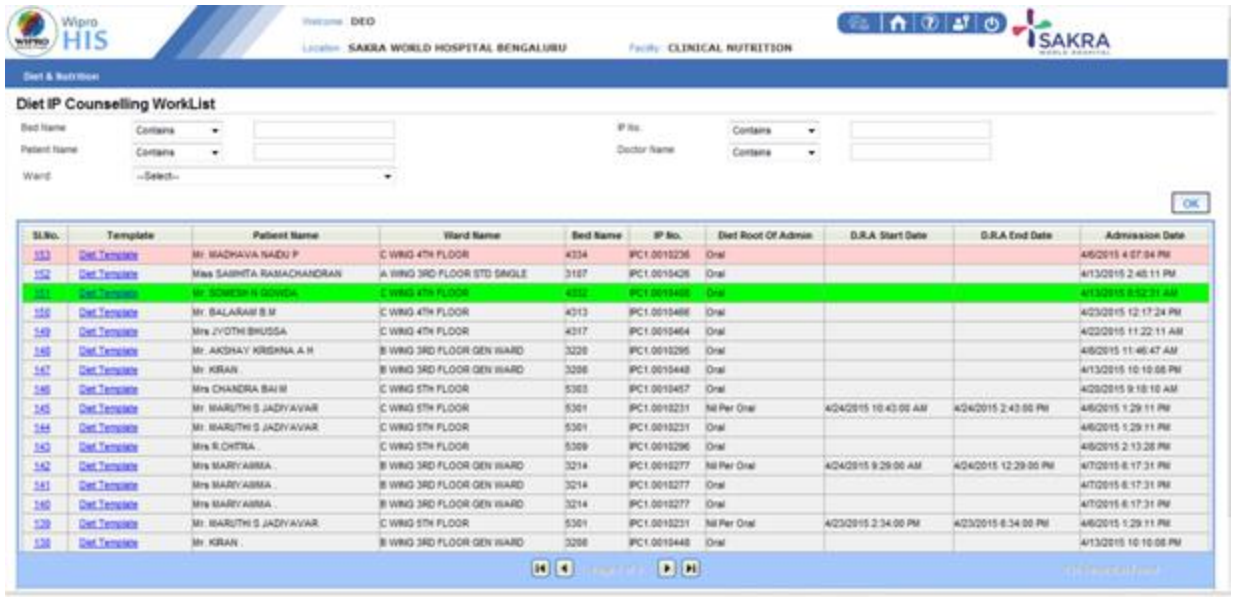
Login screen where user need to key in username, password and select location



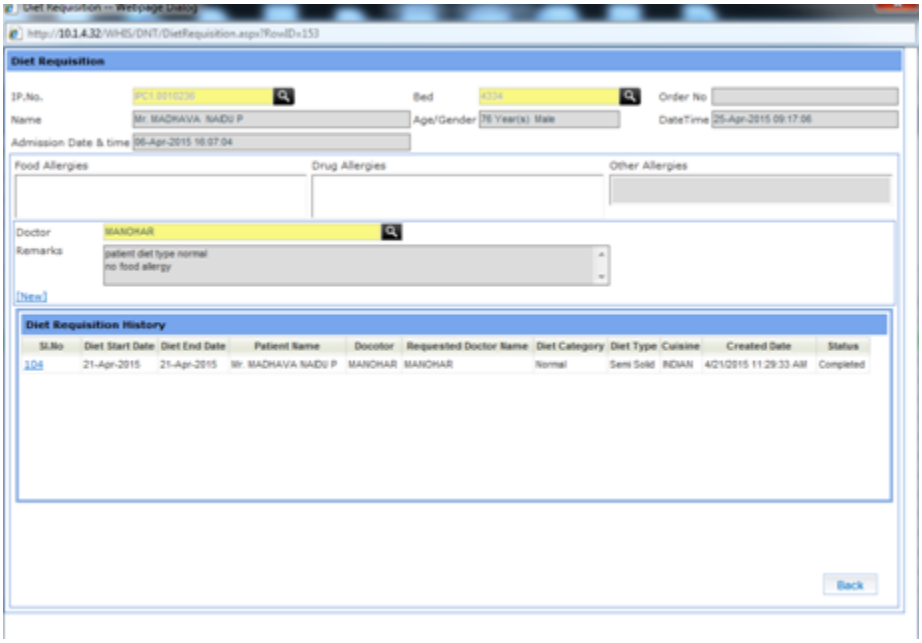
User will select the facility(Here user will select Clinical Nutrition from the drop down). Then will select support services from clinical system

User need to select “Diet IP Consulting Work list” from Diet & Nutrition

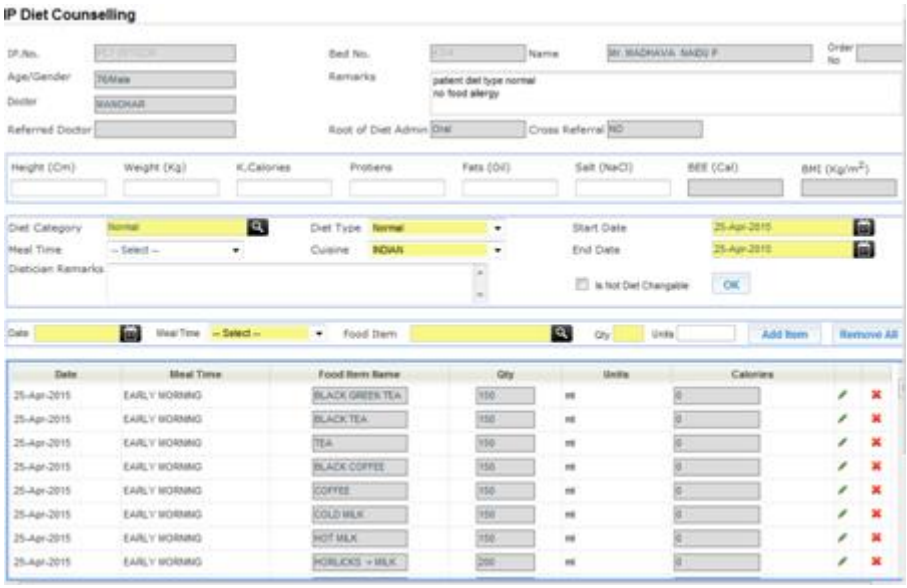
Pink Colour means New Referral, White means unplanned diet, Green means planned diet



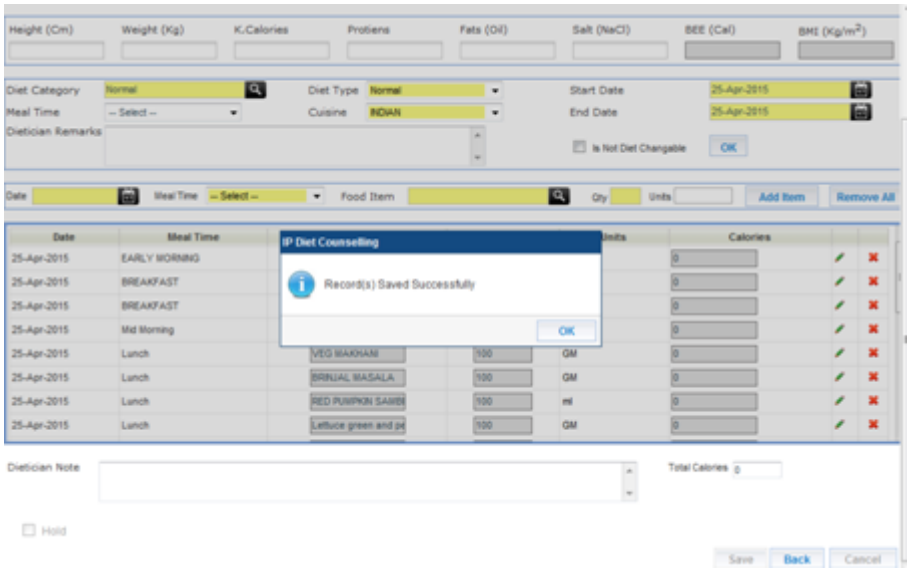
User needs to select the patient



On selecting the patient, Diet requisition screen opens up

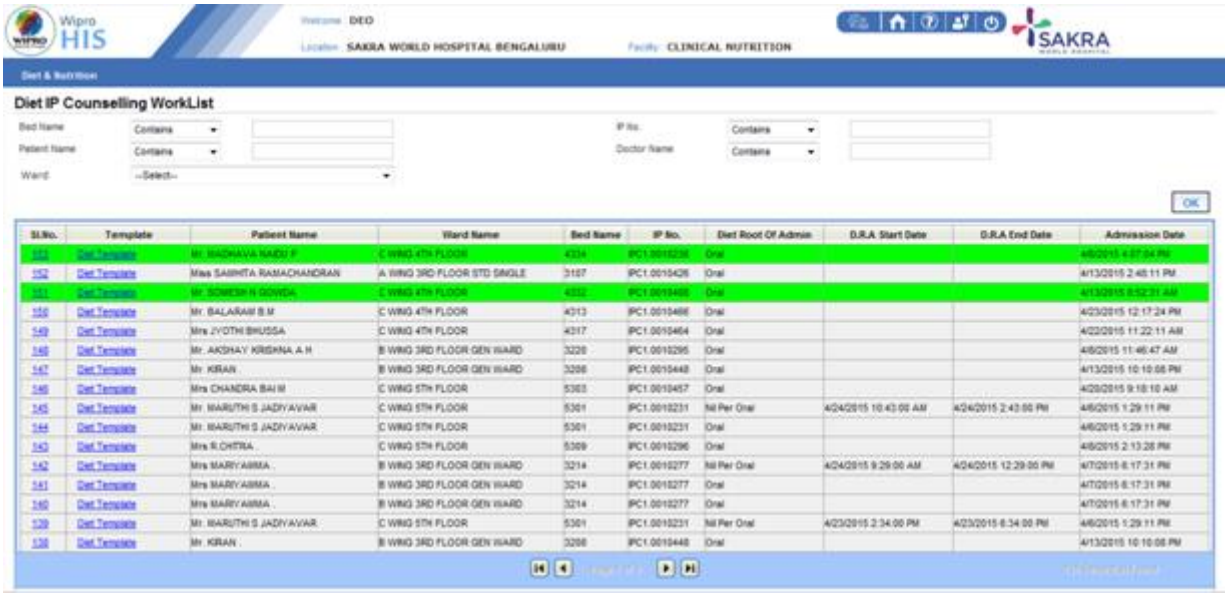


User need to delete the items which are not a part of patient's menu and then "Save"



IP Diet Counselling Successfully saved message dialog box

After planning the colour changes to Green

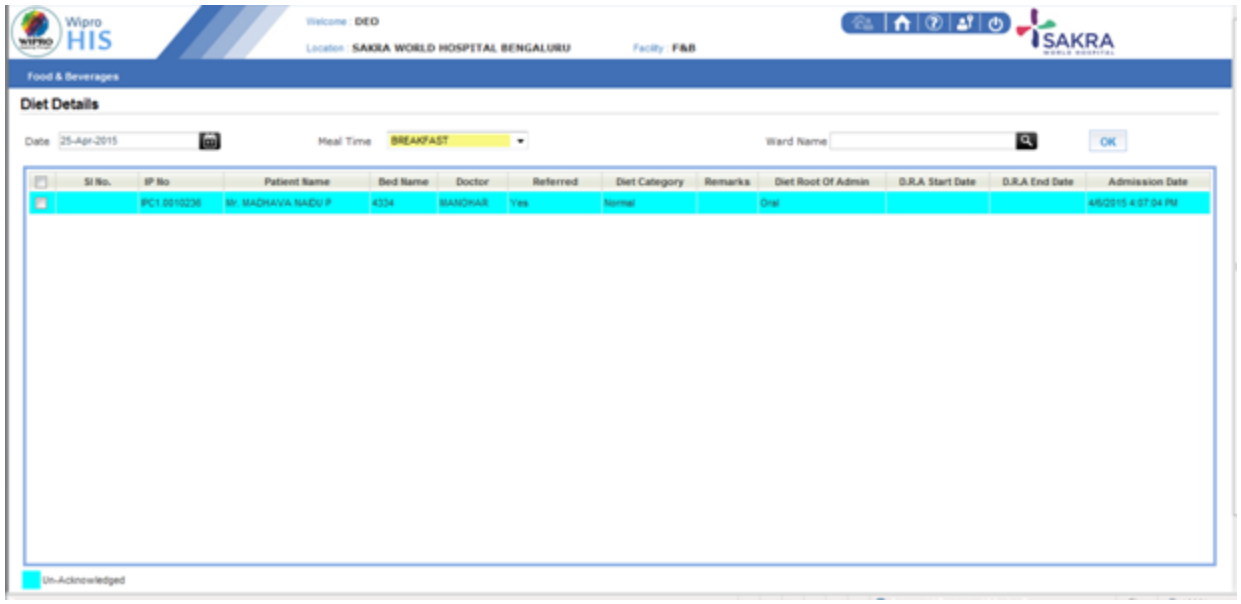


User Manual – F&B Staffs

Login screen where user need to key in username, password and select location

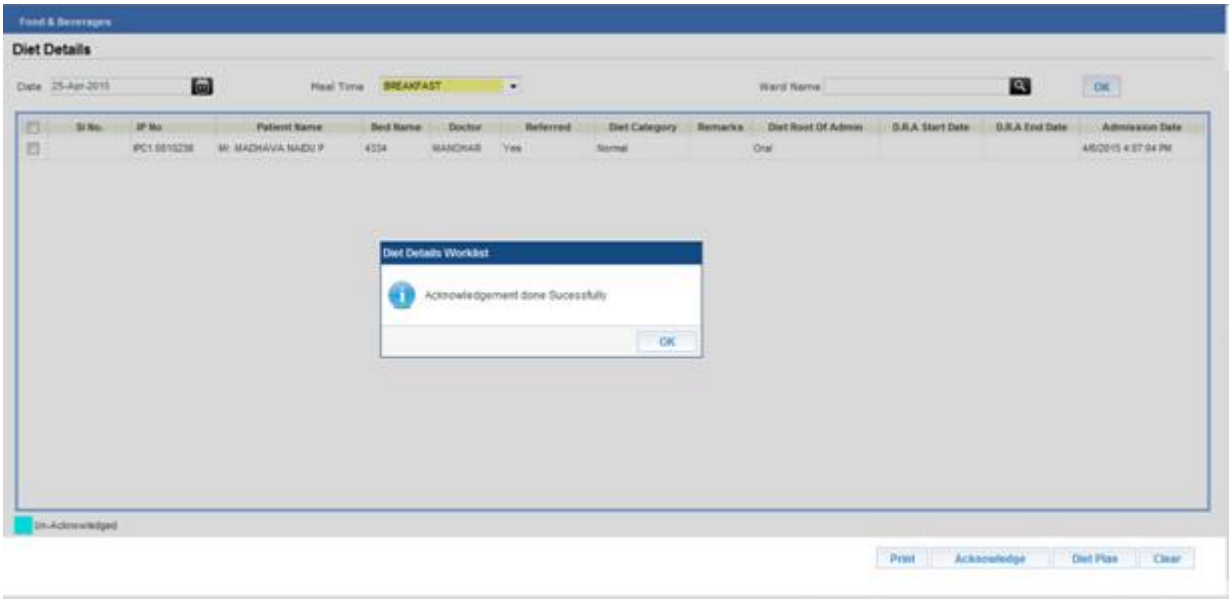
User will select the facility(Here user will select F&B from the drop down). Then will select Food And Beverages from Support Services

User need to select “Diet Details Work list” from Food & Beverages



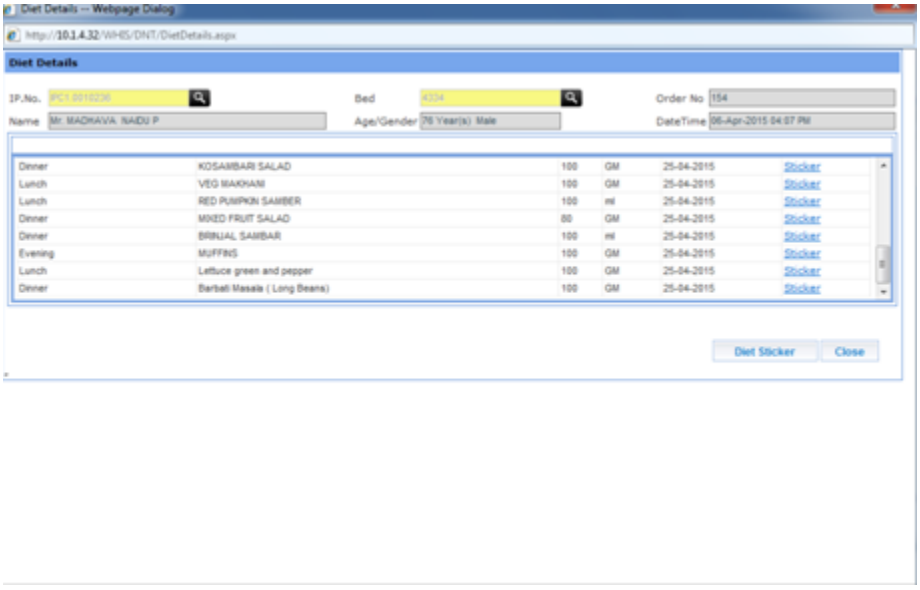
User needs to acknowledge the patient in the list.

Green Colour represents unacknowledged order. After acknowledging the green colour turns to white



"Acknowledgement done successfully" message dialog

Diet Plan of the patient



Diet Ticket of Patient: Diet ticket print out is taken for each patient. Diet ticket consist of patients IP No, Name, Age, Gender, Diet Category, Diet Type, Cuisine, Food Allergy, remarks by dietician.

Reporting Page – Clinical Nutrition Module is also capable of reporting which will help the managers to view daily/ weekly/ monthly report of their department. The module was capable of generating the following standard report.

1. Patient wise Diet Reports
2. Ward wise diet reports
3. Total Diet Summary
4. Ward Wise diet Summary
5. Liquid Diet report
6. Diet preparation Summary
7. Diet Dispatch summary ward wise

Part 2: Project Report

Background of project

A healthy diet, nutritional well-being, and a safe nutritious food supply are essential contributors to a healthy, productive population [1]. In hospital, the clinical nutrition department strives to meet the therapeutic nutritional needs of the patients by complying with physician orders. The aim of hospital is to give complete health. The nutritionist plans food menu for each patient according to clinical needs and the plan prepared by the dietician will go to F&B. F&B will dispatch food accordingly to respective patient. The patient will satisfied only when correct food reaches to them. For this process, nurses, dietician and F&B staff strives for the smooth functioning. For patient satisfaction all staffs has to ensure that right food is reaching to right patient at right time.

The manual process done by users was time consuming and error prone. The process starts when nurse call dietician when new patient arrives in the ward, Nurse will call dietician. Dietician will go to respective wards. Doctor will write the diet that has to follow by patient in case sheet. First dietician will write down the diet prescribed by patient. Then she will take print out of patients in the wards from the HIS. The dietician will go to each patient for rounds where she will fill the clinical assessment form, individual diet preferences etc. Then she will go to prepare the diet plan for the patients in Microsoft Excel in a daily basis. She will take print out and give that to Food & beverages. The F&B dietician will supervise the diet sending food to the respective patient. There are many non-value added services in the workflow.

The delivery of high quality nutritional care to patients becomes very difficult due to too many activities. In manual process there are chances of errors because they are manually entering data. Dietician has to prepare every day diet plan for the patients. In most cases this is very time consuming and become difficult when there is shortage of nutritionist.

So by implementing the clinical nutrition module along with F&B module, the process will be streamlined by reducing errors and also the quality of nutritional care, efficiency of data collection, elimination of calculation errors and data loss, decrease in time spent for dietitians and F&B staffs in comparison with the manual methods used for the preparation of dietary prescriptions [2]. There is easy communication with all the staffs who were involved in the process.

The project is implementing clinical nutrition module along with food and beverage module in hospital. The main aim of implementing the module is streamlining the operations of both departments thereby giving satisfaction to patients. Before implementing the module the process was done manually where there is lot of duplicity and time consuming. By implementing the module the operations become more efficient and effective. Satisfaction is a person's feeling or attitude towards a variety of factors affecting that situation[2] . End user satisfaction is significant for a successful implementation of Clinical nutrition module. End user satisfaction is conceptualized as "the affective attitude towards a specific computer application by someone who interacts with the application directly". End user is defined as " individuals who interact directly with computer"[3] . Therefore it is essential for hospital to understand the end user satisfaction towards module. The aim is to study the satisfaction rate among the end users (nurses, nutritionist, F&B Staff) post implementing the module.

Need of the project

After implementing software, we want to understand the satisfaction rate among the end users. End user satisfaction is significant to successful implementation of any information system. So by this project we can conclude after implementing the information system, if the process becomes easier, effective and efficient. So the research questions were

Are nurses satisfied in diet referral?

1. Are nutritionists satisfied in preparing diet Plan for Patients?
2. Are F&B staffs satisfied in module?
3. Are there fewer complaints in Food dispatch?
4. Is there time saving for dieticians post implementation?

General Objective: To study the satisfaction rate of staff members after implementing Clinical Nutrition Module.

Specific Objective:

- To study the satisfaction rate among nurses post implementation
- To study the satisfaction rate among nutritionists post implementation
- To study the satisfaction rate among F&B staffs post implementation

Review of Literature:

1. Assessment Of End User Satisfaction Of Hospital Information System, Dr Rajesh Kumar Sinha, et al

The study was done in a women's hospital in southern India where sample size was 125 which included nursing, front office, administrative, Paramedical, medical staff and account staffs. According to the researchers, HIS assist in carrying out clinical, nursing, administrative and other daily activities. By assessing the satisfaction level of end users in using the system is important to ensure the proper functioning of the system. The study result revealed that the respondents were moderately satisfied with the general and module specific features (Mean score < 4). Issues were identified in many areas, where end users give suggestions and the features changed accordingly and implemented later. After implementation satisfaction rate was increased due to changes. Their major concern was to have regular induction and refresher training and to include their requirements in the HIS to assist them in performing their daily routine tasks effectively. The study result indicated the need to conduct regular and refresher training, and assess the end user need and their interaction with HIS on a regular basis to achieve maximum satisfaction. The study showed that almost all the users were satisfied with overall functionality of the system. Some dissatisfaction was there among users because they were not involved in designing and implementing the system.

2. Pal: A web based dietary menu generating and management system, Noah SA et al states about implementation of computer based dietary menu generation. The main focus of dieticians is mainly to assist healthy individuals calculate their calorie intake and to monitor the selection of menus based on menus. Initial post evaluation among 10 dietitians indicates that they are comfortable with the organization of the modules and information. The system has the potential of enhancing the quality of services with the provision of standard and healthy menu plans and at the same time increasing outreach, particularly to rural areas. With its potential capability of optimizing the time spent by dietitians to plan suitable menus, more quality time could be spent delivering nutrition education to the patients, thereby made dietician comfortable with the diet software.

3. A Survey on the Users' Satisfaction with the Hospital Information Systems (HISs) based on DeLone and McLean's Model in the Medical-Teaching Hospitals in Isfahan City, Sakineh saghaeiannejad-Isfahani et al.

   The user's satisfaction with information system in fact denotes the extent user is satisfied with the system's achievement in fulfilling hi requirements. This study tries to explore the user's satisfaction with hospital information system (HISs) based on DeLone and McLean's Model in the Medical-Teaching Hospitals in Isfahan City. The study was carried in 11 Medical-teaching hospitals in 2009 for assessing the user satisfaction. Sample size is 228. The study shows that the mean scores obtained for satisfaction with different kinds of HIS in use in hospitals were statistically significant. The overall mean score for the satisfaction was 54.6% for different types of systems and 55.6% among the hospitals. The user's satisfaction with information system in fact denotes the extent user is satisfied with the system's achievement in fulfilling hi requirements. This study tries to explore the user's satisfaction with hospital information system(HISs) based on DeLone and McLean's Model in the Medical-Teaching Hospitals in Isfahan City.

4. Is the ICU staff satisfied with the computerized physician order entry? A cross-sectional survey study, Renata Rego Lins Fumis at all

   The study was conducted among 250 Intensive care unit staff to assess the satisfaction rate after implementing Computerized Physician order entry. The objective of the study was to evaluate the satisfaction of the intensive care unit staff with a computerized physician order entry and to compare the concept of the computerized physician order entry relevance among intensive care unit healthcare workers. A cross-sectional survey was conducted to assess the satisfaction of the intensive care unit staff with the computerized physician order entry in a 30-bed medical/surgical adult intensive care unit using a self-administered questionnaire. The questions used for grading satisfaction levels were answered according to a numerical scale that ranged from 1 point (low satisfaction) to 10 points (high satisfaction). The majority of the respondents (n=250) were female (66%) between the ages of 30 and 35 years of age (69%). The overall satisfaction with the computerized physician order entry scored 5.74±2.14

points. The satisfaction was lower among physicians (n=42) than among nurses, nurse technicians, respiratory therapists, clinical pharmacists and diet specialists (4.62±1.79 versus 5.97±2.14, p<0.001); satisfaction decreased with age (p<0.001). Physicians scored lower concerning the potential of the computerized physician order entry for improving patient safety (5.45±2.20 versus 8.09±2.21, p<0.001) and the ease of using the computerized physician order entry (3.83±1.88 versus 6.44±2.31, p<0.001). The characteristics independently associated with satisfaction were the system's user-friendliness, accuracy, capacity to provide clear information, and fast response time. Six months after its implementation, healthcare workers were satisfied, albeit not entirely, with the computerized physician order entry. The overall users' satisfaction with computerized physician order entry was lower among physicians compared to other healthcare professionals. The factors associated with satisfaction included the belief that digitalization decreased the workload and contributed to the intensive care unit quality with a user-friendly and accurate system and that digitalization provided concise information within a reasonable time frame.

5. Measurement of CPOE end user satisfaction among ICU physicians and nurses, P.L.T Hoonakker et al

   Implementation of Computerized Provider Order Entry (CPOE) can fail or meet high levels of user resistance for a variety of reasons, including lack of attention to users' needs and the significant workflow changes induced and required by CPOE. End-user satisfaction is a critical factor in IT implementation. The study was conducted among 120 nurses and 57 physicians in 4 ICU in a large hospital in USA after implementing CPOE. The goal of the study was to identify criteria to select a valid and reliable questionnaire to measure end user satisfaction with CPOE. The method used is end user satisfaction questionnaire. Most of the questionnaires used to measure end-user satisfaction have been tested for reliability and validity and most of the questionnaires have reasonably reliability and some sort of validity. Most of end users respond that they are moderately satisfied with CPOE. According to study, End user satisfaction is “the affective attitude towards a specific computer application by someone who interacts with the application directly. The ICU physician and nurses in the study rated the following CPOE Characteristics as positive: the mean for getting help when having problems is 5.12 and reliability of technology is 4.56. In their study the result shows significantly higher scores on different aspects of user satisfaction.

Research Methodology:

Study Area: Study was performed in a 150 bedded hospital of Wards, Clinical Nutrition and Food & beverages Department in the hospital

Research Approach: Quantitative Approach

Study design: Descriptive Cross Sectional Study

Study population: 55 staff members including nurses, nutritionist, F&b staff

Sampling Method: Convenient Sampling

Expected Outcome: Satisfaction rate among staff members after implementing the Clinical nutrition and F&B Module

Time Frame- 20th February 2015 to 19th May 2015.

Data Collection Method: Structured Questionnaire on 5 Point Likert Scale from Strongly Agree to Strongly Disagree (Score 5-1) was used to collect data. Each point on the scale carries a score. Strongly Disagree was given least score (1), Disagree (2), Neutral (3), Agree(4), Strongly Agree (5). Each set of Questionnaire Consist of 8 aspects regarding the software. The questionnaire was administered to the respondents after briefing them about the project and taking consent from them.

Data Sources:

Primary Data Source: Structured Questionnaire

Analysis of data: Data analysis is done with the help of Statistical Package for Social Science (SPSS)

Limitation of study:

Small sample size- 45 staffs were taken as sample size

No review of Literature is available for comparing the research study.

Result and Discussion:

The assessment of end user satisfaction was conducted among 40 staffs of three departments. In research after data collection, it has to be processed and analysed. All the data collected were transferred in SPSS.16 for analysis.

The result obtained is presented in tables:

Table (7) Characteristics of Respondents (Nutritionists) N=5

	Frequency	Percentage
Gender Wise Distribution		
Male	0	0
Female	5	100%
Age Wise Distribution		
21-30 years	3	60%
31-40 years	2	40%
41-50 years	0	0
Above 51 years	0	0
Qualification		
Diploma	0	0
Graduate	0	0
Post Graduate	5	100%
Doctorate	0	0
Designation		
Senior Nutritionists	2	40%
Dietician	3	60%
Clinical Experience		
Below 1 year	1	20%
1-3 year	2	40%
3-7 year	0	0
Above 7year	2	40%

- Gender

  The respondents were asked to enter the gender

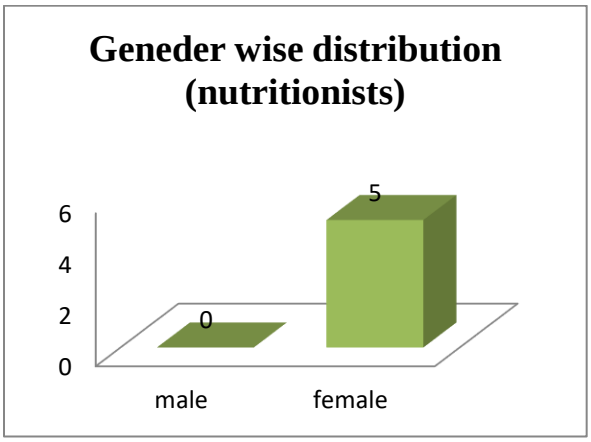


Figure (8) Graph showing Gender Distribution among Nutritionists

- Age Group

  The respondents were asked to enter the age group. Based on the data entered the age was grouped into two categories. There was no nutritionists who belonged to other two age groups.

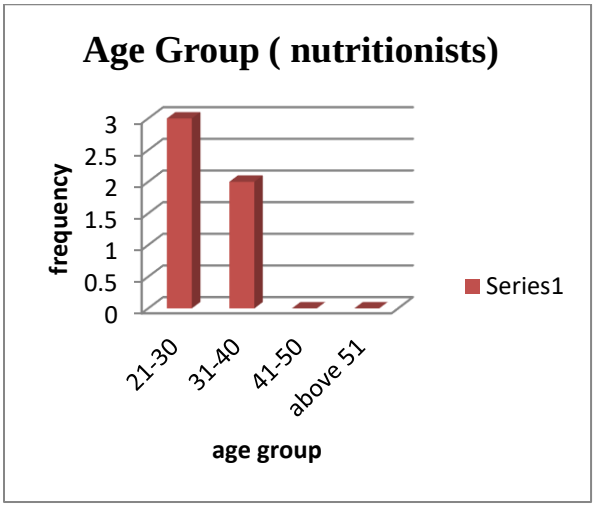


Figure (9) Graph showing Age Group Distribution among Nutritionists

- Qualification

  The respondents were asked to enter the qualification. All the respondents were post graduates.

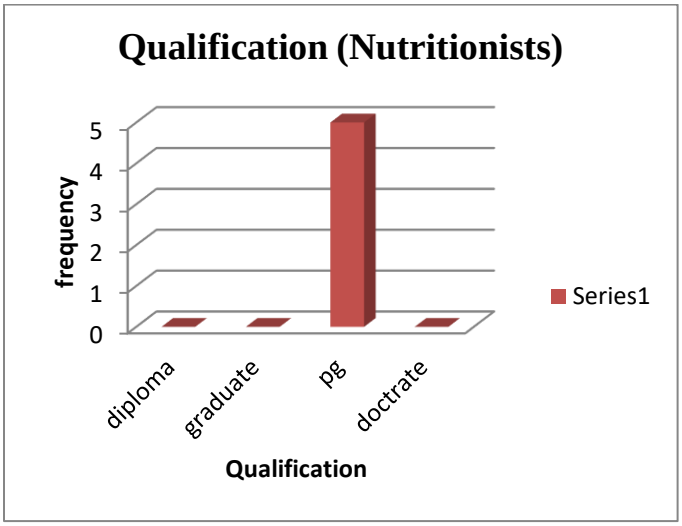


Figure (10) Graph showing Qualification among Nutritionists

- Clinical Experience

  The respondents were asked to enter the clinical experience.

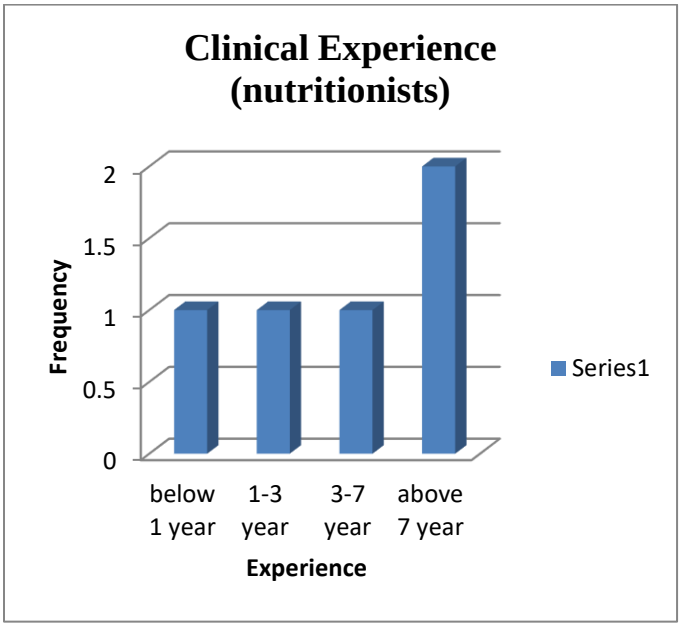


Figure (11) Graph showing Clinical experience among Nutritionists

Table (8) Response related to factors of the Module

Sl. No	Factor	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean
1	Module is User friendly	**0 (0%)**	**1 (20%)**	**1 (20%)**	**1 (20%)**	**2 (40%)**	**2.2**
2	Reduction in paperwork/manual process	**0 (0%)**	**1 (20%)**	**1 (20%)**	**3 (60%)**	**0 (0%)**	**2.6**
3	Reduction in total time taken to plan the diet	**0 (0%)**	**1 (20%)**	**1 (20%)**	**1 (20%)**	**2 (40%)**	**2.2**
4	Easy communication with F&B	**0 (0%)**	**2 (40%)**	**2 (40%)**	**0 (0%)**	**1 (20%)**	**3**
5	Able to track full diet plan and diet changes of patients	**1 (20%)**	**2 (40%)**	**1 (20%)**	**0 (0%)**	**1 (20%)**	**3.4**
6	Diet plan can be made easily	**0 (0%)**	**2 (40%)**	**1 (20%)**	**1 (20%)**	**1 (20%)**	**2.8**
7	Post implementation increases productivity	**1 (20%)**	**0 (0%)**	**1 (20%)**	**3 (60%)**	**0 (0%)**	**2.8**
8	I am satisfied with using Clinical nutrition module	**1 (20%)**	**2 (40%)**	**1 (20%)**	**1 (20%)**	**0 (0%)**	**2.6**
9	Require Enhancement/Modification in Module	**4 (80%)**	**1 (20%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**4.8**

- Module is User friendly

  Out of 5 respondents, 2 (40%) respondents strongly disagree with the attribute that module is user friendly. The Mean is 2.2 indicates that nutritionists are not satisfied with the user friendliness of module.

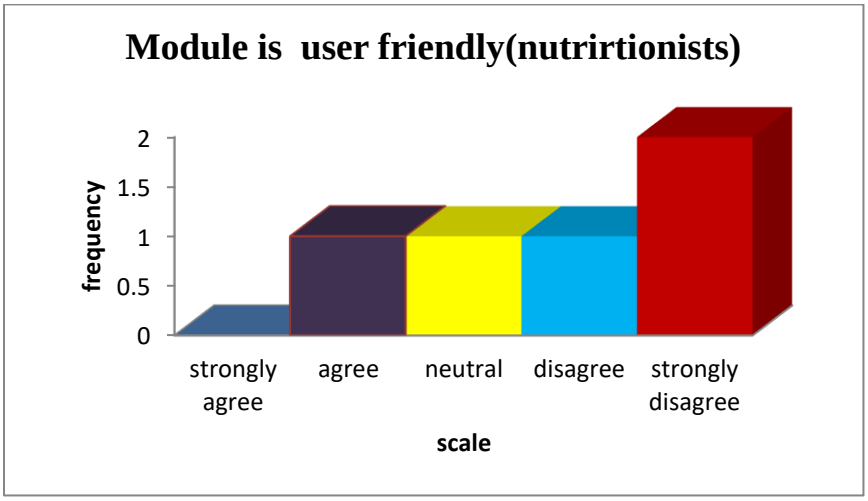


Figure (12) Graph showing Module is User friendly among Nutritionists

- Reduction in paperwork/manual process

  Out of 5 respondents, 3 (60%) respondents disagree that post implementation there is reduction in manual process. The mean is 2.6 indicates that the nutritionists have neutral behaviour regarding this factor.

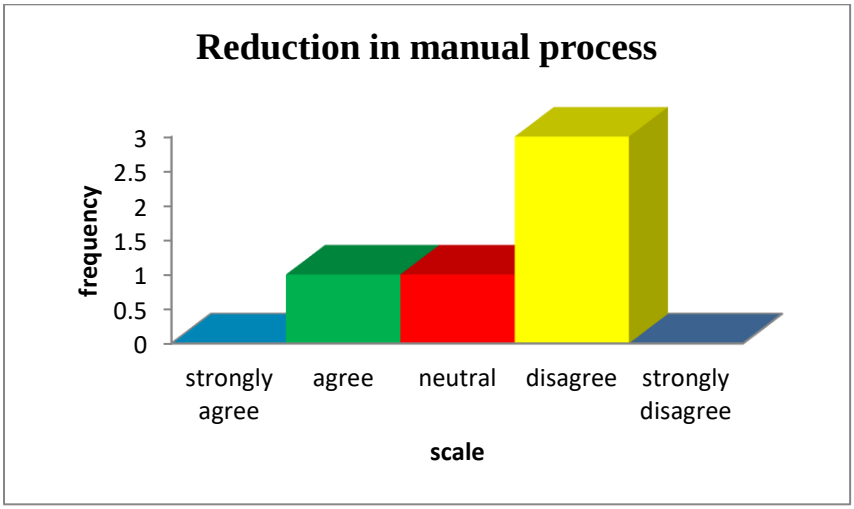


Figure (13) Graph showing Reduction in manual process among Nutritionists

- Reduction in total time taken to plan the diet

  Out of 5 respondents, 2 (40%) strongly disagree that there is time reduction to plan a diet. The mean is 2.2 indicates that post implementation there is no reduction in time taken to plan the diet. They completely disagree with this factor.

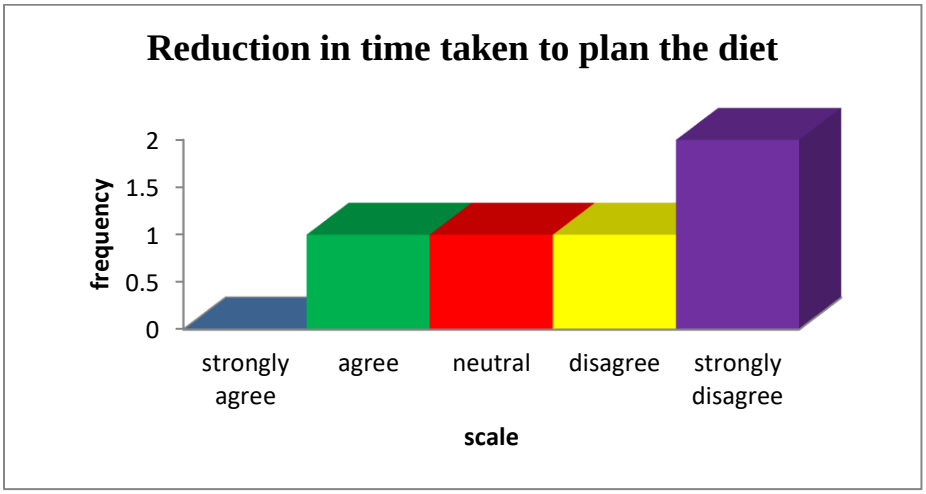


Figure (14) Graph showing Reduction in total time taken to plan the diet among Nutritionists

- Easy communication with F&B

  Out of 5 respondents, 2(40%) respondents agree that there is easy communication with F&B, and 2(40%) respondents were neutral. The mean is 3 indicates that the staff were in neutral about this factor. They are moderately satisfied with the module.

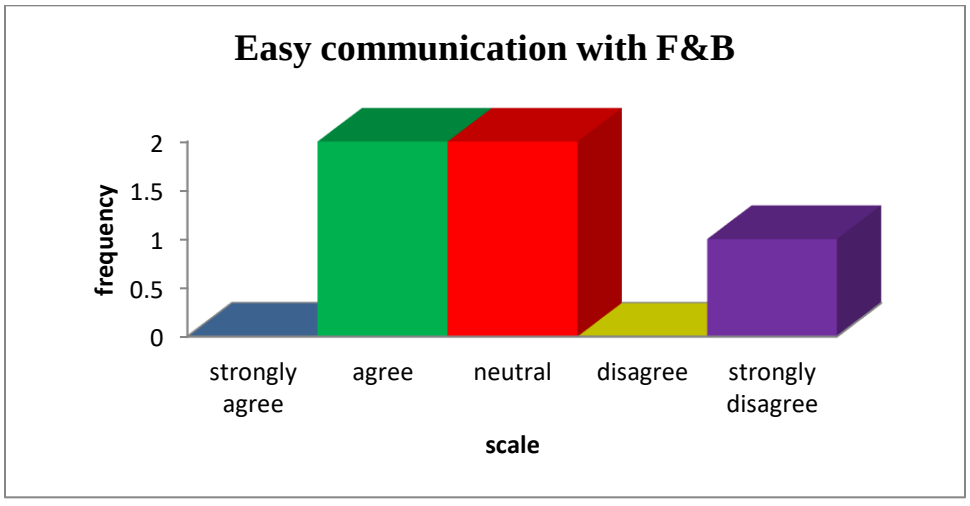


Figure (15) Graph showing Easy communication with F&B among Nutritionists

- Able to track full diet plan and diet changes of patients

  Out of 5 respondents, 2(40%) respondents agree that post implementation the software can able to track the full diet plan and diet changes of patients. The mean is 3.4 indicates that staffs are moderately satisfied with the module.

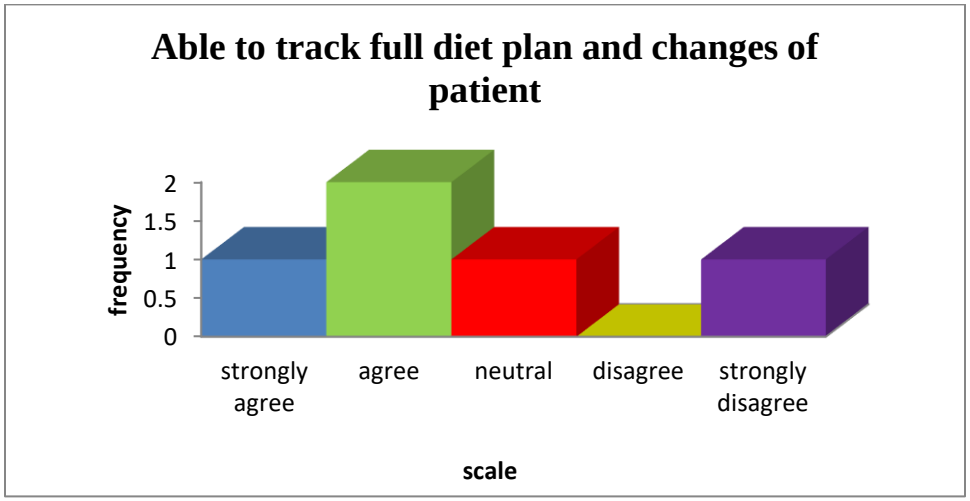


Figure (16) Graph showing track full diet plan and changes of patients among Nutritionists

- Diet plan can be made easily

  Out of 5 respondents, 2(40%) respondents agree that diet plan can be made easily. The other 3 respondents scored it as neutral, disagree, and strongly disagree respectively. The mean is 2.8 indicates that they disagree with the factor

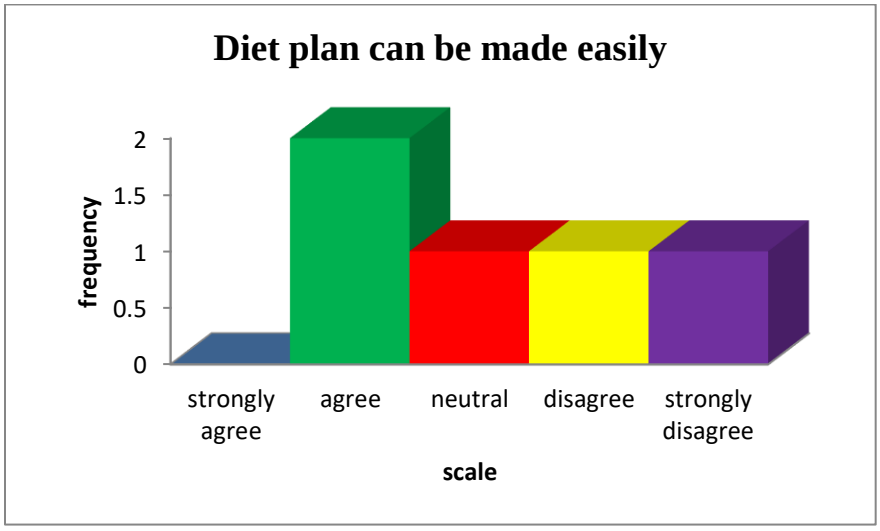


Figure (17) Graph showing Diet plan can be made easily among Nutritionists

- Post implementation increases productivity

  Out of 5 respondents, 3(60%) respondents disagree that post implementation increases productivity. The other responses were strongly agree and neutral. The mean is 2.8 indicates that they had neutral response with this factor.

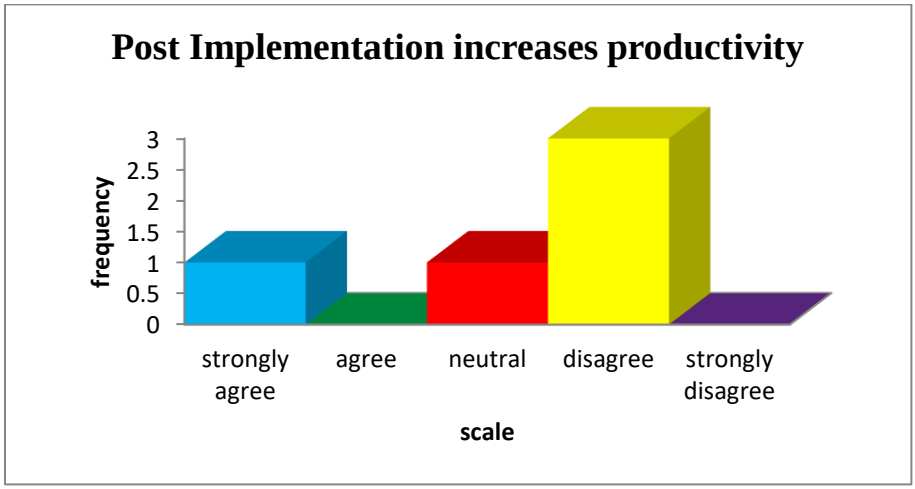


Figure (18) Graph showing Post implementation increases productivity among Nutritionists

- I am satisfied with using Clinical nutrition module

  Out of 5 respondents, 2 respondents agree that they were satisfied with the module. The other responses were strongly agreed, neutral and disagree. The mean is 2.6 indicates that they had neutral response with the factor.

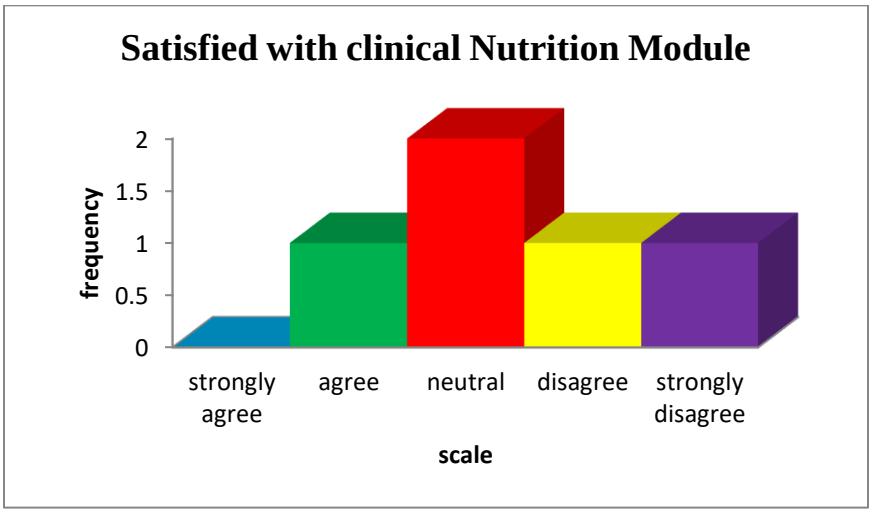


Figure (19) Graph showing satisfied with using Clinical nutrition module among Nutritionists

- Require Enhancement/Modification in Module

  Out of 5 respondents, 4 respondents strongly agree that module require modifications. The mean is 4.8 indicates that they require modifications

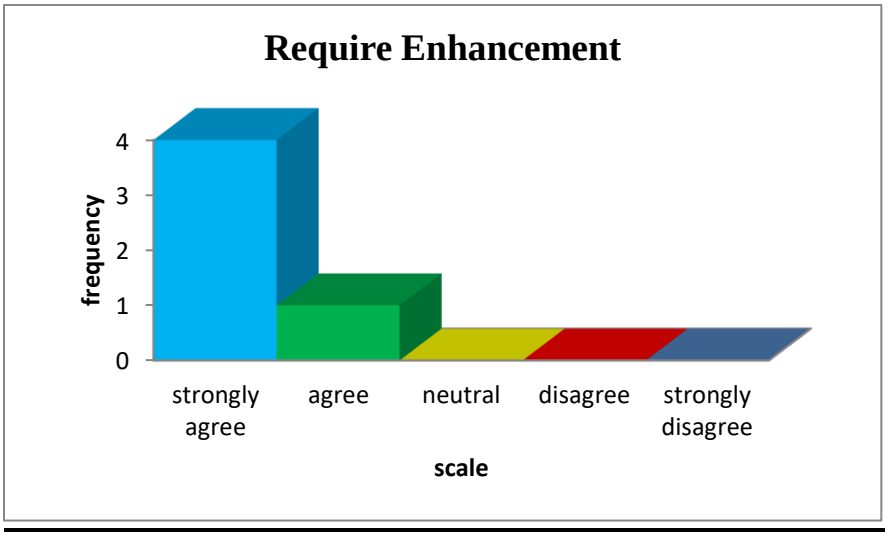


Figure (20) Graph showing Require Enhancement/Modification in Module among Nutritionists

Table (9) Characteristics of Respondents (Nurses) (N=40)

	Frequency	Percentage
Gender Wise Distribution		
Male	15	37.5%
Female	25	62.5%
Age Wise Distribution		
21-30 years	31	77.5%
31-40 years	9	22.5%
41-50 years	0	
Above 51 years	0	
Qualification		
Diploma	16	40%
Graduate	18	45%
Post Graduate	6	15%
Doctorate	0	0
Designation		
Senior Staff Nurse	26	65%
Head Nurse	8	20%
Staff Nurse	6	15%
Clinical Experience		
Below 1 year	10	25%
1-3 year	9	22.5%
3-7 year	12	30%
Above 7year	9	22.5%

- Gender

The respondents were asked to enter the gender

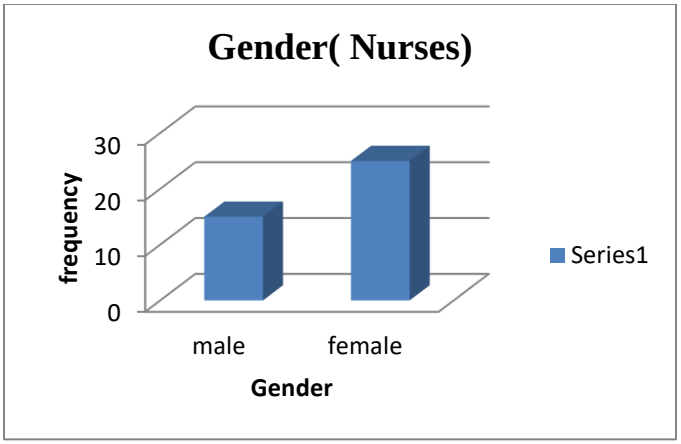


Figure (21) Graph showing Gender Distribution among Nurses

- Age Group

The respondents were asked to enter the age group. Based on the data entered the age was grouped into two categories. There was no nurse who belonged to other two age groups.

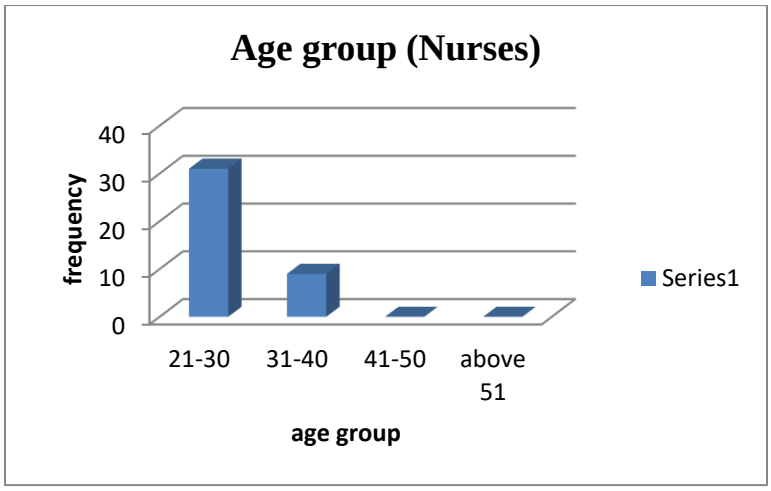


Figure (22) Graph showing Age group Distribution among Nurses

- Qualification

  The respondents were asked to enter the qualification. The respondent's qualifications were diploma, graduate and post graduates.

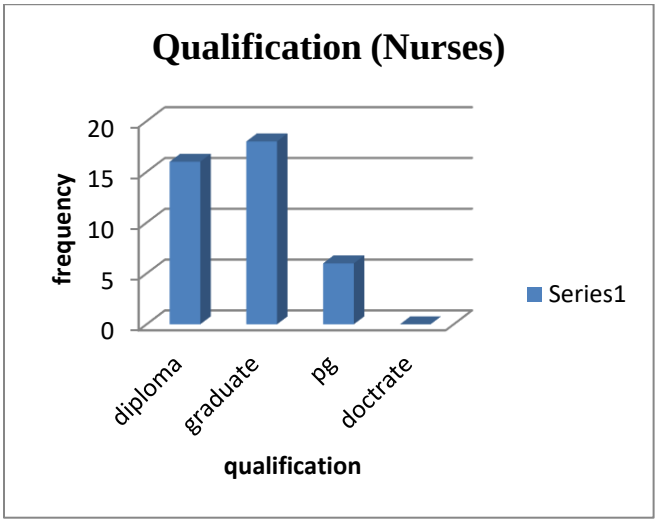


Figure (23) Graph showing Qualification among Nurses

- Clinical Experience

  The respondents were asked to enter the clinical experience.

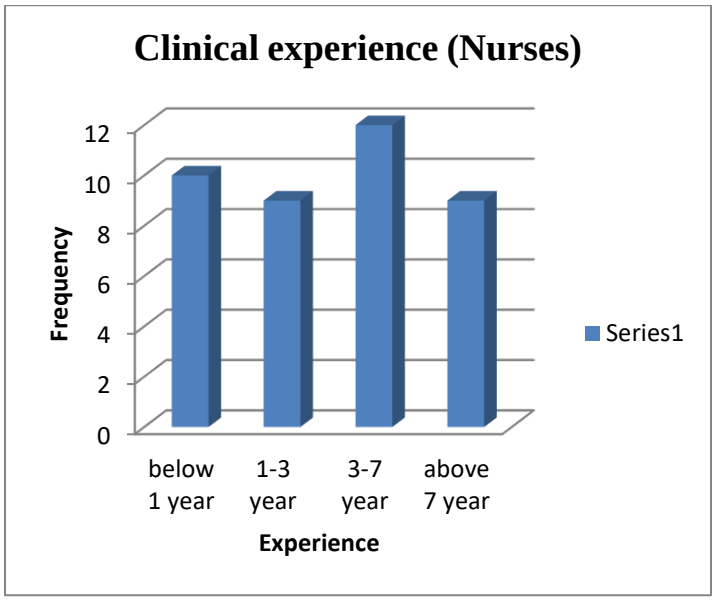


Figure (24) Graph showing Clinical experience among Nurses

Table (10) Response related to factors of the Module

Sl. No	Factor	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean
1	Module is User friendly	**8 (20%)**	**26 (65%)**	**6 (15%)**	**0 (0%)**	**0 (0%)**	**4.05**
2	Decrease in incidence related to wrong food dispatch to patients	**10 (25%)**	**20 (50%)**	**7 (17.5%)**	**3 (7.5%)**	**0 (0%)**	**3.92**
3	Module make easier to track the diet changes throughout the patient stay	**11 (27.5%)**	**23 (57.5%)**	**5 (12.5%)**	**1 (2.5%)**	**0 (0%)**	**4.1**
4	Post Implementation reduces paperwork /manual process	**10 (25%)**	**17 (42.5%)**	**5 (12.5%)**	**7 (17.5%)**	**1 (2.5%)**	**3.7**
5	Post implementation increases productivity	**11 (27.5%)**	**17 (42.5%)**	**10 (25%)**	**2 (5%)**	**0 (0%)**	**3.92**
6	Diet plan of a patient can be viewed from the HIS	**16 (40%)**	**24 (60%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**	**4.4**
7	Overall satisfaction with the module	**11 (27.5%)**	**23 (57.5%)**	**6 (15%)**	**0 (0%)**	**0 (0%)**	**4.12**
8	Easy Communication with dietician and F&B	**17 (42.5%)**	**20 (50%)**	**3 (7.5%)**	**0 (0%)**	**0 (0%)**	**4.35**
9	Require Enhancement/Modification in Module	**7 (17.5%)**	**18 (45%)**	**11 (27.5%)**	**4 (10%)**	**0 (0%)**	**3.7**

- Module is User friendly

  Module is user friendly is one of the important factors in being satisfaction rate among end users. The results are 26 (65%)) respondents agree that the module is user friendly, 8 (20%) respondents strongly agree and 6 (15%) respondents were neutral with the above comment with the module. The mean score is 4.05 indicate nurses are satisfied with the module.

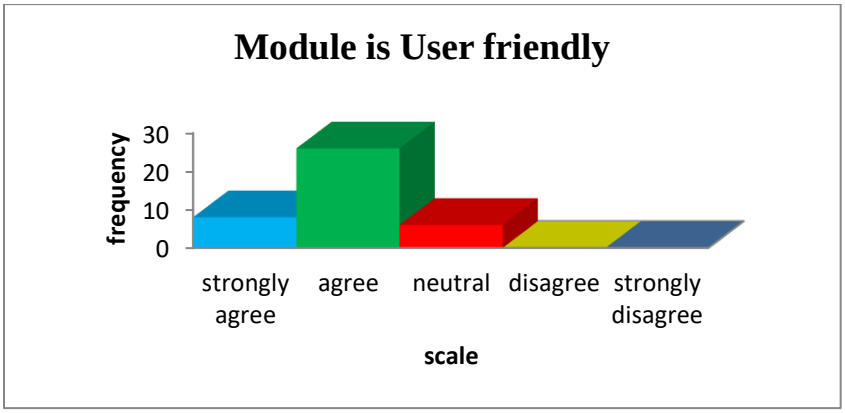


Figure (25) Graph showing Module is User friendly among Nurses

- Decrease in incidence related to wrong food dispatch to patients

  This is another comment about the module. 20 (50%) of respondents agree with the factor, 10 (25%) respondents are strongly agree, 7 respondents are neutral and 3 respondents disagree with the comment. The mean score is 3.92 indicates that nurses are satisfied with the module.

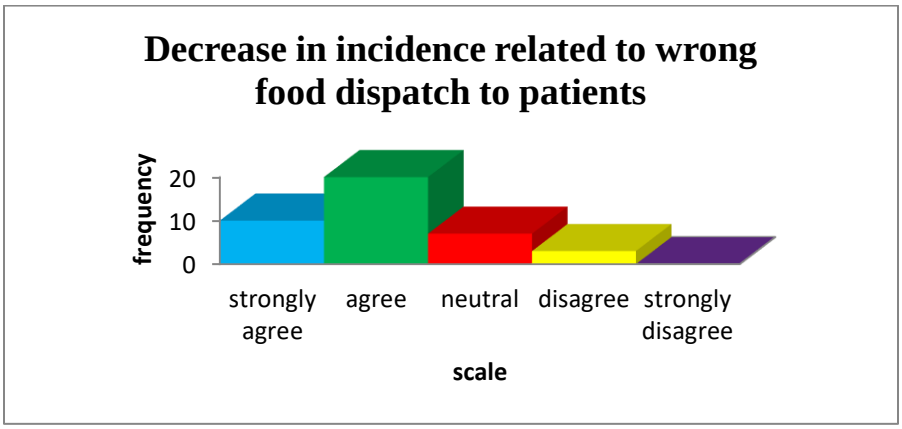


Figure (26) Graph showing Decrease in incidence related to wrong food dispatch to patients among Nurses

- Module make easier to track the diet changes throughout the patient

  23 (57.5%) respondents agree that module made easier to track the diet changes throughout the patient stay, 11 (27.5%) strongly agree, 5(12.5%) were neutral AND 1(2.5%) disagree regarding the above factor. The mean score is 4.1 indicates that they agree with the factor.

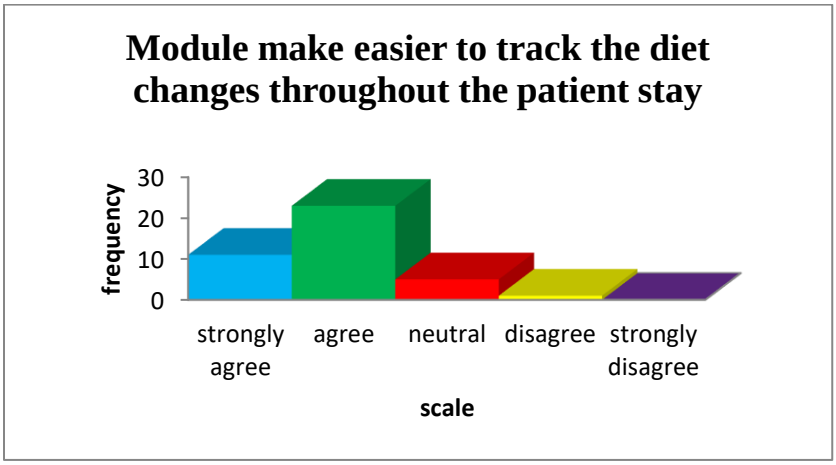


Figure (27) Graph showing Module make easier to track the diet changes throughout the patient stay among Nurses

- Post Implementation reduces paperwork /manual process

  17 (42.5%) respondents agree post implementation reduces manual work, 10(25%) strongly agree, 7 (17.5%) disagree about the factor. The mean score is 3.7 indicate that nurses are satisfied with the module.

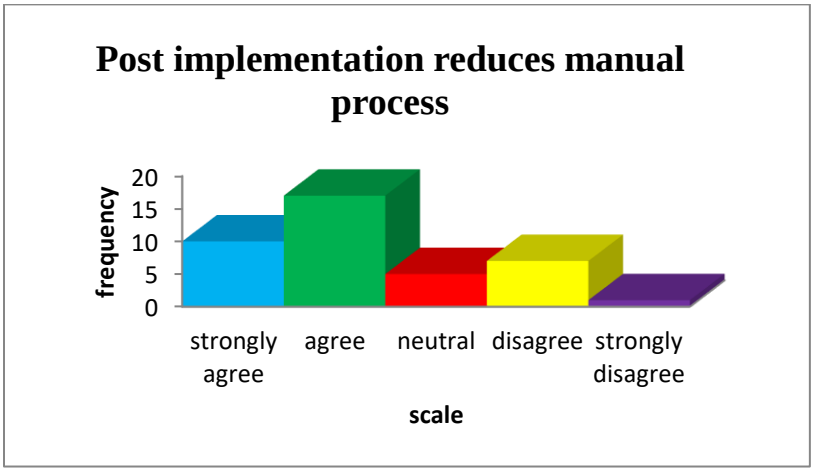


Figure (28) Graph showing Post Implementation reduces manual process among Nurses

- Post implementation increases productivity

  17 (42.5%) respondents agree that post implementation increases productivity, 11 (27.5%) strongly agree and 10(25%) were neutral with the above comment. The mean score is 3.92 indicate that nurses are satisfied with the module.

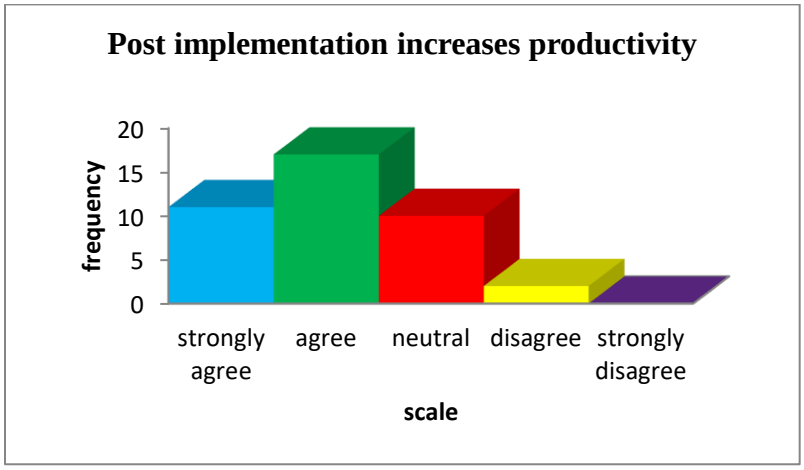


Figure (29) Graph showing Post implementation increases productivity among Nurses

- Diet plan of a patient can be viewed from the HIS

  24(60%) of respondents agree that diet plan of a patient can be viewed, 16(40%) of respondents strongly agree with the comment. The mean score is 4.4 indicating that nurses are satisfied with the module.

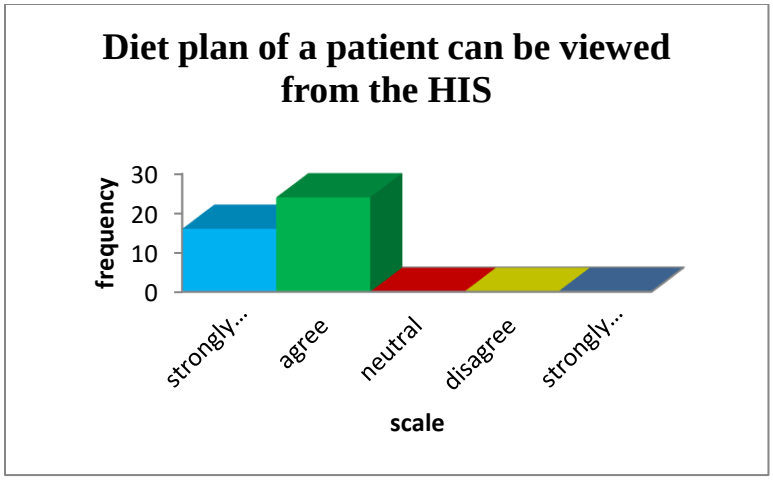


Figure (30) Graph showing Diet plan of a patient can be viewed among Nurses

- Overall satisfaction with the module

  23(57.5%) respondents agree with the above comment. The mean score is 4.12 indicating that nurses are satisfied with the module.

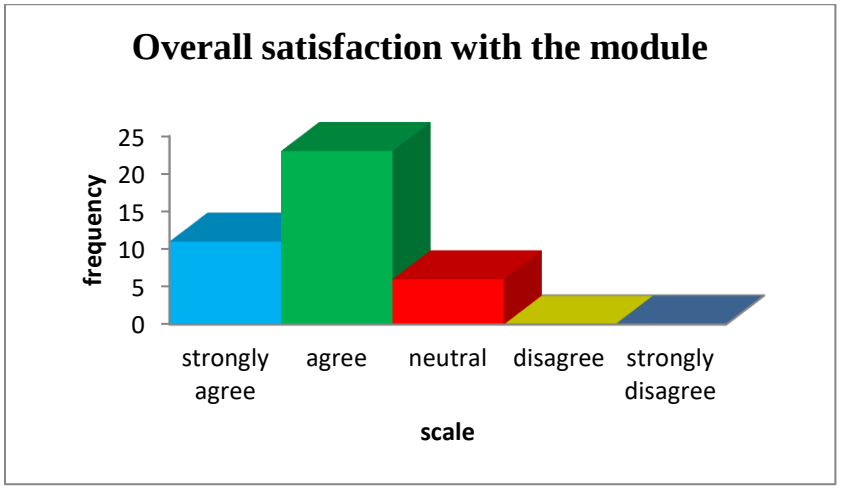


Figure (31) Graph showing satisfaction with the module among Nurses

- Easy Communication with dietician and F&B

  20(50%) of respondents agree with the factor. 17(42.5%) strongly agree with the comment. The mean score is 4.35 and standard deviation is 0.88 indicates that nurses are satisfied with the module.

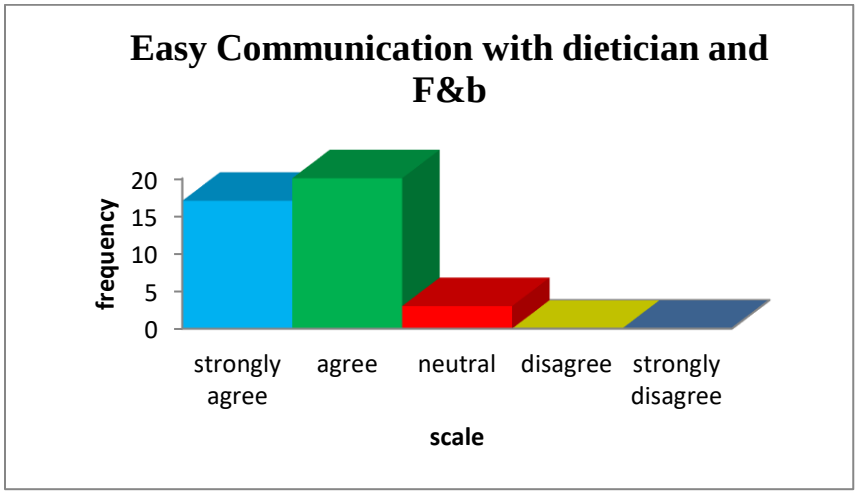


Figure (32) Graph showing Easy Communication with dietician and F&B among Nurses

- Require enhancements/modifications

  18 (45%) of respondents agree that module needed enhancement, 11(27.5%) respondents were neutral, 7(17.5%) respondents strongly agree and 4(10%) disagree with the comment. The mean score is 3.7 and standard deviation is indicate that nurses are satisfied with the module

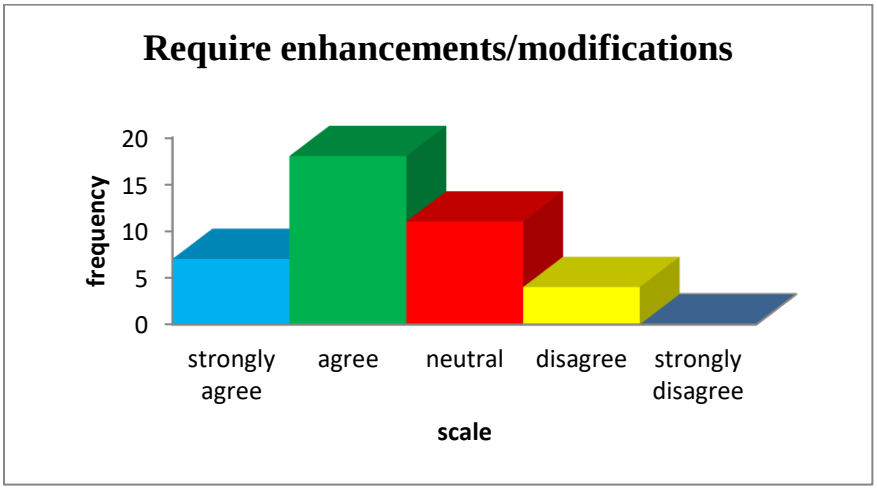


Figure (33) Graph showing requires enhancements/modifications among Nutritionists

Table (11) Characteristics of Respondents (F&B Staff) (N=10)

	Frequency	Percentage
Gender Wise Distribution		
Male	**8**	**80%**
Female	**2**	**20%**
Age Wise Distribution		
21-30 years	**2**	**20%**
31-40 years	**4**	**40%**
41-50 years	**4**	**40%**
Above 51 years	**0**	**0**
Qualification		
Diploma	**0**	**0**
Graduate	**6**	**60%**
Post Graduate	**4**	**40%**
Doctorate	**0**	**0**
Designation		
Manager	**2**	**20%**
F&B Staff	**8**	**80%**
Clinical Experience		
Below 1 year	**0**	**0**
1-3 year	**2**	**20%**
3-7 year	**3**	**30%**
Above 7year	**5**	**50%**

- Gender

  The respondents were asked to enter the gender

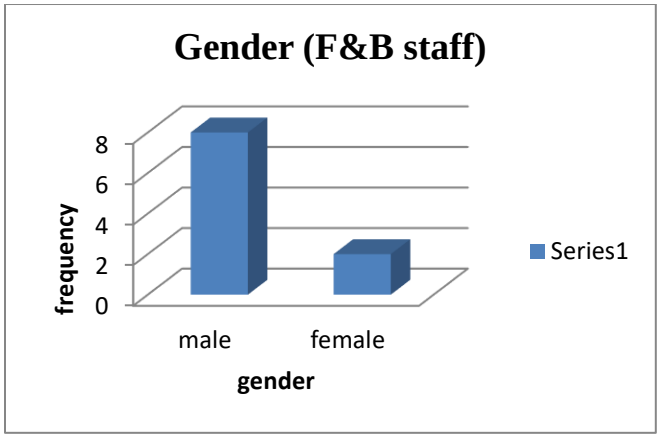


Figure (34) Graph showing Gender Distribution among F&B Staff

- Age Group

  The respondents were asked to enter the age group.

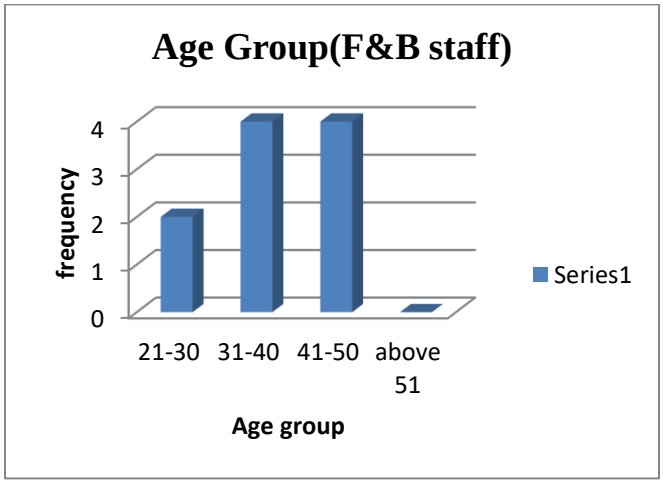


Figure (35) Graph showing Age Group Distribution among F&B Staff

- Qualification

  The respondents were asked to enter the qualification

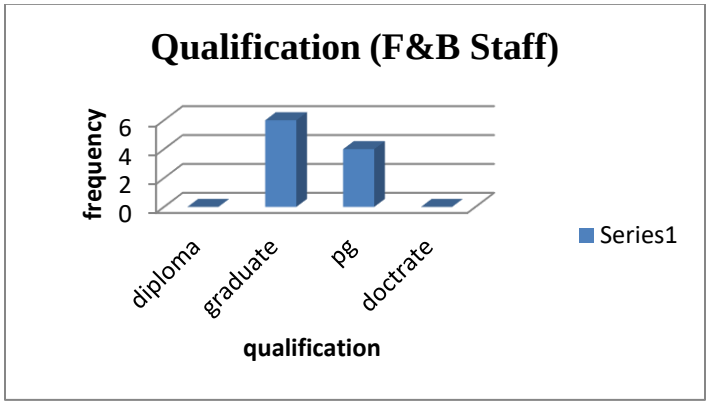


Figure (36) Graph showing Qualification among F&B Staff

- Designation

  The respondents were asked to enter the designation. Out of 10, 2 were Manager and remaining 8 were staffs in kitchen.

- Clinical Experience

  The respondents were asked to enter the clinical experience

Figure (37) Graph showing Clinical experience among F&B Staff

Table (12) Response related to factors of the Module

Sl. No	Factor	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean
1	Module is User friendly	3 (30%)	4 (40%)	3 (40%)	0 (0%)	0 (0%)	4
2	Decrease in incidence related to wrong food dispatch to patients	2 (20%)	6 (60%)	2 (20%)	0 (0%)	0 (0%)	4
3	Module make easier to track the diet throughout the patient stay	1 (10%)	8 (80%)	1 (10%)	0 (0%)	0(0%)	4
4	Post Implementation reduces paperwork /manual process	0 (0%)	8 (80%)	2 (20%)	0 (0%)	0 (0%)	3.8
5	Post implementation makes diet dispatch easier	3 (30%)	5 (50%)	2 (20%)	0 (0%)	0 (0%)	4.1
6	I am satisfied with F&B Module	2 (20%)	8 (80%)	0 (0%)	0 (0%)	0 (0%)	4.2
7	Easier to view Diet reports in the Module	8 (80%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	4.8
8	Require enhancements/modifications	0 (0%)	2 (20%)	8 (80%)	0 (0%)	0 (0%)	2.7

- Module is User friendly

Out of 10 respondents, 4 (40%) respondents says that module is user friendly. The other responses are strongly agree and neutral. The mean score for this factor is 4 indicates that they are satisfied with the module.

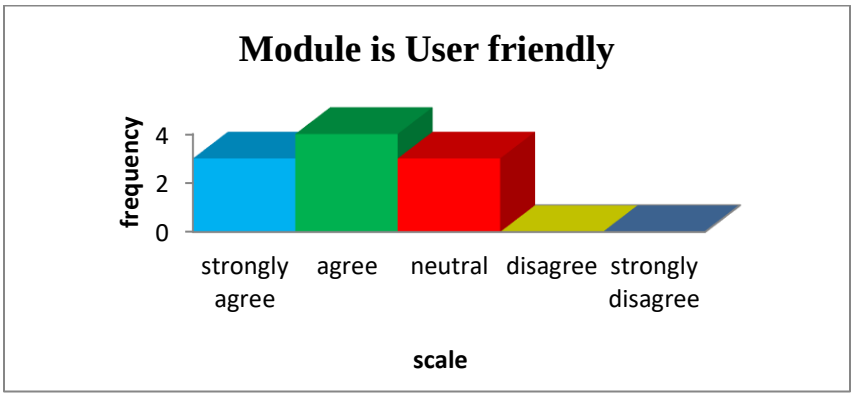


Figure (38) Graph showing Module is User friendly among F&B Staff

- Decrease in incidence related to wrong food dispatch to patients

  Out of 10 respondents, 6 (60%) respondents agree that after implementation there is decrease in incidence related to wrong food dispatch to patients. The mean score is 4 indicates that staffs are satisfied with the module.

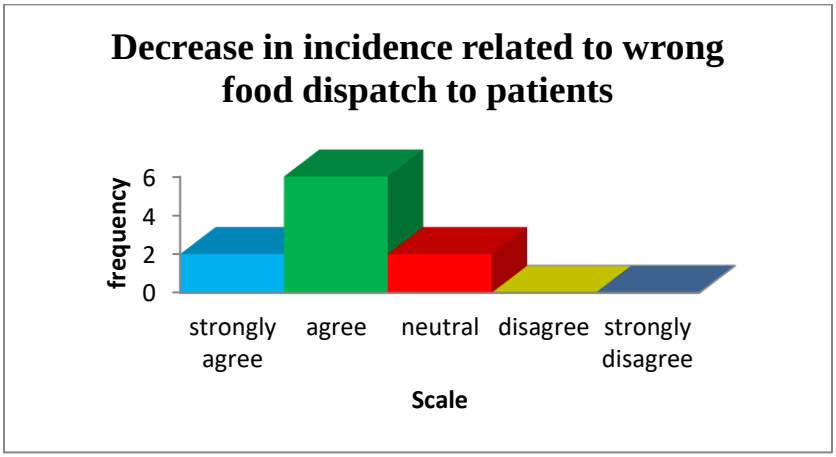


Figure (39) Graph showing Decrease in incidence related to wrong food dispatch to patients among F&B Staff

- Module make easier to track the diet throughout the patient stay

  Out of 10 respondents, 8(80%) respondents agree that module made easier to track the diet. The Mean is 4 indicates that the staff agree with the factor.

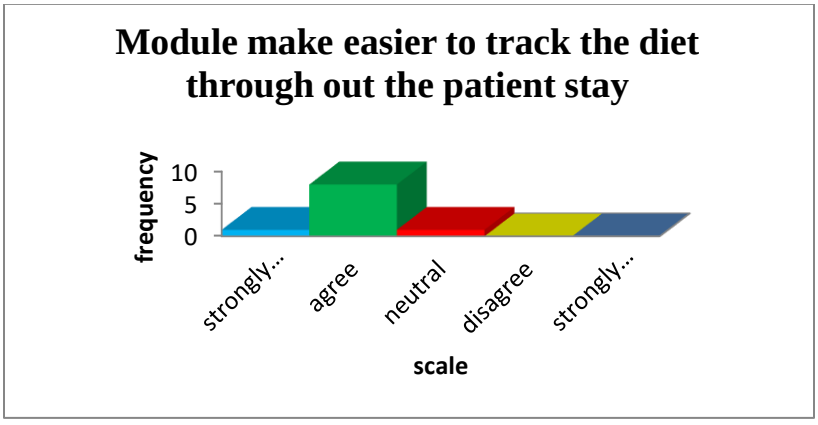


Figure (40) Graph showing Module make easier to track the diet throughout the patient stay among F&B Staff

- Post Implementation reduces paperwork /manual process

  Out of 10 respondents, 8 respondents agree that post implementation reduces paperwork. The mean score is 3.8 indicates that the staff are satisfied

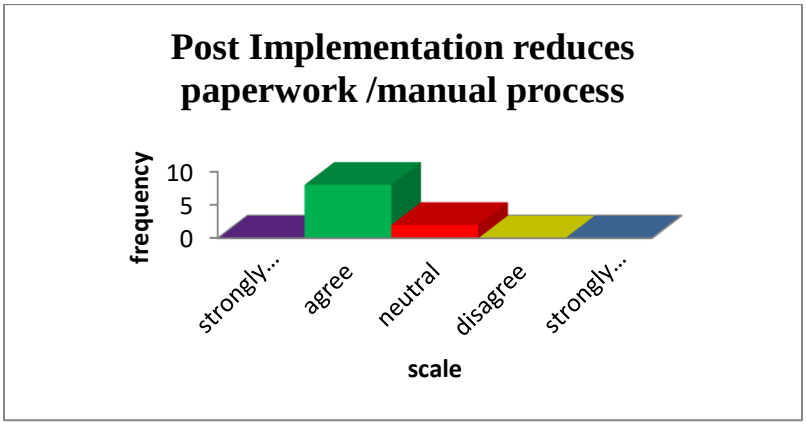


Figure (41) Graph showing Post Implementation manual process among F&B Staff

- Post implementation makes diet dispatch easier

  Out of 10 respondents, 5 respondents agree that diet dispatch becomes easier post implementation. The mean 4.1 indicates staffs are satisfied with the module

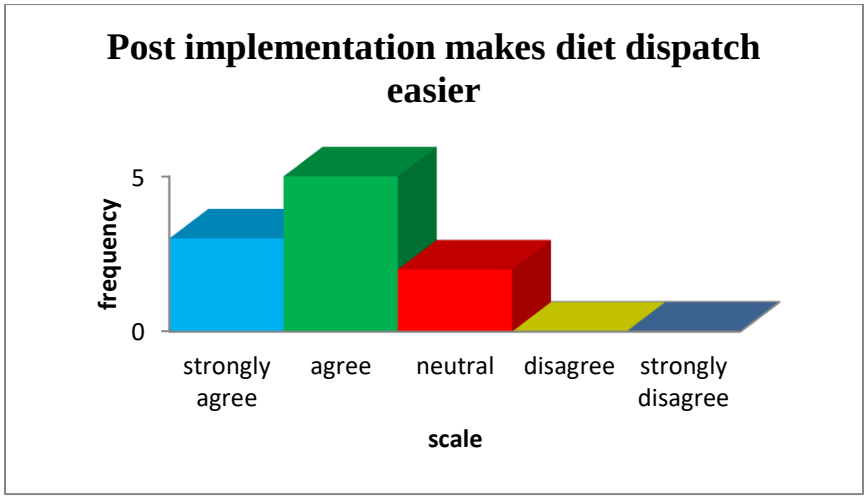


Figure (42) Graph showing Post implementation makes diet dispatch easier among F&B Staff

- I am satisfied with F&B Module

  Out of 10 respondents, 8 respondents agree that they are satisfied with the module. The mean is 4.2 indicates that they are satisfied with the module.

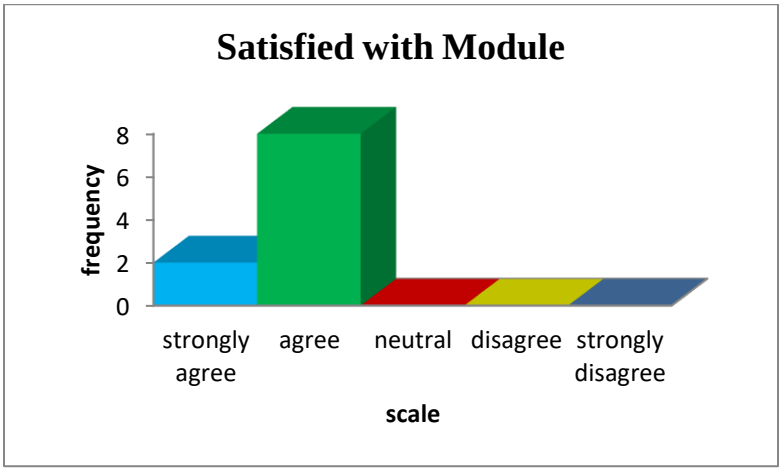


Figure (43) Graph showing satisfied with F&B Module among F&B Staff

- Easier to view Diet reports in the Module

  Out of 10 respondents, 8 respondents strongly agree that they can easily view diet reports. The mean is 4.8 indicates they are extremely satisfied with the factor.

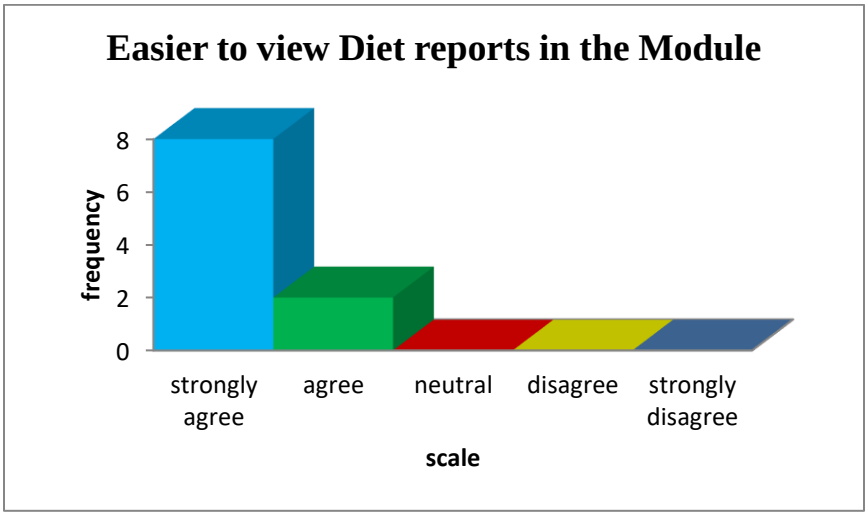


Figure (44) Graph showing Easier to view Diet reports in the Module among F&B Staff

- Require enhancements/modifications

  Out of 10 respondents, 8 respondents response was neutral regarding the enhancements. The mean is 2.7 indicates that staffs had neutral response with the factor.

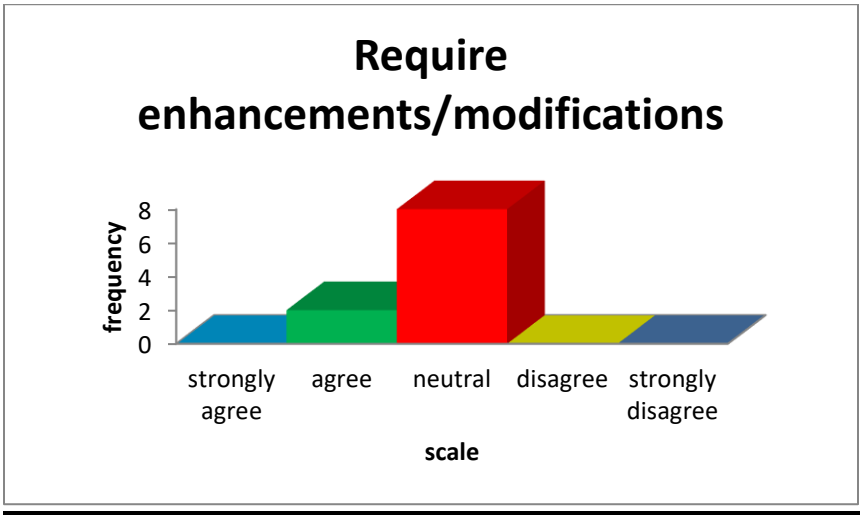


Figure (45) Graph showing requires enhancements/modifications among F&B Staff

Modification/ Enhancement recommended

- Smart Choice option when adding an item for a particular Meal type
- Repeating the same plan for further period
- Discharge patient name should be shown in another colour
- Vegetarian and Non Vegetarian need some colour code
- Require more diet category like neutropenic, low fat, combinations etc. required.
- Tick Box in the Diet IP counselling work list

Discussion

In this study the objective was to understand the satisfaction rate among end user post implementation. The end users were nurses, nutritionists and F&B staff. Factors affecting satisfaction rate were given in the questionnaire and end users rated (Likert Scale) the factors. The study results show that nurses and F&B staffs were satisfied with the features of the clinical nutrition module and understood the benefits achieved from implementation whereas nutritionists were not satisfied with the implementation. After implementation of the system there was much reduction in time taken for food dispatch to patients. The success of the system was that there is no complaints regarding food dispatch errors. Nutritionists were less satisfied with the system is not user friendly. According to nutritionists, they took more time planning a patients diet than it took earlier. The diet screen of Diet & Nutrition is featured in such a way that nutritionists had to delete each item in the screen. It takes more time. So after implementing the module, there is no reduction in time to plan the patient's diet. They want more user friendly software which makes their work easier and take less time to plan. All the respondents want enhancements in software so they can easily work.

Conclusion

Information system plays a critical role in effective operation of hospital. The Clinical nutrition module plays such a role in hospital. But only by implementing the information system/ software does not imply the success of a system. The success of any IT System implementation and adoption rate among end users depends on the perceived usefulness and ease of use of the system which in turn depends on the satisfaction of the end users on features and usability. This study helped to understand about the satisfaction rate of the end users which proves that there is always a scope of continuous improvement in the system to improve the operations of the system resulting in satisfaction to end users.

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- Is the ICU staff satisfied with the computerized physician order entry? A cross-sectional survey study, Renata Rego Lins Fumis at all

Appendices:

1. Questionnaire Used for the Study

Study on Satisfaction Rate among end users after implementing the Clinical nutrition/ F&B module

Respected Sir/Madam

I am Post Graduate student pursuing PGDHHM in Health care IT (Second Year) from International Institute of Health Management and Research, Dwarka, New Delhi. As a part of my project I'm conducting a study to the Satisfaction rate among end users after implementing the Clinical nutrition/ F&B/Support module in the hospital. So I request you to spare some of your precious time for this.

All responses will be kept strictly confidential. Completed surveys will be used for data entry and analysis. Only aggregated data will be used. No individual data or responses will be reported. Please check one response for each question and give your honest opinion.

Thanks for sparing valuable time

Vineetha S Pai

Consent form

I hereby agree to participate in research study "Satisfaction Rate among end users after implementing the Clinical nutrition/ F&B module in the hospital" conducted by Vineetha S Pai. The purpose and nature of the study has been explained to me.

I am participating voluntarily. I give permission for my interview. I understand that anonymity will be ensured in the write-up by disguising my identity.

Signed _____

Date _____

Questionnaire (Nurses)

Details of the Respondent

1) Name of the Respondent: _____
2) Gender : Male/ Female
3) Age: (1)21-30 years (2) 31-40 Years (3) 42-50 Years (4) Above 51 Years
4) Qualification: Diploma/ Graduate/ Post Graduation/ Doctorate
5) Designation
6) Clinical Experience: (1)Below 1 year (2)1-3 Years (3) 3-7 years (4)Above 7 years

Kindly rate and Tick your response to the factors given below on five point scales

1	Module is User friendly	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2	Decrease in incidence related to wrong food dispatch to patients	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	Module make easier to track the diet changes throughout the patient stay	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4	Post Implementation reduces paperwork /manual process	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	Post implementation increases productivity	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6	Diet plan of a patient can be viewed from the HIS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7	Overall satisfaction with the module	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8	Easy Communication with dietician and F&B	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9	Require enhancements/modifications	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Require Enhancements, If Yes

Questionnaire (Nutritionist)

Details of the Respondent

1) Name of the Respondent: _____
2) Gender : Male/ Female
3) Age: (1)21-30 years (2) 31-40 Years (3) 42-50 Years (4) Above 51 Years
4) Qualification: Diploma/Graduate/Post Graduation/Doctorate
5) Designation
6) Clinical Experience: (1)Below 1 year (2)1-3 Years (3) 3-7 years (4)Above 7 years

Kindly rate and Tick your response to the factors given below on five point scales

1	Module is User friendly	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2	Reduction in paperwork/manual process	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	Reduction in total time taken to plan the diet	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4	Easy communication with F&B	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	Able to track full diet plan and diet changes of patients	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6	Diet plan can be made easily	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7	Post implementation increases productivity	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8	I am satisfied with using Clinical nutrition module	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9	Require Enhancement/Modification in Module	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Require Enhancements, If Yes _____

Questionnaire (F&B Staffs')

Details of the Respondent

1) Name of the Respondent: _____
2) Gender : Male/ Female
3) Age: (1)21-30 years (2) 31-40 Years (3) 42-50 Years (4) Above 51 Years
4) Qualification: Diploma/Graduate/Post Graduation/Doctorate
5) Designation
6) Clinical Experience: (1)Below 1 year (2)1-3 Years (3) 3-7 years (4)Above 7 years

Kindly rate and Tick your response to the factors given below on five point scales

1	Module is User friendly	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2	Decrease in incidence related to wrong food dispatch to patients	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	Module make easier to track the diet throughout the patient stay	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4	Post Implementation reduces paperwork /manual process	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	Post implementation makes diet dispatch easier	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6	I am satisfied with F&B Module	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7	Easier to view Diet reports in the Module	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8	Require enhancements/modifications	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Require Enhancements, If Yes