CHAPTER III
METHODOLOGY
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## METHODOLOGY

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CHAPTER- III
METHODOLOGY

Research is the systematic, rigorous investigation of a situation or problem in order to generate new knowledge or validate existing knowledge. Research in healthcare takes place in a variety of areas and has many potential benefits; the areas include professional practice, environmental issues affecting health, vitality, treatments, theory development, healthcare economics, and many others. Healthcare research can be conducted by one group of professionals for generation of knowledge specific to that group, or by a diverse group of researchers collaborating on a given healthcare problem.

3.1 INTRODUCTION

EXPLORATORY RESEARCH is a research conducted for a problem that has been defined by the researcher to gain additional inputs. It often occurs before we know enough to make conceptual distinctions or to posit an explanatory relationship. Exploratory research develops concepts more clearly, establishes priorities, develops operational definitions and improves the final research design. Exploratory research helps determine the best research design, data-collection method and selection of subjects. It also draws definitive conclusions with the selective subjects. Given its fundamental nature, exploratory research often concludes that a perceived problem does actually exist but can be added on to conclude a protocol or remedial action. (Shields, P. M., & Rangarajan, N. (2013).

Social exploratory research "seeks to find out how people get along in the setting under question, what meanings they give to their actions, and what issues concern them. The goal is to learn 'what is going on here?' and to investigate social phenomena without explicit expectations." This methodology is also at times referred to as a grounded theory approach to qualitative research or interpretive research, and is an attempt to unearth a theory from the data itself rather than from a predisposed hypothesis.

Earl Babbie, (Babbie, Earl. 2007) identifies the main purpose of social-science research as exploratory.
Exploratory research takes place when problems are identifiable. It is used when the topic or issue is new and when data is difficult to collect. It is flexible and can address research questions of all types (what, why, how). It is often used to generate formal hypotheses. Shields and Tajalli link exploratory research with the conceptual framework working hypothesis. Skeptics, however, have questioned its usefulness and necessity in situations where prior analysis could be conducted instead.

APPLIED RESEARCH- Applied research in administration is often exploratory because there is need for flexibility in approaching the problem. In addition there are often data limitations and a need to make a decision within a short time period. Qualitative research methods such as a case study or field research are often used in exploratory research.

THE OBJECTIVE OF EXPLORATORY RESEARCH OR FORMULATIVE RESEARCH: is to gather preliminary information that will help define problems and suggest hypotheses. (Stebbins, R. A. (2001).

THE OBJECTIVE OF DESCRIPTIVE RESEARCH: is to describe the characteristics of various aspects, such as the market potential for a product or the demographics and attitudes of consumers who buy it.

Descriptive statistics utilize data collection and analysis techniques that yield reports concerning the measures of central tendency, variation, and correlation. The combination of its characteristic summary and correlational statistics, along with its focus on specific types of research questions, methods, and outcomes is what distinguishes descriptive research from other research types.

Exploratory/descriptive research may also be CAUSAL RESEARCH: The objective of causal research is to test hypotheses of cause-and-effect relationships. If the objective is to determine which variable might be causing a certain behavior, i.e. whether there is a cause and effect relationship between variables, causal research must be undertaken. In order to determine causality, it is important to hold the variable that is assumed to cause the change in the other variable(s) constant and then measure the changes in the other variable(s). This type of research is very complex and the
researcher can never be completely certain that there are no other factors influencing the causal relationship, especially when dealing with people’s attitudes and motivations. There are often much deeper psychological considerations, that even the respondent may not be aware of. (Stebbins, R. A. (2001)

3.2 RESEARCH APPROACH: refers to the way in which the researcher plans or structures the research process. (Polit D. F., Hungler B. P., 1999).

Descriptive research projects are designed to provide *systematic* information about a social phenomena. The researcher does not *begin* with a hypotheses, but is likely to develop it after collecting data. Systematic information means careful selection of the units studied and the careful measurement of each variable. Example: The Center for Disease Control report, "Tobacco Use Among High School Students" (in Reader) is Descriptive.

In exploratory research, the researcher explores a setting, a social phenomenon. Some descriptive or explanatory studies begin with exploration. Exploratory work provides the background information needed to plan descriptive or explanatory research. Other research projects are entirely exploratory, even though they can go on for years. Example: When an operational definition is being tried out, exploratory research is being done.

In this study the researcher has used an explorative descriptive research approach. The study revolves around a Quality concept which currently is a universal ideation and may be tailored to nursing in the ICU. Still an open choice for adoption to all, the study uses a descriptive approach to systematically dwell on each aspect of Quality in nursing practice by dividing it into multiple components and allowing the nurses to go through the facts. It also explores multiple Quality nursing facts systematically through the established processes of practices, structure and the processes.

Exploratory research often relies on techniques as:

- secondary research - such as reviewing available literature and/or data.
- qualitative approaches, such as informal discussions with consumers, employees, management or competitors.
• more formal approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies.

When research aims to gain familiarity with a phenomenon or to acquire new insight into it in order to formulate a more precise problem or to develop a hypothesis, exploratory studies (also known as formulative research) come in handy. If the theory happens to be too general, a hypothesis cannot be formulated. Therefore a need for an exploratory research is felt in order to gain experience that may help in formulating a relevant hypothesis for a more definite investigation.

DESCRIPTIVE RESEARCH- As stated by Molina-Azorin, J. F., the term refers to the type of research question, design, and data analysis that is applied to a given topic. Descriptive statistics tell what is, while inferential statistics try to determine cause and effect. The type of question asked by the researcher ultimately determines the type of approach necessary to complete an accurate assessment of the topic at hand.

Descriptive studies, primarily concerned with finding out ‘what is’, might be applied to investigate the following questions:

Descriptive research can be either quantitative or qualitative. It can involve collections of quantitative information that can be tabulated along a continuum in numerical form, such as scores on a test or the number of times a person chooses to use a certain feature of a multimedia program. It can describe categories of information such as gender or patterns of interaction when using technology in a group situation.

Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection.

Descriptive studies report summary data such as measures of central tendency including the mean, median, mode, deviance from the mean, variation, percentage, and correlation between variables. Survey research commonly includes that type of measurement, but often goes beyond the descriptive statistics in order to draw inferences.

Descriptive research is unique in the number of variables employed. Like other types of research, it can include multiple variables for analysis. Yet unlike other methods, it requires only one variable. For example, a descriptive study might employ methods of
analyzing correlations between multiple variables by using tests such as Pearson's Product Moment correlation, regression, or multiple regression analysis.

The three main purposes of research are to describe, explain, and validate findings. Description follows creative exploration, and serves to organize the findings in order to fit them with explanations, and then test or validate those explanations. (Molina-Azorin, J. F. (2010).

THE NATURE OF DESCRIPTIVE RESEARCH- The descriptive function of research is heavily dependent on instrumentation for measurement and observation. Researchers may work for many years to perfect such instrumentation so that the resulting measurement will be accurate, reliable, and generalizable. Once the instruments are developed, they can be used to describe phenomena of interest to the researchers. The intent of some descriptive research is to produce statistical information about aspects of specialised subjects which may interest like-minded professionals.

There has been an ongoing debate among researchers about the value of quantitative versus qualitative research; remarks have targeted descriptive research as being pure compared to traditional, quantitative designs. One camp argues the benefits of a scientific approach to research, preferring the experimental, quantitative approach. The other camp posits the need to recognize the unique human side of research questions and prefers to use qualitative research methodology. Because descriptive research spans both methodologies, it describes events in greater or less depth as needed, and focuses on various elements of research techniques, and engages quantitative statistics to organize information in meaningful ways.

Descriptive studies can yield rich data that lead to important recommendations. The methods of collecting data for descriptive research can be employed singly or in various combinations, depending on the research questions at hand. (Janes, J. (2001).

The results of exploratory research are by themselves usually useful for decision-making, but they can provide significant insight into a given situation. Although the results of qualitative research can give some indication as to the "why", "how" and "when" something occurs, they cannot reveal "how often" or "how many".
Exploratory research is typically generalizable to the population at large.

The research approach used in this study of an exploratory, descriptive research study allows the researcher to study the facts in numerous probable situations and various numeratives as necessary for the study.

3.3 RESEARCH DESIGN:
Research Design is an overall plan of how to obtain answers to questions being studied and handle some of the difficulties encountered in the research process (Polit D F, Hungler B P, 1999).

Research Design spells out the strategies that the investigator adopts to develop information that is accurate, objective and interpretable. It is a set of flexible guidelines designed to keep the investigator in the right direction. (Polit D F, Hungler B P, 1999).

Survey research provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection with the intent of generalising from a sample population. (Creswell, J. W. (2013).

Surveys represent one of the most common types of social science research. In survey research, the researcher selects a sample of respondents from a population and administers a standardized questionnaire to them. The questionnaire, or survey, can be a written document that is completed by the person being surveyed, an online questionnaire, a face-to-face interview, or a telephone interview. Using surveys, it is possible to collect data from large or small populations (sometimes referred to as the universe of a study).

Different types of surveys are actually composed of several research techniques, developed by a variety of disciplines. For instance, the interview began as a tool primarily for psychologists and anthropologists, while sampling got its start in the field of agricultural economics. (Kacmar, K. M., & Whitfield, J. M. 2000).

Survey research does not belong to any one field and can be employed by almost any discipline. According to Angus and Katona, "It is this capacity for wide application
and broad coverage which gives the survey technique its great usefulness..." (Spradley, J. P. 1980).

In this Study a survey design was used. The inputs needed from various nursing personnel was possible with a Research Design of Survey which met the researchers’ requirement of receiving all the information needed.

The objectives of the study needed the data needed to be gathered from a competitive and professional group of practising nurses, who were knowledgeable and skilled in their own domain. Hence a survey, if administered after an in-depth search of the content, would serve the purpose to obtain the right information.

The Research Design helps the researcher in the selection of subjects for observation, and in determination of the type of analysis to be used for interpretation of the data. The selection of the Research Design depends upon the purpose of the study and the conditions under which it is conducted. (Burns, N., & Grove, S. K. 1993). It was strongly perceived that a Survey would achieve this.
The Research Design used is represented schematically as follows -

- Identify various Quality parameters which may have direct implication in nursing care
- Review literature, meet quality experts
- Identify the clinical field where the study may be considered valid
- Identify a process that can identify with the respondents, measure the target and study the feasibility
- Introduce a concept and conduct the trial
- Select the methodology to collect the information
- Present the plan, obtain the necessary permission and initiate the process
- Coordinate with respective sample, and conduct a mid evaluatory process and an end evaluatory process

**FIGURE- 3.1 SCHEMATIC REPRESENTATION OF THE RESEARCH DESIGN**

### 3.4 RESEARCH VARIABLES.

A variable is anything that has a quantity or quality that varies.

It is defined as a measurable characteristic that varies. It may change from group to group, person to person, or even within one person over time.

The common variables are:

**DEPENDENT VARIABLES**- which show the effect of manipulating or introducing the independent variables. For example, if the independent variable is the use or non-use of a new language teaching procedure, then the dependent variable might be
students' scores on a test of the content taught using that procedure. In other words, the variation in the dependent variable depends on the variation in the independent variable.

In this study Nursing Practice is the independent variable. It is guided by the Quality parameters being introduced and directs the Nursing Practice to be modified accordingly.

INDEPENDENT VARIABLES- are those that the researcher has control over. This "control" may involve manipulating existing variables (e.g., modifying existing methods of instruction) or introducing new variables (e.g., adopting a totally new method for some sections of a class) in the research setting. Whatever the case may be, the researcher expects that the independent variable(s) will have some effect on (or relationship with) the dependent variables.

In this study the Quality parameter is the independent variable. This is designed as protocol and introduced in the ICU.

EXTRANEOUS VARIABLES- are those factors in the research environment which may have an effect on the dependent variable(s) but which are not controlled.

Extraneous variables are dangerous. They may damage a study's validity, making it impossible to know whether the effects were caused by the independent and moderator variables or some extraneous factor. If they cannot be controlled, extraneous variables must at least be taken into consideration when interpreting results.

In this study the Nursing qualifications of the nurses is the extraneous variable. Nurses in the ICU have varied base line qualifications, which cannot be dictated or planned. The qualifications may have an implication on their ability and practice. This cannot be controlled but it may have an effect on the study.

The research variables in this study are classified as-

1. Quality parameters.
2. Nursing practices.
3. Qualification of the nurses.

3.5 RESEARCH QUESTION

The Research question asked by the researcher is as follows

Do nurses practice QCNP in the ICU and does it better the Nursing care patient outcomes

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3.6 SETTING OF THE STUDY:

Is the ICU at one of the well known, leading, 60 years + charitable hospital located in Mumbai. It is a tertiary care centre which caters to multi-speciality disorders. It is known for its philanthropy. Its mission to achieve quality healthcare for all aims to strengthen its principle, Act Global Think Local. Many international practices are followed and high end equipment is made available locally to enable the general population to avail the best possible medical and nursing facilities. The hospital is well known for its multiple national and international associations, collaborations and programmes, possible due to effective patient care outcomes in the medical and nursing fields. First to achieve many national and international accreditations, awards and recognitions in various healthcare sectors, this hospital has aimed to achieve higher goals. Spread over four multistorey structures it has a capacity of 420 beds and possesses state of the art equipment.

The ICU’s are spread over two levels and can nurse more than 40 patients at a time. Well equipped with the best technology, it boasts of a very patient and employee friendly Hospital Information Management System (HIMS). With a full time intensivist for each ICU who is assisted by a group of associate consultants, the patient gets prompt and efficient medical attention. A highly qualified nursing team of more than 200 nurse these patients. All of the nurses are trained in reputed institutions and possess valid registration certification to practice in Maharashtra. They go through meticulous mentoring and are closely supervised by a Nurse Manager who ensures a strict implementation of nursing practices and prompt critical decisions.

The ICUs cater to adult patients from all the medical – surgical specialities and are equipped to treat immediate postoperative patients after complex surgeries. A humanistic concern allows a relative to reside on the same floor in the adjoining facility on the same floor. This emphasises the humane concern demonstrated towards the family who may wish to be in the near vicinity of the patient.

As a multi-speciality hospital, patients with multi-organ failure, complex medical conditions or those who have undergone major surgeries are common here. As an ICU demands the nursing personnel here are needed to be ones who take critical decisions.
and have the ability to manage and multi-task between patient care activities and administrative coordination with other members of the ICU team to achieve best patient care results and successful interventional endeavour.

The ICU is in close proximity to and connected with knowledge and practiceto the bi-level Operation Theatres., Postoperative patients are transferred immediately after Recovery to the ICU where doctors and nurses maintain the continuity of care. Similarly, patients from the Catherization Laboratory, and the Accident and Emergency Unit are transferred to the ICU. The ICU also receives patients who have not stabilized after a Cardio Pulmonary Resuscitation or a Rapid Response Recovery episode. Patients with multiple/complex disorders, and those with irreversible systemic and organic infections are also admitted in the ICU.

The researcher chose this ICU for its multi-faceted nature of medically treating adult patients with the best equipment and 24-hour excellent personnel. Quality in such a setting is often not perceived to be a priority. Hence it is a challenge to know if, in such a complex scenario, feasibility of acceptance and practice may or may not be possible. There may be inconsistencies, too.

In an ICU of this stature Nursing expectations are very high and nursing abilities are judged by clinical patient care standards. This leads to a fierce competitiveness among the nurses to excel or burnout due to stress and overwork. This may have a direct impact on the quality of nursing which may reflect on the nurses’ vision to follow standards.

Quality Parameters and Indicators can be studied in any unit of the hospital, but its impact in a highly complex and multi-targeted unit is significant and the impact may be seen in the effects directly or indirectly.

The prime specialities in these units include cardiac, neuro, respiratory, infectious diseases and those dealing with organ transplants and multi-organ failure. A first to perform lung transplant, the ICU has the support system to meet multi-system medical and nursing needs within short notice.
3.7 POPULATION.
Population is any complete group with at least one characteristic features/quality in common. When looking at data, it is important to clearly identify the population being studied or referred to, so that the researcher can understand who or what are included in the data, or are who or what is of interest, as well as the type of information required from the population. Population consists of all the organisms that both, belong to the same group or species and live in the same geographical area. In research, it has a specialized meaning. Theoretically, a population is the group from which your subjects are drawn. Therefore, it is also the group that your subjects represent. Population for this study is the Nurses who are working in the ICU.

3.8 SAMPLE
The group of individuals representing the population is termed as the sample. A carefully selected sample satisfying the study criteria helps save the researcher’s time, money and effort of the researcher without jeopardizing the reliability of the findings. The sample comprises nurses working in the ICU who fulfill the inclusion criteria.

3.8.1 SAMPLE SIZE
According to P. Amritage, a sample is a subgroup of individuals in the population, usually proportionately few in number, selected so as to be to some degree representational of the population (Armitage, P. et al 1994). The ICU has more than 200 nurses whose numbers on duty vary at various times. The total number varies because of the high attrition rate of 30% due to regular resignations and continuous appointments of nurses to meet ongoing deficiencies. This also leads to nurses in the ICU possessing multi-level experience. They also belong to different age groups. These nurses also possess nursing qualifications like B.Sc. Nursing, Post Basic B.Sc Nursing, General Nursing and Midwifery Diploma or M.Sc. Nursing. All qualifications are recognised by the Maharashtra Nursing Council and the Indian Nursing Council and the nurses are allotted registration numbers through them. All the nurses employed in the ICU were female, hence the sample consisted of only female nurses. The nurses who did not meet the inclusion criteria were not considered as a part of the sample.
Also, those nurses, who met exclusion criteria were not considered. The sample was 150 nurses.

### 3.8.2 SAMPLING TECHNIQUE

Sampling refers to the strategies which enable the researcher to pick a subgroup from a large group and then use the subgroup as a basis for making inferences about the large group. (Kaul, L., 2009).

Basavanthappa (2008) states that ‘Sampling is a process of selecting a subset of a population in order to obtain information regarding a phenomena in a way that represents the entire population.’ (Basvanthappa, B.T., 2008).

According to Grove & Burns (2001), ‘A Sampling Plan is developed to increase the representativeness to decrease systematic bias and sampling error during a sample selection process.’ (Burns, N. & Grove, S., 1993).

The sampling technique used for this study was “non-probability purposive sampling”. NON-PROBABILITY SAMPLING - any methodological decision adjusts to the research question that one envisages to answer. The grounds for drawing generalizations (e.g., propose new theory/policy) from studies based on nonprobability samples are based on the notion of "theoretical saturation" and "analytical generalization". (Stebbins, R.A., 2001) instead of statistical generalization.

Researchers working with purposive sampling assert that while probability methods are suitable for large-scale studies concerned with representativeness, non-probability approaches are more suitable for in-depth qualitative research in which the focus is often to understand complex social phenomena. (Burns, N., & Grove, S. K., 1993).

The in-depth analysis of a small-N purposive sample or a case study enables the "discovery" and identification of patterns and causal mechanisms that do not draw time and context-free assumptions.

In this study the non-probability – purposive sampling was used.

PURPOSIVE SAMPLING - is based on the belief that a researcher’s knowledge about the population can be used to hand pick the cases to be included in the sample. The researcher might decide purposely to select the widest possible variety of respondents or subjects who are typical of the population in question or particularly knowledgable about the issues under study. Sampling in this manner provides no external objective method for assessing the type of selected subjects. Newly developed instruments can be effectively pre-tested and evaluated with a purposive sample of diverse types of
people. Purposive sampling is often used when the researcher wants a sample of experts, as in case of a needs assessment using the key informant approach or in surveys. (Burns, N., & Grove, S. K. 1993).
The ICU nurses employed in the adult ICU worked at multiple levels and the researcher, after an intense study, concluded that a non-probability – purposive sampling would best suit data collection and assist in meeting the study’s objectives. According to Polit D.F & Hungler, ‘Eligibility criteria are the characteristics that delimit the population of interest.’(Hungler, B. P., & Polit, D. F. 1999).

### 3.8.3 CRITERIA FOR SAMPLE SELECTION

In identifying a population, `the researcher should be specific about the criteria that define who is included. The eligibility or the inclusion criteria specifies the characteristics that the population should possess to be included in the study. The population is also defined in terms of the characteristics that people must not possess which involves stipulating the exclusion criteria.

Following inclusion and exclusion criteria were used for selecting the sample:

**INCLUSION CRITERIA:-**

1. All the nurses who were working in the ICU.
2. All the nurses who were confirmed on their positions.
3. All the nurses who were willing to participate.

**EXCLUSION CRITERIA:-**

1. All the nurses who were working in the ICU, but were not confirmed.
2. All the nurses who were not willing to participate in this study.
3.9 TOOL AND TECHNIQUE.

‘Instruments are used to gauge some quality or ability of your subjects. The purpose of the instrument is to elicit the data for the study’. (Basavanthappa, B. T. 2008).

TOOL- For this study the tool consisted of an inventory checklist – the researcher prepared a tool consisting of two parts. Part I dealt with the demographic data of the participants. Part-II was a semi-structured ‘Topic Guide’. Questions in the topic guide were decided and based on the objectives of the study to ensure response-sharing of information needed. These questions pertained to the patients’ unit and nurses’ recommendations and practices.

Research data in studies are often collected according to a structured plan that indicates what information is to be gathered and how to gather it. Here the tool consisted of a self-administered questionnaire which was highly structured. It included a fixed set of questions that had to be answered in a specific sequence and with pre-designated response options, like yes/no/cannot say/not applicable or a specific bed number in the unit to which the question was applicable. The advantage of structured questions is that they take considerable effort to develop and refine, but yield data that is specific and analyses that assists to conclude a fact. (Hungler, B. P., & Polit, D. F. 1999). When data is collected in a highly structured fashion the researcher must develop what is referred to as the Data Collection Tool. This is a formal written document such as a questionnaire used to collect and record information (Burns, N., & Grove, S. K. 1993).

In this study the tool was an inventory where the questions referred to the list of issues to be included in the data as a part of the study. The answer given were found through a checklist. This was based on the objectives of the study.

CATEGORISATION- The tool was primarily divided in two parts namely PART I and PART II.

PART I consisted of collecting base line demographic data-  
a) Qualification of the ICU nurses.  
b) Experience in years.

PART – II-A consisted of division of various factors in the ICU specific to each bed. A patient’s unit in each ICU is primarily the bed space. Factors related to Quality are space and light in various sub characteristics like their adequacy to observe crucial
factors, perform various actions, assist the primary personnel while they are being performed and presence of natural light.

This information, when processed, will be reflecting the adequacy of space and light factors for each unit in the entire ICU.

PART II B- This part of the tool involves collection of data in the category of Recommendations.

Facts.
Ability.
Practices.
Protocols.
Reports.

All the categories singly or in multiples were to collect data in various fields of Quality parameters and in the sub category of Quality Indicators. They may be summed as follows:-

- To know if, in general, light and sound recommendations are considered. ICU today is unknowingly a technically advanced unit due to its high mechanical index. This takes patients away from natural factors and Quality intends to focus on a mechanical standard along with a natural parameter.

- Ability of the caregiver to maintain atmospheric cleanliness. This is significant but extremely difficult to achieve unless an additional procedural act is maintained.

- Practice of a nurse-patient ratio (N/P) being followed. Today N/P cannot be generalised, it needs to be patient centric. This individualisation may be classified according to patients with major surgery, patients with complex disorders and multi-organ failure, on ventilators in a dependant condition or with multiple complications. N/P includes getting assistance as and when necessary, at all times, morning, evening and night.

- Protocols of utilisation of a standard parameter to detect decubitus ulcers/bed sores and reporting the same aptly. This is significantly essential in an ICU to prevent irreversible damage as the nurses attend critical illness and simultaneously use a preventive modality to decrease the patients’ length of stay (LOS) in the hospital.

- Practice of preventive protocols laid down specifically to be practiced singly or in combination and encompassing all arena is essentially a question that needs
to be answered. Through multiple methodologies, practices regarding surfaces, barriers, circulation promotion, positions and reporting facts were exercised to collect relevant facts.

• Facts on counterchecking/ensuring important occurrences/acts prior to a surgical procedure through a checklist and a protocol to report failure to do so is a Quality initiative and is checked through the data collected.

• Practices followed whilst administrating drugs via a central line is significantly important as the risk of an adverse event is greater in an ICU. Checking written/verbal orders, drug information and ensuring practice protocols of knowledge, dilution, position check, non-touch technique precautions, flushing and other precautions, are part of the tool.

• Practices for ambulation using manual or mechanical technique as a standard procedure if the patient is haemodynamically stable are reported.

• Protocols for reporting patient falls are mandatory and this is picked through the tool

• Reporting through a designated protocol for drug administration errors, as in wrong dose error, wrong time, wrong route error, wrong method error, or sending wrong patient for surgery or wrong blood for investigation.

• To know the outcome parameters in the patient care arena- The basic focus of Quality is to achieve a standard in patient care outcomes. Quality may be judged through this via various modes. The primary mode is through an interpretation by the caregiver. The caregiver has a goal to be achieved and unless that is done the process may not be considered as ended. The caregiver is a highly educated professional whose judgement may be trusted as a first hand report. This tool considers the caregiver’s input as the most valuable source of information.
TECHNIQUE- The technique used was self-reporting.
A good deal of information can be gathered by questioning people directly, a method known as self-report. The method is strong, direct and versatile. The strongest argument that can be made for the self-report method is that it frequently yields information that would be difficult, if not impossible, to gather by any other means. Self-reports are also versatile with respect to content coverage. (Grove, S. K., & Burns, N. 2005).

The self-reporting technique used in this study was through a structured approach. This included a formal written instrument known as a schedule or self-administered questionnaire (SAQ). In developing structured instruments, a great deal of effort is usually devoted to the content, form and wording of the questions. (Nieswiadomy R., 2002).

In this tool the type of questions that were used were close-ended or fixed alternative questions that offered respondents a number of alternative replies, from which the subjects had to choose the one that most closely matched the appropriate answer. Close-ended questions are difficult to construct, but are purposive in their goals. Close-ended questions are generally more efficient than open-ended questions in the sense that a respondent is normally able to complete more close-ended questions in a given amount of time. Respondents unable to express themselves easily have a distinct advantage with close-ended questions.

3.10 VALIDITY OF THE TOOL.
Validity is an appraisal of whether a test measures what it is intended to measure. Content validity is of greatest importance for a criterion referenced test. Criterion related validity checks whether the questions in a test are so framed that they really measure the stated expected behaviour.

The tool prepared for this study was shown to several experts in the fields of Quality and Nursing. The experts were asked to validate the material for its content, coverage and relevance in terms of specifications and construction of questions. The suggestions of the experts were considered and appropriate modifications were done.
To conclude, the validity of the Inventory Checklist was established using content validity by experts, and necessary changes were made.

### 3.11 RELIABILITY OF THE TOOL

Reliability concerns the degree of dependability or accuracy with which an instrument measures the attribute it is designed to measure. The reliability of an instrument may be assessed in various ways. Here the interrater reliability was used. Two nurses were asked to complete the questionnaire and give their ratings independently on different occasions. The correlation coefficient between the two sets of ratings provides an estimate of interrater reliability. In the context of reliability assessments, the correlation coefficients are referred to as reliability coefficients. Like correlation coefficients, reliability coefficients can range between -1.00 and +1.00. The higher the coefficient the greater the reliability of the instrument. Reliability coefficients generally should be at least .70.

In this case, Cohen's kappa coefficient was used to calculate the Inter-rater reliability.

**COHEN'S KAPPA COEFFICIENT** is a statistic which measures inter-rater agreement for qualitative (categorical) items. Here \( \kappa \) takes into account the possibility of the agreement occurring by chance.

Cohen's kappa measures the agreement between two raters who each classify \( N \) items into \( C \) mutually exclusive categories.

The equation for \( \kappa \) is:

\[
k = \frac{p_o - p_e}{1 - p_e} = 1 - \frac{1 - p_o}{1 - p_e}
\]

where \( p_o \) is the relative observed agreement among raters, and \( p_e \) is the hypothetical probability of chance agreement, using the observed data to calculate the probabilities of each observer randomly saying each category. If the raters are in complete agreement then \( \kappa = 1.00 \). If there is no agreement among the raters other than what would be expected by chance (as given by \( p_e \)), \( \kappa \leq 0.00 \).
In this case it was found that the correlations between the raters ranged between .86 and .98.

The reliability of the Inventory Checklist for the selected parameters was established using the Inter Rater reliability and considered as reliable to be used for the study.

3.12 PILOT STUDY.

The Pilot Study is undertaken to assess the feasibility of the planned study, the adequacy of the instrumentation and the problems of data collection. The primary objective of the Pilot Study is to test as many elements of the research proposal as possible in order to correct any part that does not work well. (Kaul, L., 2009).

According to Rose Marie Nieswidome (2002), the Pilot Study is a small scale trial run of an actual research project. Grove & Burns state that the Pilot Study is a smaller version of a proposed study conducted to refine methodology. (Grove, S. K., & Burns, N. 2005).

The purpose of the Pilot Study was to ensure that the methods used were sound and to iron out the kinks in a study protocol before launching the main experiment. The Pilot Study was conducted from August 2012 to January 2013. Prior to the Pilot Study, a proposal was presented to the management of the Hospital to obtain permission for the study. A confidentiality clause had to be signed by the researcher to respect the patients’ rights and a signed statement was submitted in accordance with the labour laws stating that employee rights would be considered and that the Pilot Study may be performed only with willing employees. Eventually the researcher presented a proposal to the Ethics Committee of the Hospital which gave the consented for the Pilot Study.

ETHICAL IMPLICATIONS IN THE STUDY - The survey was conducted amongst the nursing employees of a recognised hospital, which is governed by strict labour laws and all studies inclusive of Pilot studies had to be permitted by the Ethics committee.
For this study the ETHICS COMMITTEE recommended

- That the researcher must make their research goals clear to the members of the selected sample where they undertake their research and gain the informed consent beforehand.
- The researcher has to learn whether the group would prefer to be named in the written report of the research or be given a pseudonym, and even to offer the results of the research if the informants would like to read it.
- The researcher must ensure that the research does not harm or exploit those among whom the research is done.

In this study, all the recommendations of the Ethics Committee were incorporated when the Pilot Study was performed.

The Pilot Study was then conducted on 15 ICU nurses. The sample was selected by purposive, non-probability sampling. A written consent to participate was obtained. All the criteria of inclusion were met. Since all the nurses could not come together they participated in the study after a mutually agreed to appointment was scheduled. The nurses were briefed about the study and given enough time to self report all the questions in the tool, all the questions were answered by the nurses and none of them wanted their names to be reflected in the tool. After completion they were requested to submit the tool in a ballot box and were thanked for their time.

During this phase, the feasibility of the Inventory checklist was tested. The tool and technique were found to be feasible. No change was initiated after this and due permission to conduct the study was obtained.

3.13 DATA GATHERING PROCESS

The data collection process is an important aspect of any type of research study. Inaccurate data collection can impact the result of a study and ultimately lead to invalid results. (Babbie, Earl. 2007).

The data collection method plays an important role in impacting the evaluation by providing information to understand the process behind observed results and assess changes in the nurses’ perceptions.
DATA COLLECTION is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. The data collection component of research is common to all fields of study including physical and social sciences, humanities and business. It helps to collect the main points as gathered information. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. The goal for all data collection is to capture Quality evidence that then translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed. (Moghaddam, G. G., & Moballeghi, M. 2008).

The data gathering process was initiated after the finalised tool and proposal were approved by the Ethics Committee of the Hospital and due permissions granted. The ethical implications stated during conducting the pilot study were considered for the data gathering process.

PERIOD- The data was collected from September 4, 2013 to January 28, 2014. The process was initiated by identifying the nurses who met the inclusion criteria. Once a nurse was identified, the researcher interacted with her on a one to one basis. The nurse was explained the objective of the study and due permission from the Ethics Committee and Hospital were shared with her. All queries and doubts were clarified, after which she was asked her willingness to participate. She was assured and informed that her unwillingness to participate would be accepted and she would bear no consequences of her decision.

CONSENT- On stating her willingness to participate, she was introduced to the written consent in English. The consent was designed and modified for this study by the Ethics Committee. The nurse was requested to sign the consent which also included her wish to state or omit her name. A copy of the consent was submitted to the Ethics Committee as a pre-requisite.

PROCESS- On obtaining consent a group of five nurses at a time were contacted on the basis of their availability and requested to come in a classroom. Here they were given the structured tool Part I and Part II and each aspect of the tool was explained by the researcher. Queries and doubts if any were clarified. Once again it was emphasised by letting them know that the forms did not need them to write their names if they
wished to remain anonymous. They were then requested to take the SAQ. No time limit was set and each nurse was allowed to take the time she needed. After completion each nurse was requested to insert the tool in the given envelope, seal it and put it in a closed drop-box. Approximately 30 – 45 minutes were necessary to complete the tool. If for some reason a nurse could not complete the tool and needed to take a break and come again, she was told to seal the incomplete tool in the envelope. The seal was signed across by the nurse, the researcher and an observer. The nurse was requested to schedule another time to come and complete the tool. The data collection was completed in five months as the nurses were not able to come due the heavy work schedule. This work had to also coincide with the availability of the classroom and researchers’ availability.

DIMENSIONS OF THE DATA COLLECTION APPROACH – Data collection methods vary along four important dimensions: structure, quantifiability, researcher obtrusiveness and objectivity.

STRUCTURE- Research data in quantitative studies are often collected according to a structured plan that indicates what information is to be gathered and how to gather it. In this study an SAQ was highly structured and included a fixed set of questions that had to be answered in a specific sequence with pre-designated response options. The structured approach allows the researcher to compute the exact percentage of respondents’ response.

QUANTIFIABILITY- Data that will be subjected to statistical analysis must be gathered in such a way that they can be quantified. For statistical analysis all variables must be quantitatively measured. The data collected in this study were collected in two parts. The first was the demographic data which is easily quantifiable and the Part II was response data which again can be grouped to quantify the responses, allowing for an analysis which can conclude on the ability of the reports by the nurses.

RESEARCHER OBTRUSIVENESS- Data collection methods differ in the degree to which people are aware of their status as study participants. If participants are fully aware of their role in a study, their behaviour and responses may not be normal. When participants distort data, the entire value of the research can be undermined. In this
study the Ethics Committee decided that the data had to be collected with informed consent. Hence collection of data unobtrusively was not permitted. Distortion can be prevented by taking the necessary precautions as was done in this case, by taking strong effort to put the participants at ease, to stress the importance of candour and naturalistic behaviour and the researchers were trained to convey a neutral and non-judgemental demeanour.

OBJECTIVITY- Objectivity refers to the degree to which two independent researchers can arrive at similar scores or make similar observations regarding the concepts of interest. That is, make judgements regarding participants attributes or behaviour that are not biased by personal feelings or beliefs. Some data collection approaches require more subjective judgement than others, and some research problems require a higher degree of objectivity than others. Researchers whose paradigmatic orientation lies in logical positivism generally strive for a reasonable objectivity. In some research, the subjective judgement of the investigator is considered a valuable component of data collection because subjectivity is thought to be essential for the understanding of human experiences. In this study the data collection may be considered objective as the structured tool consisted of components which were designated and recognised by certified authorities such as the Quality Council of India, Joint Commission International, National Accreditation Board of Hospitals, etc.

DATA COLLECTION METHOD- In human sciences, a good deal of information can be gathered by questioning people directly through self-reporting. This method was used as it was important to collect data on the nurses’ perception on the practices with references to the various Quality Nursing Practices. The self-reporting method is strong with respect to its directness and versatility. If we want to know what people think, feel or believe the most direct means of gathering the information is to ask them about it. The strongest argument that can be made for the self-report method is that it frequently yields information that would be difficult, if not impossible, to gather by any other means. Self-reporting in this study was imperatively used, as versatile content had to be covered and the nurses had to report on facts which belonged to a multi-dimensional category. Self-reporting is dependent on a trust factor that the respondent is truthful. Self-reporting in this study was considered the best
methodology given the status that qualified nurses were expected to self-administer the tool.

This non-experimental study is designated as a descriptive research study hence data collection needed to meet the purpose could be met through observation, description, and documentation of the findings as they occurred, by the respondent or by a second personnel. Although there is considerable emphasis in scientific research on understanding what causes behaviours, conditions and situations, researchers can often do little more than describe existing relationships without fully comprehending the complex casual pathways that exist. Since the study did not involve any experimental manipulation of the group, factual occurrences are given prime importance and what could be termed as present versus absent is the key information that the data collection aimed at.

This data-collected, post-facto study plays a crucial role in nursing, medical and social sciences as these issues which need to be addressed are not amenable to experimentation. The extensive data-collection was possible due its descriptive nature. The study is strong in realism and has an intrinsic appeal for the solution of many practical issues. Unlike experimental studies this study will be appreciated for its factual depiction without manipulation of any variables.

To a certain extent, this study has also emerged as one where data gathering was done to evaluate and conclude a practice. This may indicate how well a program, practice, procedure or policy is working. In evaluation the research objective is utilitarian – the purpose is to answer the practical question: what decisions may be considered? For instance should a new program be adopted? Or an existing one discontinued? Do current practices need to be modified or should they be abandoned altogether? Cost may also play an important role here.
Data collection plan - described schematically as follows

1. **IDENTIFICATION OF DATA TO BE COLLECTED DONE**
   - PRIORITISED THE DATA
   - DETERMINATION THE EXTENTSIVENESS OF THE DATA COLLECTED DONE

2. **SELF REPORTING MEASURE IDENTIFIED**
   - EXISTING INSTRUMENTS = NIL
   - DEVELOPED AN INSTRUMENT
   - NECESSARY REVISION CONTEMPLATED AS NIL
   - EVALUATED THE QUALITY OF THE INSTRUMENT AS HIGH

3. **MANAGED THE DATA COLLECTION AS PER THE SUGGESTIONS AND CONVENIENCE OF THE SAMPLES**
   - VALIDITY AND RELIABILITY OF THE INSTRUMENT TESTED
   - PROCESS OF ADMINISTERING THE TOOL DETERMINED AS ETHICS COMMITTEE RECOMMENDATIONS AND FOLLOWED

**FIGURE -3.2 DATA COLLECTION**
3.14 PLAN FOR DATA ANALYSIS

Statistical analysis is a method of rendering quantitative information meaningful and intelligible. It is a systematic approach to investigations during which numerical data is collected and/or the researcher transforms what is collected or observed into numerical data. It often describes a situation or an event, answering the 'what' and 'how many' questions you may have about something. This is research which involves measuring or counting attributes (i.e. quantities).

Statistical experts guided the statistical methodology used in this study. Important factors that influenced the selection of the statistical analysis include;

- Findings that were non-descriptive, a correlation or relationship which needed to be explored and the results to be verified.
- Variables that had to be identified and studied.
- The nature of the data, which dictated that the measuring level was of particular significance as was the distribution from nominal to ratio level. The population was not normally distributed.
- The size of the sample and its composition and the fact they were independent of each other, in addition to their being unpaired.

ANALYSIS BY DESCRIPTIVE STATISTICS – It was planned to use this as the data could be summarised in a clear and orderly manner and summary statistics were to be used. The data had to be classified in the form of tables and graphs. Measurements such as percentages, averages and differentiation had to be employed and the links and correlations between data had to be considered. Data may also be reduced, classified and represented in a condensed form. (Hauke, J., & Kossowski, T. 2011).

ANALYSIS BY INFERENTIAL STATISTICS- This is needed as it comprises methods through which the information obtained from research can be generalised and applied to a larger group. This will also test differences and similarities between groups, scores and their significance, that is the extent to which differences occur by chance or can be attributed to a particular cause or condition to enable the researcher to infer or induce.
ANALYSIS BY BIVARIATE TECHNIQUES STATISTICS- This has to be used to describe the relation between the two variables. Common methods used may be correlation and regression calculation and the matrix. Matrix or the contingency table requires that the data be presented in a form of matrix. This consists of columns and rows where for each subject the scores are placed in a relevant position. Each unit shows the frequency of the score and each column respectively the percentages. On the matrix a possible connection may be traced. Correlation and regression may be used to show the relation between the variables.(Henson, R. K., & Roberts, J. K. 2006).

CORELATION BY FRIEDMAN’S- This study would be analysed for correlation using the Friedman’s test.

The Friedman test is the non-parametric alternative to the one-way ANOVA with repeated measures. It is used to test for differences between groups when the dependent variable being measured is ordinal. It can also be used for continuous data that has violated the assumptions necessary to run the one-way ANOVA with repeated measures (e.g., data that has marked deviations from normality).

When using a Friedman test, the following consideration may be used-

- One group is measured on three or more different occasions.
- Group is a random sample from the population.
- Dependent variable can be measured at the ordinal or continuous level.

Examples of ordinal variables include Likert scales (e.g., a 4-point scale from agree through to disagree), amongst other ways of ranking categories (e.g., a 3-point scale explaining how much a customer liked a product, ranging from "Not very much" to "Yes, a lot"). Examples of continuous variables include revision time (measured in hours), intelligence (measured using IQ score), exam performance (measured from 0 to 100), weight (measured in kg), and so forth.
- Samples do NOT need to be normally distributed.
The Friedman test procedure in statistics will not test any of the assumptions that are required for this test. This is because the assumptions are a methodological or study design issue, and not what statistics is designed for. (Friedman, M. (1940).

FRIEDMAN’S COMPUTED KENDALL- There are two ways of computing Kendall’s W statistic (first and second forms of Equations 1 and 2); they lead to the same result. S or S0 is computed first from the row-marginal sums of ranks Ri received by the objects.

\[ S = \sum_{i=1}^{n} (R_i - \bar{R}) \] or \[ S' = \sum_{i=1}^{n} R_i^2 = SSR, \]

where S is a sum-of-squares statistic over the row sums of ranks Ri, and R is the mean of the Ri values. Following that, Kendall’s W statistic can be obtained from the following formulae:

\[ W = \frac{12S}{m^2(n^3-n) - mT} \]

or

\[ W = \frac{12S' - 3m^2(n+1)^2}{m^2(n^3-n) - mT} \]

where n is the number of objects and m is the number of variables. T is a correction factor for tied ranks:

\[ T = \sum_{k=1}^{g} (t_k^2 - t_k) \]

in which tk is the number of tied ranks in each (k) of g groups of ties. The sum is computed over all groups of ties found in all m variables of the data table. T . 0 when there are no tied values. Kendall’s W is an estimate of the variance of the row sums of ranks Ri divided by the maximum possible value the variance can take; this occurs when all variables are in total agreement. Hence 0≤W≤1, 1 representing perfect concordance. To derive the formulas for W (Equation 2), one has to know that when all variables are in perfect agreement, the sum of all sums of ranks in the data table (right-hand column of Table 1) is mn.n . 1.=2 and that the sum of squares of the sums of all ranks is m2n(n.1)(2n.1)/6 (without ties). (Kendall, M. G., & Smith, B. B. (1939).

This will reflect the correlation between the parameters and amongst them too.
3.15 SUMMARY
After a brief introduction, the researcher has given the short overview of the pilot study done before conducting the final main study. This is followed by detailed description of the research approach and the research design. The same has also been represented in the schematic form. The variables of the research and setting where the study has been conducted are mentioned. The researcher has also discussed about population, samples and sampling techniques used. The tools developed to collect data and the process of collecting it with the help of these tools has been discussed in detail. The researcher has mentioned about the plans for the data analyses in this chapter and has mentioned that the actual data analysis is described in the next chapter.
REFERENCES


