

**Summer Training at
Fortis Hospitals,
Bangalore**

Analysis of the Health Status of the Food Handlers

**By
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**Under the guidance of
Dr. Barun Kanjilal**

**MBA Hospital and Health Management
2015-2017**



**The IIHMR University, Jaipur
2016**

CERTIFICATE

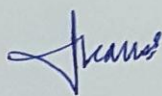
TO WHOMSOEVER MAY CONCERN

This is to certify that **Ms. Aashika Celine Joshu**, student of MBA in Hospital and Health Management from The IIHMR University, Jaipur has undergone summer training at **Fortis Hospitals, Bannerghatta Road, Bengaluru** from **1st April 2016 to 31st May 2016**.

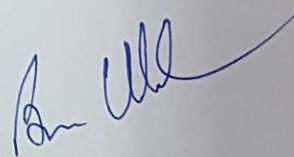
The candidate has successfully carried out the study designated to her during summer training and her approach to the study has been sincere, scientific and analytical.

The summer training is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.



Col (Dr) Ashok Kaushik
Dean, Academic and Student Affairs
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Dr. Barun Kanjilal
Professor
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Date: 1st June 2016

INTERNSHIP COMPLETION CERTIFICATE

This is to certify that **Ms. Aashika Celine Joshu**, Regn. No. IIHMR-U/01/2015-17/0244, a student of IIHMR University, Jaipur has successfully completed her internship in our organisation from 1st April 2016 to 31st May 2016.

During her tenure as an intern she has worked on the project titled: **“An Analysis on the Health Status of the Food Handlers”**.

The dedication and passion she has is worth appreciating. We wish her success in her future endeavors.

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ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of the project would be incomplete without the mention of the people who made it possible.

Firstly, I would like to thank IIHMR University, Jaipur and Fortis Hospitals, B.G Road, Bangalore for this opportunity. A special thanks to **Dr. S.D. Gupta, Dr. (Col) Ashok Kaushik, Dr. V.P. Raghuvanshi, Mr. Hem K Bhargava** and his team for their support. Secondly, I would like to thank and express my gratitude to my corporate mentor **Dr. Neesha Nair** (Head, Quality & Patient Safety) and my faculty mentor **Prof. Barun Kanjilal** for their valuable time, guidance, support and constructive feedback.

I would also like to extend my sincere thanks to **Ms. Bhavya Rai and Ms. Ramya Kushalappa** (Senior Executives, Quality & Patient Safety) for their constant support. **Dr. Murali Chakravarty, Dr. Sandhya Devarakonda, Dr. Sukanya Rangaswamy and Mr. Kallol Dutta** and his team requires a special mention, as without their valuable guidance and time I would not have been able to complete my project. A special thanks to the Human Resources Department at Fortis Hospitals, B.G. Road, Bangalore for their help and time.

Lastly, I would like to thank all those who were directly and indirectly involved in helping me complete the internship. I hope that I can build upon the experience and knowledge that I have gained and make a valuable contribution towards this industry in the coming future.

Abbreviations

B.G	Bannerghatta (Road)
CBC	Complete Blood Count
CSSD	Central Sterile Supply Department
ER	Emergency Room
EtO	Ethylene Oxide
F & B	Food & Beverage
Hb	Haemoglobin
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
kVA	Kilo-volt-ampere
NABH	National Accreditation Board for Hospitals and Healthcare Providers
OT	Operation Theatre
RO	Reverse Osmosis
SCC	Suggested Clinical Co-relation
SOP	Standard Operating Procedure
TLC/WBC	Total Leukocyte Count/White Blood Cell
VDRL	Venereal Diseases Research Laboratory (test)

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CHAPTER 1

INTRODUCTION TO FORTIS HOSPITALS



1. 1 About the Organisation

Fortis Healthcare Limited is a leading integrated healthcare delivery service provider in India. Founder Chairman Late Dr. Parvinder Singh established it in 1996. The healthcare verticals of the company primarily comprise hospitals, diagnostics and day care specialty facilities. The company operates its healthcare delivery services in India, Dubai, Mauritius and Sri Lanka with over 55 healthcare facilities (including projects under development), approximately 10,000 potential beds and 260 diagnostic centers.

The Fortis Hospital at Bannerghatta Road is a Joint Commission International (JCI) and National Accreditation Board for Hospitals and healthcare providers (NABH) accredited 400-bedded multi-speciality tertiary care hospital. It began operations in 1999 with Fortis Healthcare Ltd, Delhi as its governing body and has established itself as a trusted institution in the field of healthcare and medical facilities. The hospital specializes in cutting edge medical technology and dedicated patient care services. The hospital has a large team of 150 experienced consultants and 1000 skillful para-medical staff. As one of the leading multi-speciality hospitals in the country, the hospital offers tertiary care in over 40 specialties that include cardiology, cardiac surgery, orthopaedics, neurology, neuro-surgery, Gastrointestinal and Minimal Access Surgery (MAS), amongst other. The hospital has been instrumental in the introduction of facilities like the

custom fit knee replacement and High-intensity focused ultrasound technology for prostate cancer in India. The hospital is equipped with state-of-the-art technologies like trans-radial angioplasty, trans-abdominal cardiac surgery, and computerized Total Knee Replacement (TKR) navigation surgery.

In 2014, the US-based Medical Travel Quality Alliance (MTQUA) ranked it third amongst the Top 20 hospitals across the globe for medical tourists. Other notable achievements include, NABH SAFE-I, Nursing Excellence and National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditations.

1.2 Brand and the Logo



The Fortis brand with its distinctive logo is a synthesis of human values of trust, ethics and service and quality healthcare. They project clinical excellence, distinctive patient care, transparency in actions & high level of integrity and excellence is all that we do. The integration of the hands (in a distinctive 'green' with a 'red dot') and the human figure is completely seamless and is representative of 'Fortis' responsive approach to healthcare. The green colour of hands is representative of health, wellbeing, compassion, nurturing and generosity while the red dot gives an immediate association to our Indian roots, while it is also represents energy, spirituality, courage and symbol of good luck.

1.3 Vision

"Saving and Enriching Lives"

1.4 Mission

"To be a globally respected healthcare organization known for Clinical Excellence and Distinctive Patient Care"

1.5 Core Values

➤ Patient Centricity

Commit to 'best outcomes and experience' for our patients.

Treat patients and their caregivers with compassion, care and understanding.

Our patients' needs will come first.

➤ **Ownership**

Be responsible and take pride in our actions.

Take initiative and go beyond the call of duty.

Deliver commitment and agreement made.

➤ **Integrity**

Be principled, open and honest.

Model and live our 'Values'.

Demonstrate moral courage to speak up and do the right things.

➤ **Innovation**

Continuously improve and innovate to exceed expectations

Adopt a 'can-do' attitude

Challenge ourselves to do things differently

➤ **Team Work**

Proactively support each other and operate as one team.

Respect and value people at all levels with different opinions, experiences and backgrounds.

Put organization needs' before department / self-interest.

1.6 Scope of Services

Anesthesiology	Pediatric Gastroenterology
Cardiac Anesthesia	Pediatric Surgery
Cardiology	Pediatrics
Cardiothoracic surgery	Plastic and Reconstructive Surgery
Dermatology and Venereology	Psychiatry
Emergency Medicine	Radiation Oncology
Endocrinology	Radiology
General Medicine	Respiratory Medicine
General Surgery	Rheumatology
Hepatology	Sports Medicine

Hepato-Pancreato-Biliary Surgery	Surgery
Infertility and Assisted Reproduction	Surgical Gastroenterology
Medical Gastroenterology	Surgical Oncology
Medical Oncology	Urology
Neonatology	Vascular Surgery
Nephrology	Gynecological Oncology
Neurology	
Neuro-Radiology	
Neurosurgery	
Obstetrics and Gynaecology	
Ophthalmology	
Orthopedic Surgery	
Otorhinolaryngology	
Paediatric Cardiology	
Paediatric Cardio-Thoracic	

Clinical Support Services:

Blood Bank- Transfusion Services
Dietetics
Rehabilitation
Psychology
Occupational Therapy
Physiotherapy
Speech and Language Therapy

Details of Diagnostic Services:

2D Echo
Audiometry
Electroencephalogram
Electromyography/Electrophysiology
Holter Monitoring
Spirometry
Treadmill Test
Urodynamic Studies

Laboratory Services:

Clinical Bio-Chemistry
Clinical Microbiology and Serology
Clinical Pathology
Cytopathology
Haematology
Histopathology
Molecular Biology
Toxicology

Other Diagnostic Services:

Bone Densitometry
Computed Tomography Scanning
Digital Subtraction Angiography Lab
Mammography
Magnetic Resonance Imaging
Ultrasound
X-ray

1.7 Observational Learning

❖ Emergency Room/Department (ER): -

Process of Emergency ward-

- 1) Arrival in Emergency Department
- 2) Register
- 3) Initial Assessment (Triage)
- 4) Prioritize in the Queue
- 5) Assessment (Medical History and Examination).
- 6) Treatment Plan (Investigations & Plan of Care).
- 7)
 - Admission
 - Discharge (No-follow-up needed)
 - Outpatient Appointment

In the ER, there are 2 ambulances that have Advanced Cardiac Life Support (ACLS), while 4 ambulances are outsourced. Thrice in a day they check inventories in Ambulance, even if the ambulance is not used. At the entrance of the emergency block, a bell is placed; it is used to call the staff from the emergency ward. Once the patient reaches the ER, the initial assessment is done in the triage area. After analyzing the state of patient, if patient is injured he/she taken for dressing to the procedure room. Then the patient is shifted to a particular bed in the following order and given necessary treatment:

- Red- Patient is critical
- Yellow- Patient needs attention
- Green- Patient is Stable

There are in total 4 yellow beds, 3 red beds, and 9 green beds.

Apart from this, there is a storeroom where consumable, patient clothes etc. are kept. There are also bags having essential medicines required for emergency purposes for ambulances kept ready.

The ER staff is trained to use the arterial blood gas (ABG) analyzer machine, which is used to check blood group, potassium, electrolyte, haemoglobin, etc. This machine is essential as it gives results within minutes so that the doctor and nurse can act accordingly.

The ER also has a black box in which they store essential medicines just in case of a disaster/mass casualties etc.

During night 2 doctors and 6 nurses are available for the duty. In case of a medico legal case (MLC) they follow the procedure in accordance with the law.

❖ **Department of Nephrology- Dialysis (Process): -**

Dialysis is a process of removing excess water and waste from the blood due to improper functioning of kidney in body of human being.

Fortis Hospital, B.G. Road has 12 beds having 12 machines for dialysis and 2 dialysis machines have been placed in the Intensive care unit (ICU). On an average they receive 40 cases per day, in addition to the cases in ICU. When a patient comes, they consult the nephrologist and decide the treatment plan. Once they have worked out a schedule, before every dialysis procedure, firstly they check the vitals of the patient, including weight. They do all the other important check up's prior to the procedure. They also see if the patient is infected from human immunodeficiency virus (HIV), Hepatitis B or C. If the patient is HIV positive then they do not continue with the care.

While, the patients infected from Hepatitis B or C are kept in different rooms and extra precaution is taken to treat those patients in order to avoid infections.

95% of the patients come twice a week for dialysis and a standard dialysis procedure takes almost 4 hours and in ICU it depends on the condition of the patient. They use an intra jugular catheter. After the procedure, everything is discarded except the filter. The machines have alarms, which beep in case the filter is not in a good condition. Otherwise, the filter can be used upto 15 times per patient and each filter has the unique hospital identification (UHID) number of the respective patient labeled on it. The ratio of staff and the patient is 1:3.

❖ **Department of Endoscopy: -**

The department has 3 doctors (1 pulmonologist and 2 gastroenterologists), the support team comprises of 7 members (including 2 technicians and 1 housekeeping staff). In total there are 11 beds and 3 procedure rooms. They have 3 machines, in which one is portable for ICU. Both diagnostic and therapeutic procedures are performed and on an average 15-20 cases are dealt with. Their shift is from 7:30 am to 5:30 pm and after 5:30

pm on call service is available. 2 doctors are present to diagnose patients and they work alternatively in the OPD and in the department.

The following procedures are performed: endoscopy, colonoscopy, bronchoscopy, endoscopic retrograde cholangio-pancreatography, fluoroscopy, nasal scope, ENTscope, endoscopic ultrasound, endo bronchial ultrasound and capsule endoscopy.

Every 2-3 months servicing of the machines takes place and after every 6 months the calibration of the machine is done.

❖ **Central Sterile Service Department (CSSD): -**

The operation theatre (OT) staff will call CSSD after the surgery, to collect instruments for sterilization. Once it is collected, it goes directly to the washing area. They segregate instruments into micro, macro and sharp and put in different trays. They use Reverse osmosis (RO) or distilled water to wash. There are two types of washing -normal and washer disinfection using an enzymatic solution (8ml/litre). After which the instruments are transferred from the washing area to the sterilizing area. They use a window known as pass box (it has an air curtain to control pressure). For sterilization they put the instrument in the autoclave machine for 15-20 minutes at around 124° celsius.

There are 4 types of indicators for different sterile procedures to check the sterility: -

- Class 4 indicator- Initially it will be in white color, once the equipment is sterilized, it will turn into black.
- Bowie-Dick indicator
- Bio-indicator
- Chemical indicator

To sterilize catheters instruments they use Ethylene Oxide (EtO) gas at 37°-55° celsius. For catheters since it is plastic and very thin washing is done by using taps with high pressure water, they pack them in medical grid pouch and they keep them in steam with EtO pack and then keep in EtO sterilization storage machine and dispatch when needed.

Instruments made up of rubber, silicon, and plastics are sterilized using EtO a liquefied gas. This gas is poisonous, highly lethal, colorless and odorless. Hence as a safety precaution, positive air pressure is maintained so that this air does not go out and gas detectors (alarm) is present so if there is a gas leak, code orange is activated and the air conditioning is switched off, while they evacuate the occupants.

For HIV patients, the same procedure is followed but it is kept separately. If by mistake the infected water goes to eyes of washer, they have eye washer for them as a safety measure.

In a gist the steam sterilization process includes: -

- 1) Receive reusable unsterile materials/instruments
- 2) From all user departments.

- 3) Clean/wash/process/dry
- 4) Assemble as per requirement of surgery
- 5) Pack and then sterilize
- 6) Once instrument is sterilized it will turned into black [TST indicator (temp, steam, and time)]
- 7) Store
- 8) Dispatch

❖ **Material Management (Main Store): -**

Main store is a support service and it comes under supply chain management, which also includes the purchase department. It is a vital part, of the organization as it deals with finance and inventory of crores of rupees of the hospital. Usually, if the patient's bill is Rs 100 then, Rs 33 is the material cost in the patient's bill, i.e. 33% of the total bill. The main store follows the standard operating procedure's (SOP) that is divided into 15 chapters.

Main store is further divided in to two sub-stations: -

- a) Consumables
- b) Stationary

Indent is raised in order to procure any item from the stores.

Intend are of two types: -

- a) Against indent request (Non- Stackable items)
- b) Regular items (Oxygen mask, Syringe, gloves etc.)

Once the indent from the respective department has been raised with the signature from the respective Head of the Department, it provides available the quantity mentioned in indent. If the stock is not present, purchase request (PR) is sent to the purchase department. A purchase order (PO) is then generated to the vendor. The vendor usually supplies a regular item within 24 hours. A goods received note (GRN) is generated once the supply by vendor is successful.

Following material inspection criteria is followed for the incoming material: -

- 1) Quantity, as per purchase order.
- 2) Batch No.
- 3) Expiry Date
- 4) Manufacture/Brand
- 5) Temperature condition while transportation (If cold chain is essential)
- 6) Packaging /Seal intact (Properly pasted/not torn).

❖ **Maintenance Department: -**

Another support service and their role is to maintain power supply with backup, water supply, medical gases, building ventilating system (standard temperature and pressure) and the overall maintenance of the building. They have 1 engineer, 2 technicians, a general team including a carpenter, plumber, electrician etc. and one team for the ward maintenance during a shift and there are 3 shifts in total. Manpower is around 22 in which only 4 people are insourced.

They have 2 transformers 1000*2 kilo-volt-ampere (kVA) and 2 diesel generators (1000*2 kVA). Thus there is 100% backup and 24 hours supply of electricity. Total power consumption is 5, 00, 000 units per month.

There are 4 types of water supply- domestic, flushing, fire hydrant system and for clinical RO water. The RO water is supplied to four departments- Dialysis, CSSD, Lab and OT. They have 8 water storage tanks (100 kilo-Litre (kL) each). Water consumption is near about 2, 00, 000 liters per day.

Medical gases comprises of carbon dioxide, nitrous oxide, vacuum suction system and liquid oxygen. These gas pipes are painted in different colors for easier identification and they are directed to the respective wards through the centralized supply system. For example, nitrous oxide goes only to the OT.

As far as the ventilation system (air handling unit) is concerned, the airflows to the specific areas as per the requirement. For example, in the OT chambers air changes 20-25 times per minute and every OT has its own air handling system. In OT, a temperature of 16° to 18° celsius is maintained and the relative humidity at 55%. In the medical ICU a temperature of 22° celsius is maintained. There is also a centralized exhaust system.

Help desk provides 24*7 hours service and complaints are entered in an excel sheet and once looked into it's updated in the excel itself. Logbook as such is not maintained. They also check to see if the lifts are functioning well, service is done on an annual maintenance contract. There are in total 8 lifts with a capacity of 1000 kgs per lift.

CHAPTER 2

PROJECT: - ANALYSIS OF THE HEALTH STATUS OF THE FOOD HANDLERS

2.1 A Brief Introduction to the Food & Beverage Department

The food services department aims at providing high quality, hygienically prepared food to meet the nutritional needs of patients. There are around 120 food handlers in the hospital, which includes cooks, kitchen staff, stewards, coordinators, and supervisors and they have two shifts. All of the food services are out-sourced but the head of the department is appointed by the hospital. He is expected to coordinate with the outsourced caterers. Food is prepared in the kitchen area and is then brought down to the food service area either using the food lift or manually in trolleys. The foodservice personnel then takes the food to the respective patients according to their dietary plan. The patient receives food thrice in a day and apart from this they are also given soup/fruits/snacks/beverages at around 11 am and 4 pm.

The hospital has dedicated a floor exclusively for the cafeteria services to meet the food and refreshment needs of guests, outpatient department patients and patient relatives. It also provides appropriate meal services for the employees as approved of by the management. Apart from this there is also a café in hospital premises. The food handlers have a separate canteen for themselves outside the hospital.

2.2 Rationale

A food handler is any person who handles food, regardless of whether he actually prepares or serves it. The food handlers' health matters to patient care and there is a consistent association between the safety climate for employees and the patient safety culture. All aspects of work environment should be attended to in order to foster a culture of patient safety and quality as it is of utmost priority to a hospital. Thus for a hospital concerned with providing the best level of patient care, it is incumbent that the food provided is of an equally high quality too. At the same time the health and the safety aspect of the food handlers is also the responsibility of the hospital. The best way of preventing or decreasing the problem of food borne diseases and any related issues is to educate the food handlers and repeating the training periodically, in addition to inspection as the food handlers come in direct contact with the patients food and if they are carrying any infection it will pass onto the patients aswell. When the review of literature was conducted it was found that the previous studies mainly focused on the hygiene factors of the food handlers and there was not much literature found on the importance of analyzing their health condition, working environment and likewise. Hence, this study looks at it from a different point of view.

Therefore a medical check up for all food service personnel includes: Physical Examination- a) Chest X-ray b) Urine & Stool routine c) Complete blood count (CBC) d) Venereal disease research laboratory test (VDRL). Typhoid and Hepatitis B vaccine are not offered as a routine to the food handlers but the hospital makes sure that the typhoid vaccination is administered.

At Fortis Hospitals, the health check-ups are done for all employees before they join the organisation as a prerequisite to their employment and thereafter every six months after the employee has joined. The medical exam also ensures the productivity and efficiency of employee, which is valuable asset for any organization. The NABH and JCI do have standards for the hospitals to be followed by all involved in the patient care and safety and it is a necessity that hospitals look into all categories whether big or small. Hence a study was done to analyze the health status of the food handlers in the hospital from the year 2014 (Jul-Dec) to 2016 (Jan-Jun).

2.3 Research question

Is the health check-up done for all the food handlers before joining the hospital and every six months thereafter by the hospital according to the SOP?

2.4 Objectives

- To find out if the food handlers are aware of the health check-up policy and its implications.
- To validate the data against the health check-up reports of the food handlers and thereby to identify those employees whose reports are showing abnormal ranges.
- To find out the major health problems and to understand the reasons behind their ill-health, if any.
- To make sure that a follow up is done for those food handlers who have any abnormality/health issue.

2.5 Materials and Methods

2.5.1 Study population, area and period

The study was conducted for the food handlers of Fortis hospital, B.G. Road, Bangalore, and Karnataka. The study period was from 18th April 2016 to 25th May 2016.

2.5.2 Study design

A retrospective descriptive study was conducted to analyze the health check-up reports of the food handlers after which structured interviews were conducted to validate the data.

2.5.3 Sample size

A sample size taken was 29 (health reports) for 2014 (Jul-Dec), 43 for 2015 (Jan-Jun), 73 for 2015 (Jul-Dec) and 102 for 2016 (Jan-Jun).

2.5.4 Data collection tools and procedures

It was done by validating the secondary data that was entered into an excel sheet against the hard copy or the actual reports. At the same time, primary data was collected by conducted structured interviews on few food handlers using the non-probability convenience sampling to validate the data and the sample size was 37. The structured interview was conducted face to face mainly to evaluate their level of knowledge regarding the health check-up, its implications and health safety measures and precautions to be taken during their duty in the kitchen.

Initially, the objective of the study was not to only validate the data against the health check-up reports and thereafter to identify any health issues/abnormalities in the report. Later, the interviews were conducted to understand the ground reality and to identify if there was any scope for quality improvement.

The health check-up reports included the food handler's complete blood count, urinalysis, microbiology including stool culture, chest x-ray and typhoid vaccination reports. The haematology test included haemoglobin, hematocrit, total leukocyte count, neutrophils, eosinophil, lymphocytes, monocytes and basophils. The urinalysis test looked at the pH, glucose, protein, ketones, blood, bilirubin, urobilinogen, nitrite, white blood cell, epithelial cells, red blood cell, casts, crystals, bacteria, bile salts, bile pigments and amorphous deposits. While for the microbiology test, the colour, consistency, mucus, visible blood, polymorphonuclear leukocyte, red blood cell, macrophages, charcot leyden crystals, trophozoites, cysts, ova, larvae, adult parasite, occult blood, stool culture and organism was looked into. For the purpose of this study only selected parameters were taken into account. In haematology, haemoglobin, total leukocyte count/white blood cells and eosinophil count was studied. It also had a prescription from the doctor with their height, weight, age, pulse rate and blood pressure. For urinalysis, glucose, protein, white blood cell and bacteria was looked into. Under microbiology, mucus, visible blood, polymorphonuclear leukocytes, trophozoites, cysts, ova, stool culture and organism was studied. The doctor prescribed either medicines or tests according to their requirement and asked them to follow-up if it was necessary.

2.5.5 Ethical Consideration

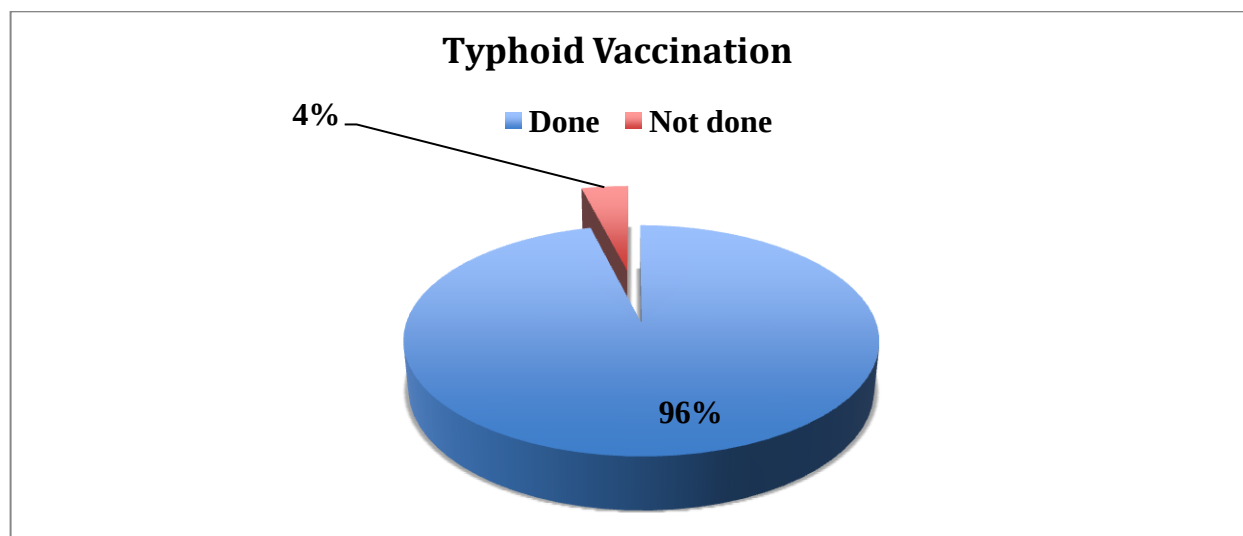
The identities of the participants (food handlers) involved in the study were kept anonymous.

2.6 Findings

2.6.1 Findings from the secondary data (health reports) analysis

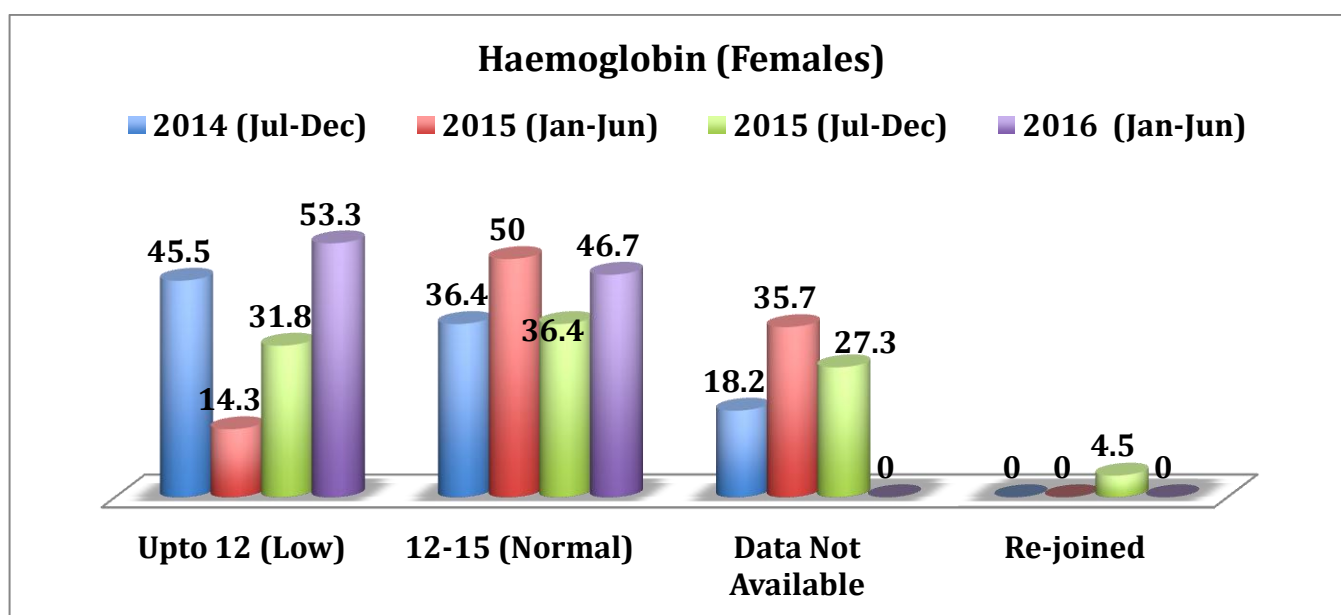
The main findings of the data validation was that, as seen in **Figure 1** in 2016 (Jan-Jun), 96% of the food handlers who took part in the study took the typhoid vaccination and the remaining 4% did not take it due to some personal reasons/pregnancy.

Figure 1: Food handlers who took the typhoid vaccination in 2016 (Between Jan-Jun)



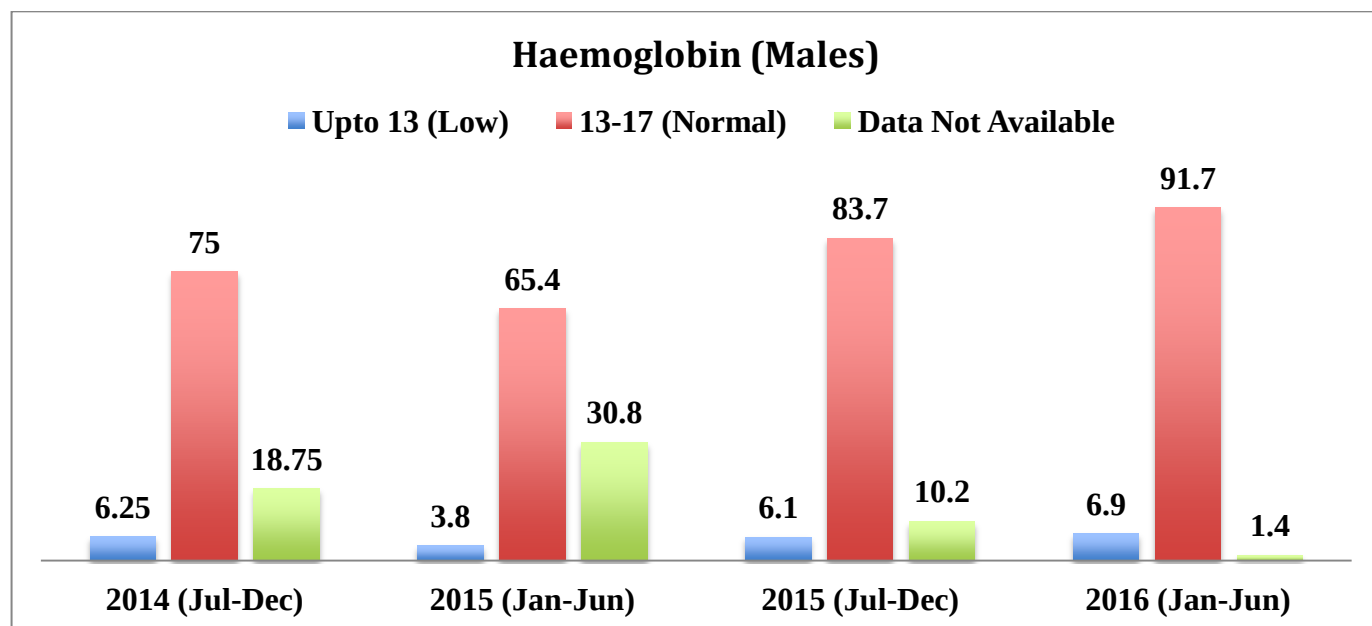
As seen in **Figure 2** the mean haemoglobin for females in 2014 (Jul-Dec) was 11.90, 12.13 for 2015 (Jan-Jun), 11.42 for 2015 (Jun-Dec), 11.40 for 2016 (Jan-Jun). The number of females was 11 for 2014 (Jul-Dec), 14 for 2015 (Jan-Jun), 22 for 2015 (Jul-Dec), 30 for 2016 (Jan-Jun). 45.5% (5) females had a haemoglobin level ranging 9.5 to 11.8 g/dl in 2014 (Jan-Dec). 31.8% (7) females had a haemoglobin level ranging 8.3 to 11.2 g/dl in 2015 (Jul-Dec). 53.3% (16) females had a haemoglobin level ranging 7.4 to 11.6 g/dl in 2016 (Jan-Jun).

Figure 2: Haemoglobin level of females during 2014 (Jul-Dec) to 2016 (Jan-Jun)



In **Figure 3** we can see that the mean haemoglobin for males was 14.44 in 2014 (Jul-Dec), 14.83 in 2015 (Jan-Jun), 14.75 in 2015 (Jul-Dec), 14.77 in 2016 (Jan-Jun). The number of males was 16 in 2014 (Jul-Dec), 26 in 2015 (Jan-Jun), 48 in 2015 (Jul-Dec), 72 in 2016 (Jan-Jun).

Figure 3: Haemoglobin level of males during 2014 (Jul-Dec) to 2016 (Jan-Jun)



In **Figure 4** shows the analysis of the total leukocyte count/ white blood cell reports and the number of samples were 28, 41, 73 and 102 respectively from 2014 (Jul-Jan) to 2016 (Jan-Jun). In 2015 (Jul-Dec) 12.3% (9) employees had a high total leukocyte count/white blood cell (TLC/WBC) and in 2016 (Jan-Jun) 16.7% (17) food handlers had a high TLC/WBC of greater than 10 μ L.

Figure 4: Total Leukocyte Count (White Blood Cell) for 2014 (Jul-Dec) to 2016 (Jan-Jun)

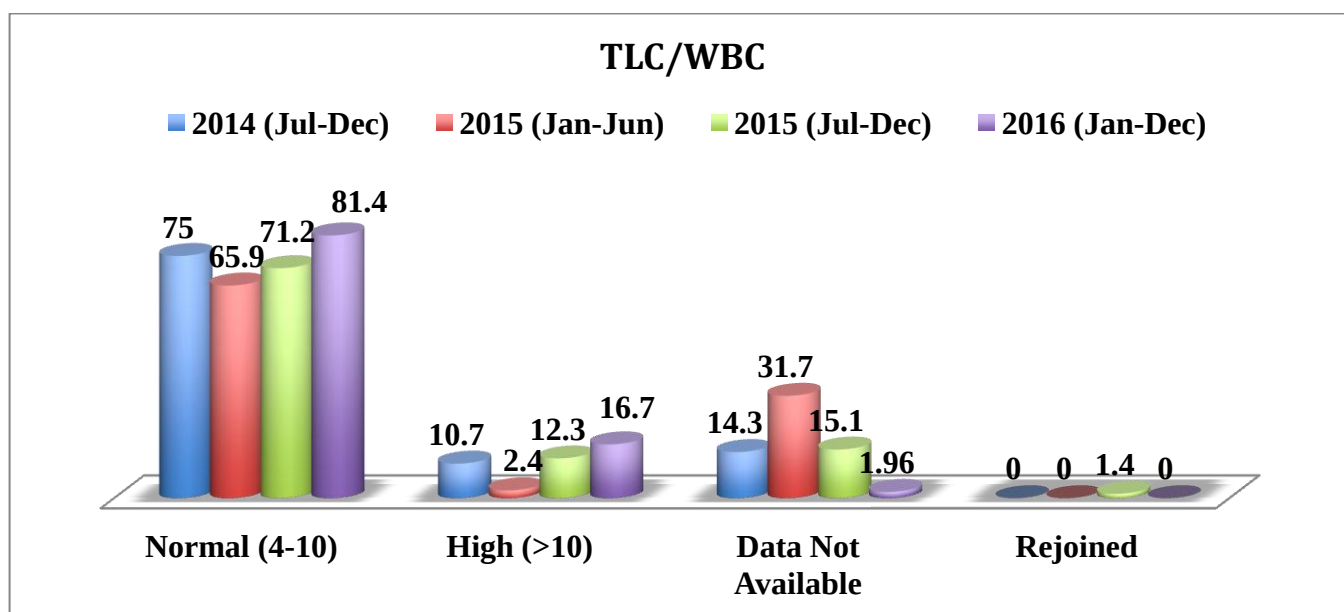
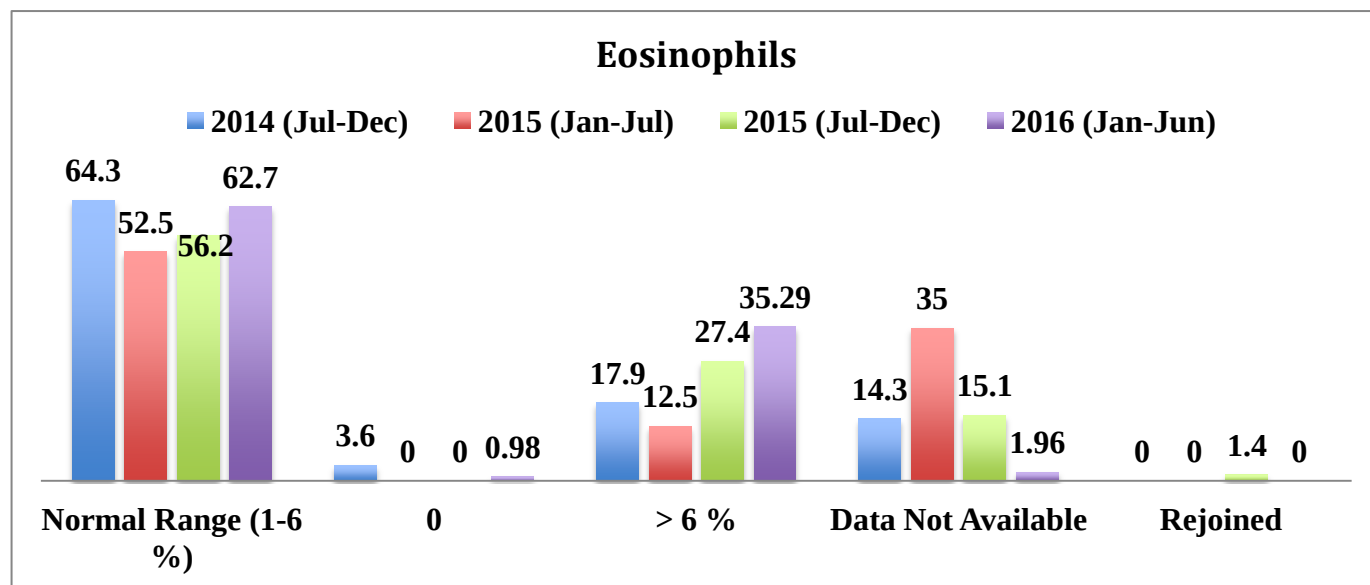


Figure 5 shows that, over the years, the number of people with high eosinophil count increased. In 2014 (Jul-Dec), 17.9 % (5) out of 28 food handlers had high eosinophil count ranging from 7 to 12 μ L. In 2015 (Jan-Jun), 12.5% (5) out of 40 food handlers had a high eosinophil count ranging 7 to 14 μ L. Out of the 73 reports in 2015 (Jul-Dec), 27.4% (20) of them had a high eosinophil count ranging 7 to 18 μ L. In 2016 (Jan-Jun), 35.3% (36) out of the 102 food handlers had a high eosinophil count between 7 and 22 μ L.

Figure 5: Eosinophil Count for 2014 (Jul-Dec) to 2016 (Jan-Jun)



The urinalysis reports of the food handlers did not have significant abnormalities and for the few people with some abnormal readings the doctor had prescribed whatever was required. Even when the microbiology reports were analyzed, major abnormalities were not found, especially in stool culture and organism.

In **Figure 6** we can see that, in the second half of 2014, 46.4% (13) of 28 food handlers were negative for stool culture and organism. During the first half of 2015, 34.1% (14) out of 41 of them had been tested negative for stool culture and organism. While in the latter half of 2015, 45.2% (33) of 73 were tested negative and in the first half of 2016, 61.8% (63) of the food handlers out of 102 of them were tested negative for the same test. The main problem was that significant amount of data was not available for all these years.

Figure 6: Stool culture/ Organism for 2014 (Jul-Dec) to 2016 (Jan-Jun)

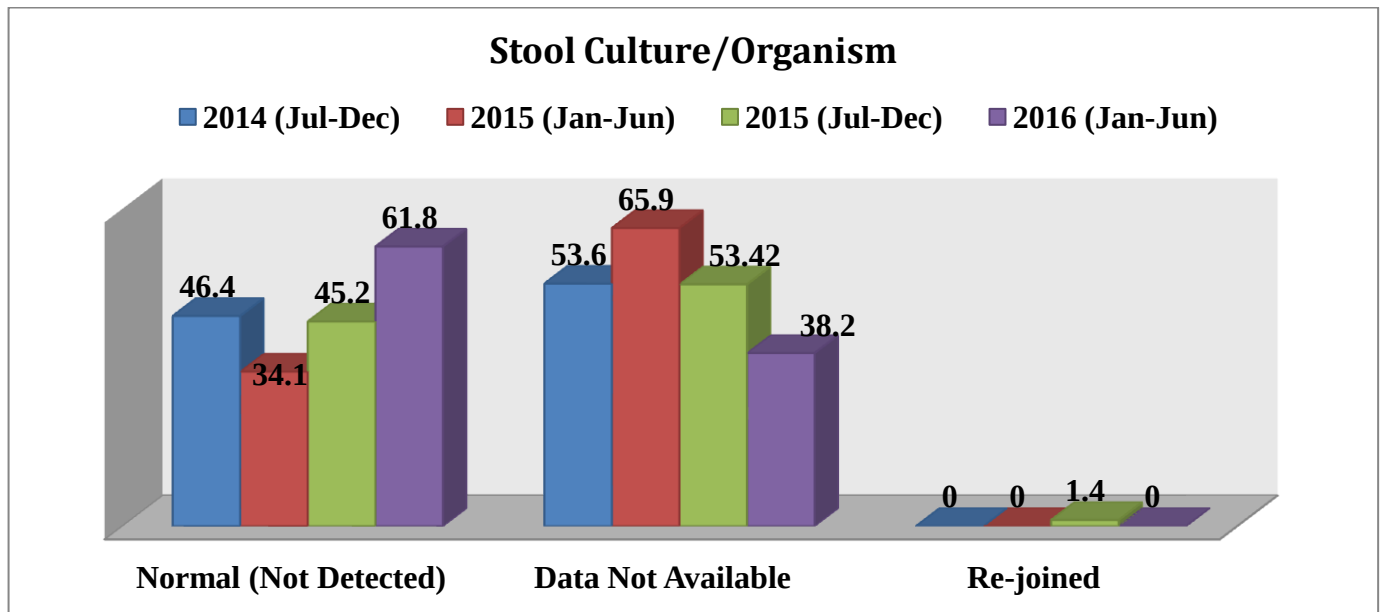
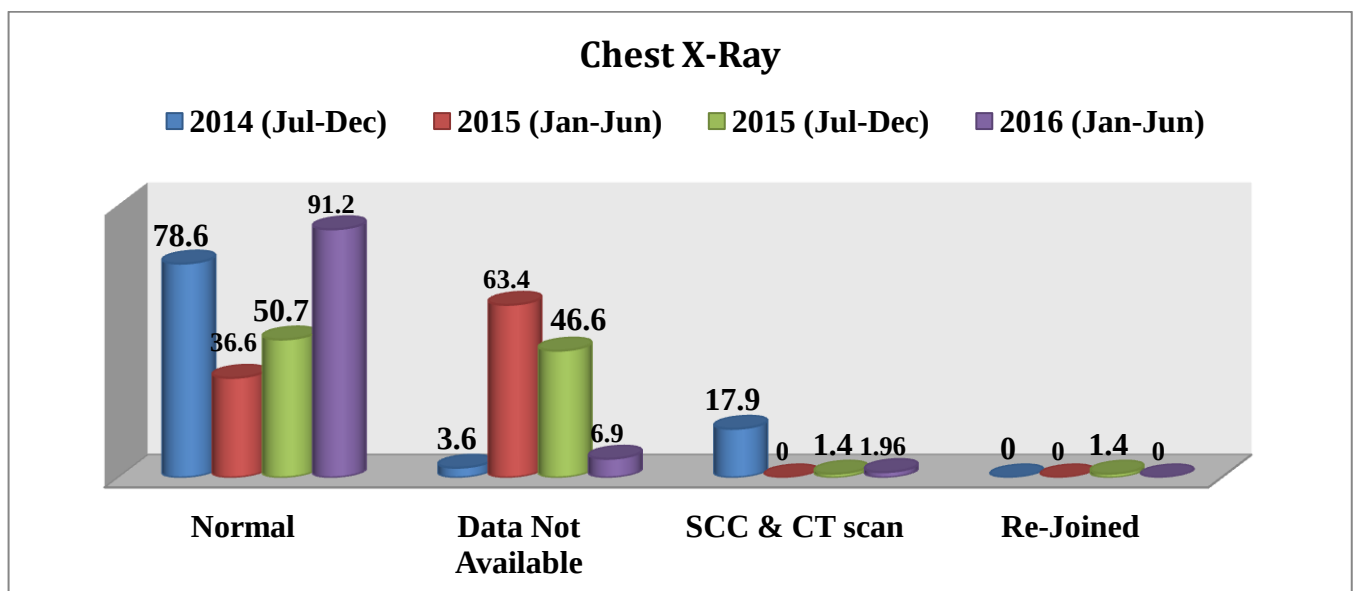


Figure 7 shows that after the data validation of chest X-ray reports in 2014 (Jul-Dec), 78.6% (22) of the 28 food handlers had a clear chest. In 2015 (Jan-Jun), 36.6% (15) of 41 food handlers had a normal chest x-ray report but 63.4% (26) reports were not available. While in the latter part of the year, 50.7% (37) out of 73 of them had a normal chest and 46.6% (34) chest x-ray reports were unavailable. In 2016 (Jan-Jun), 91.2% (93) of the food handlers had a clear chest. For 17.9% (5) food handlers in 2014 (Jul-Dec), 1.4% (1) in 2015 (Jul-Dec) and 1.96% (2) of them in 2016 (Jan-Jun) the doctor suggested clinical co-relation (SCC) and CT scan.

Figure 7: Analysis of Chest X-ray reports from 2014 (Jul-Dec) to 2016 (Jan-Jun)



In the above charts the food handlers who rejoined the hospital within 6 months of leaving the hospital are shown separately to ensure that the tests are not repeated on them as this helps the hospital from unnecessarily spending their money and time.

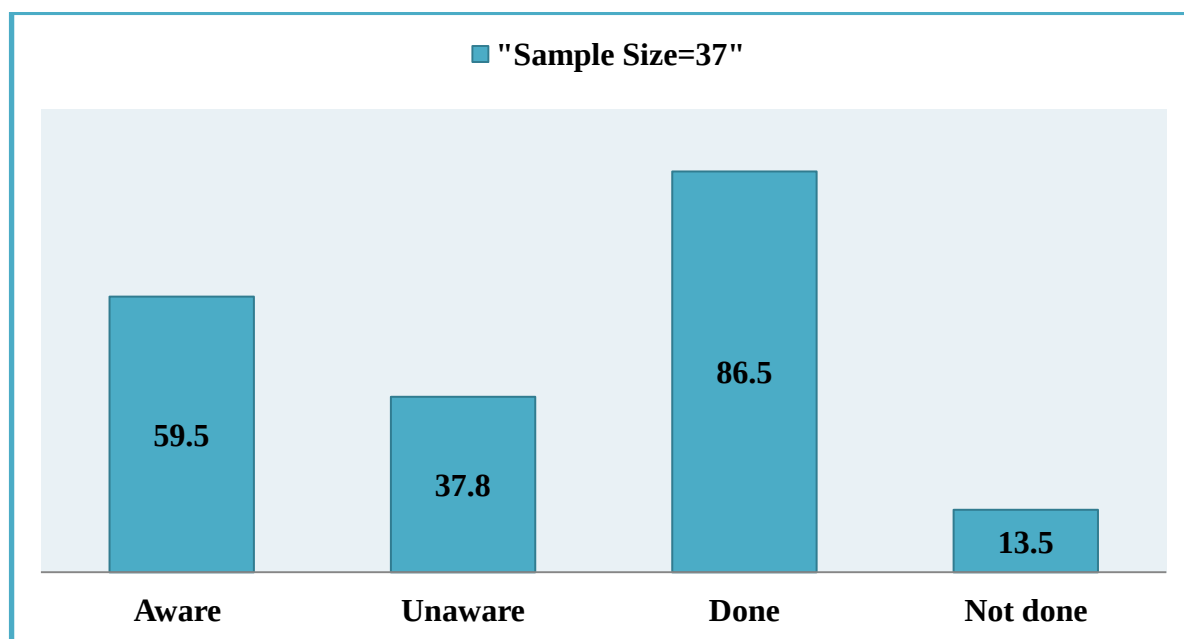
While data unavailable implied that either the hard copy of the health report was not there or the food handler did not give the sample for testing.

2.6.2 Findings from the primary data (structured interviews) analysis

This primary data was collected to understand the ground reality, i.e. to see whether the data matches with what the food handlers have to say, at the same time it was also done to find out if they know the implications of the health check-up and also safety precautions to be taken in the kitchen during their duty and to suggest recommendations accordingly. A total of 12 questions were asked to them, the questionnaire was a mixture of open and close-ended questions. (Enclosed in Annexure A-Questionnaire used for the structured interviews)

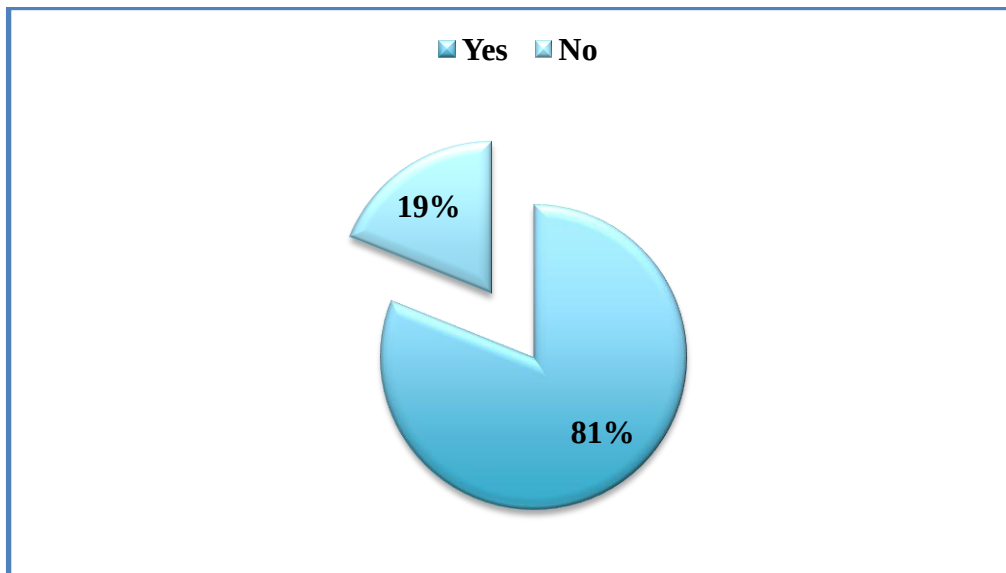
Figure 8 shows the percentage of food handlers who are aware of the health check-up and its implications and also it shows the percentage of food handlers whose health check-up was done. 59.5% of them were aware; while 37.8% were unaware and they feared the moment they were asked if their health was fine. They think that they would be taken off their employment if found with any abnormality in their report and this perception needs to be changed. The structured interviews also validated that health check-up was done except for those who were new joiners and food supervisors who were not directly involved in the food preparation.

Figure 8: Shows the awareness of health check-ups among the food handlers and the percentage of food handlers who went for their health check-up.



The structured interviews also validated the fact that the typhoid vaccinations have been taken by 81% of the food handlers as shown in the figure below. **Figure 9** also shows that 19% of the food handlers did not the typhoid vaccination and the reason for the same was that they were new employees or they were not involved in the food preparation.

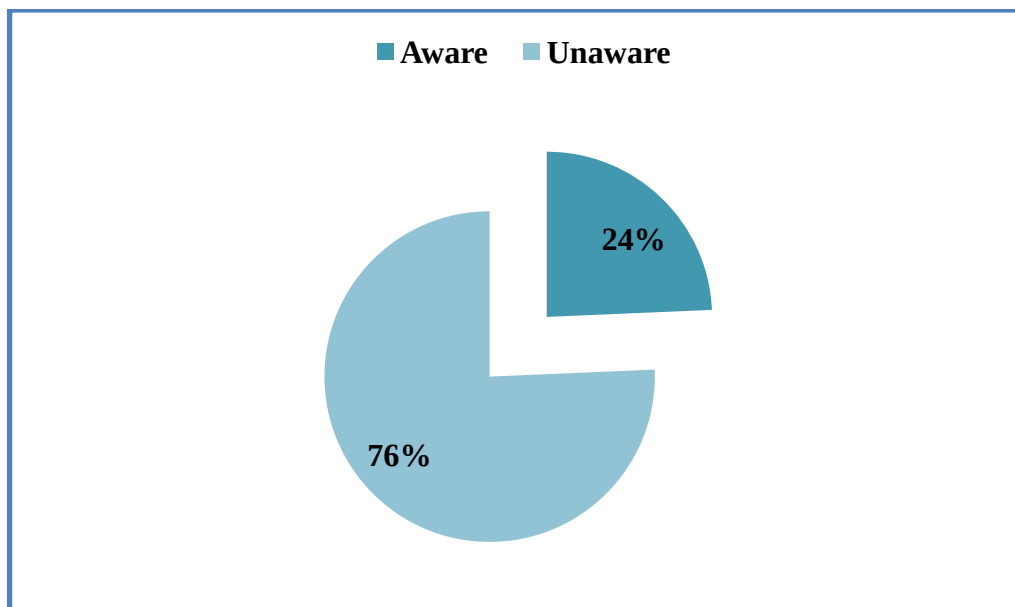
Figure 9: Percentage of food handlers who took the typhoid vaccination



When asked the food handlers about the safety precautions to be taken during their duty in the kitchen, only 24% of them were aware and 76% of the food handlers were unaware.

These food handlers were also unaware about the existence of the first-aid box in the department. There was a misconception that they would go to the ER if any kitchen accident occurs, while some thought they should go to their supervisor.

Figure 10: Are the food handlers aware or unaware about the safety precautions to be taken while their duty in the kitchen?



2.7 Discussion and recommendations

Based on the findings of the study and discussions with the concerned doctors, the study concluded by saying that all those food handlers who had a low Hb level, would come for the follow-up after 8-12 weeks of their health check-up with their new CBC after taking the prescribed iron tablets. Haemoglobin was important because sometimes low Hb level could be a symptom of a parasitic infection. But in this study it was found that mainly females had a low Hb level count and this is a common site, especially in India. The female food handlers who had a low Hb count were from economically backward classes and hence their diet could be one of the reasons why their Hb level was low.

Typhoid vaccination was given to them even though it was not a part of the routine medical examination. While the Hepatitis B vaccination was not given to them and VDRL test was not conducted as stated in the SOP. The SOP states that the health check-up of the new food handlers should be done prior to their employment or within 7 days of joining as the main reason for not taking the typhoid vaccination was that the food handlers were relatively new employees but few were already working for 1 month or more.

Another intriguing factor in the study findings were that many food handlers had a high eosinophil count. While trying to understand the root cause of high eosinophil count, hook worm infestation came up as one of the reasons but since the tests for stool and organism was negative for all the food handlers who were examined implied that there is no obvious reason for this asymptomatic high eosinophil count for some and that it could be because of their allergy to dust for some others. The kitchen area is usually very humid and hence the chances are high that molds form, which gives rise to mites that, again causes an allergic reaction causing the eosinophil count to rise. However, it was suggested that the food handlers who had a relatively high eosinophil count take de-worming tablets and then go for a follow-up with their new eosinophil count. The maintenance department could go for inspection of the kitchen area to ensure that the right temperature is maintained so that the moisture does not increase.

As seen during the primary data collection (structured interviews), the food handlers were worried by just the mention of doctor. They feel they are going to be taken off their employment, all of the food handlers said everything in their tests were normal and that the doctor did not give them any medicine. Hence it is important that they are made aware of the purpose of the health check-ups through health education and that meeting the doctor does not necessarily mean that they are unwell. At the same time, they are also worried about the money that might have to be spending on healthcare.

As far the hospital is concerned, the employee welfare and productivity is linked and also the medical health check-up is mandatory exercise to ensure that there are no major threats to the patient as well.

When the health education is given, another major focus should be on health safety of the food handlers, especially the precautions to be taken while their duty in the kitchen should be covered. Basic first-aid training can be given, as the food handlers are prone to kitchen accidents. Firstly, they should be told that there is a

first-aid box in their department. Minor kitchen accidents like cuts, burns etc. could be treated at their department itself. Fire safety department could give them a briefing on how to use the fire extinguisher and general fire safety instructions as well.

Even though there was no foodborne illness in the hospital, a session on food safety could also be taken, mainly the WHO “golden rules” for safe food preparation could be explained to them. As a precautionary step the food handlers could practice good personal hygiene like hand washing and wearing of gloves.

As a far stretched goal the F & B department can go for the coveted International organisation for standards (ISO) 22000:2005- Hazard analysis and critical control points (HACCP) accreditation. This will help the F & B department to improve overall. The accreditation will ensure that the department does not miss out on aspect of proper functioning and thereby nothing will hinder in the way of quality patient care.

Future scope of this study

Due to time restraints statistical analysis could not be done and thereby the study would be more scientific if we found out whether the findings were statistically significant or not.

There are several approaches to this study, one was the food handler’s health status and their hygiene practices, another was their safety in the kitchen while working and the other was the safe food handling practices. In this study, personal hygiene of the food handlers was not studied and hence it did not cover all the aspects of their health safety.

Annexure A

Questionnaire used for the structured interviews (primary data collection): -

Q. 1) What is your name?

Q. 2) What is your designation/role in the department?

Q. 3) On which date did you join the hospital?

Q. 4) How often do you go your health check-up in the hospital?

Q. 5) When was your last health check-up and did you meet with the doctor?

Q. 6) Was there any abnormality with the reports? (Yes or No) If no, go to Q. 9.

Q. 7) If yes, did the doctor prescribe any medicines or tests?

Q. 8) Did you follow-up with the doctor afterwards?

Q. 9) Have you taken the typhoid vaccination? (Yes or No)

Q. 10) Did the doctor give any de-worming tablets? (Yes or No)

Q. 11) What are the health related safety issues during duty in the kitchen?

Q. 12) What are the precautions & measures taken at the time of any health related safety issue?

Annexure B

Photographs taken during the study.

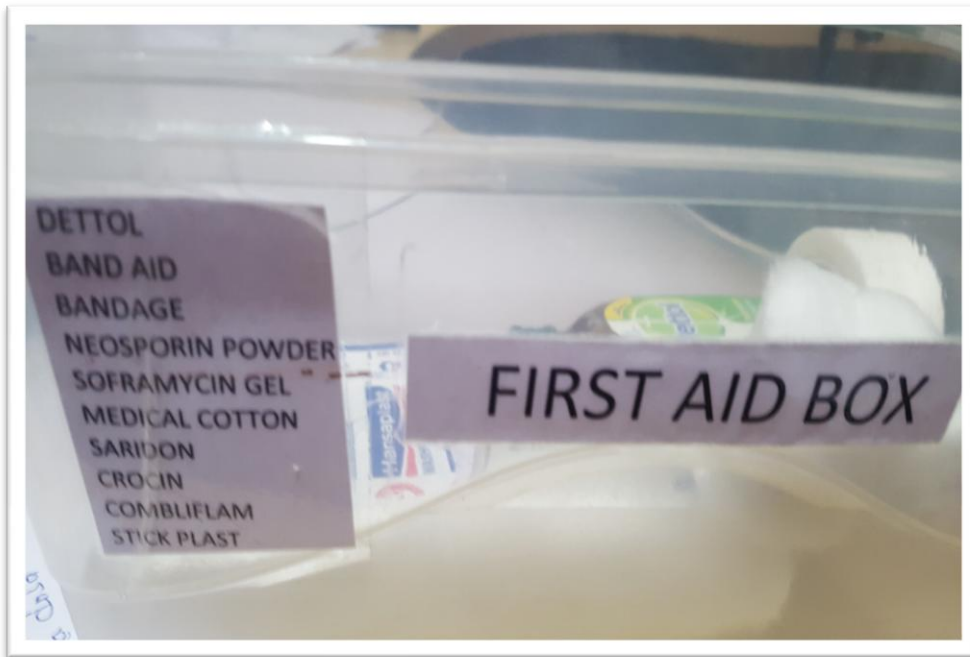
While conducting the structured interviews: -



Fire extinguisher at the kitchen area: -



First-aid box at the kitchen area: -



Cooking area: -



Washing area: -



Store room: -



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