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A Study to Examine the Medication Error, Causes and Reporting Behaviour as Perceived by Staff Nurses Working in the Selective Units of Dr. Ram Manohar Lohia Hospital, New Delhi

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Sonia Arora[1], Gurmeet Kaur Bagga[2], Koushal Dave[3]

Abstract

Medication errors may occur at any stage of prescribing, demonstrating, dispensing, preparation and administration. Medication errors can contribute to morbidity, mortality and increased health care cost. The aims of this study was to find the causes of medication errors, perceptions of staff nurses towards medication errors and identify the difference between I.C.Us and ward nurses with regard to perception of medication error in the selected units of Dr. R.M.L hospital. Quantitative Cross-sectional survey approach was selected. All the registered nurses who were working in the medical, surgical, paediatric ward and I.C.Us of Dr. R.M.L hospital and fulfilling the inclusion criteria were enrolled for this study. Non probability convenient sampling was done and 100 staff nurses were enrolled for study. Study results found that participants from the selected units of Dr R.M.L. Hospital are aware about the causes of medication errors and majority of them have a common view about reporting medication errors i.e. it has to be reported to the nurse manager but there was no incidental report or any other written document exists with the Nurse Manager indicating occurrence of medication errors.

Keywords: Medication errors; Morbidity; Mortality.

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Introduction

Medication misadventure can occur anywhere in the health care system from prescriber to dispenser to administration and finally to patient use, the simple truth is that many preventable errors are preventable. The subject of medication error has received more National attention recently than other time.[1] Pharmacist has long history of conducting research on medication errors, starting 40 years ago with a study that demonstrated errors are a much bigger problem than anyone realised. Medication errors may occur at any stage of prescribing, demonstrating, dispensing, preparation and administration.[2] Medication errors can contribute to morbidity, mortality and increased health care cost. In 2007 National Patient Safety Agency (NPSA) statistics shows that 59.3% of medication errors occur during administration to patient.[3]

Administration errors: If the drug that the patient got is different from the drug prescribed by the physician there comes the administration errors. It includes even taking of the expired drugs.[4] When the IV is the route of the administration the professionals should be more careful as the administration causes severe consequences.

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Avoiding: We can avoid this by verifying the patient details and make sure that the patient and prescription and drugs are present at one place.[5] Before administering the drug, other health care professional should check dose in order to avoid mistakes.[6]

Approximately 7000 death occurs each year and medication error occurs in just about 1 of every 5 doses given in the Hospital. There is at least 1death per day and 1.3 million people are injured each year due to medication error.[7] No study has been conducted in the past on nurse's perception about Medication Errors at Dr. R.M.L. Hospital, New Delhi. So results from this study will help us to know better perspectives about medication errors and recommendations that can be made for the prevention.[8]

Objectives of the study

(i) to find the causes and perceptions of staff nurses towards medication errors of medication errors in the selected units of Dr. R. M. L hospital

(ii) to identifying the difference between I.C.Us and ward with regard to medication error reported to sister in charge

(iii) to make recommendations of quality nursing service for preventing medication error

Materials and Methods

Research Design

Quantitative cross-sectional survey research approach was selected.

Setting

Present study on causes and nurses perception about medication error has been conducted in the selected units of R.M.L. Hospital which was formerly known as Willington Hospital in New Delhi has 984 beds. The hospital was originally founded, with only 54 beds, in the early 20th century by the British Raj for their government staff. In 1954, in the newly independent India, control of the hospital transferred to the Central Government's Ministry of Health and Family Welfare.

Sample and sampling method

All the registered nurses working in the medical, surgical, paediatric ward and I.C.Us of Dr. R. M. L hospital and fulfilling the inclusion criteria were enrolled. Staff nurses working in the selected units of Dr. R. M. L. Hospital, minimum period of 1 year experience and involved in the administration of medication were included. Non probability convenient sampling was selected and 100 staff nurses were enrolled for this study.

Measures

The Modified Gladstone survey was used to collect data for this study. This instrument measured: Nurses perceived causes of medication error (10 items), Percentage of drug errors reported to nursing sister (1 item), Types of incident that would be classified as Medication errors/Reportable to physicians o/Reportable using an incident report (6 items), Nurse views about reporting medication errors (6 items) and Nurses biographical data. Tool for the study is standardized. Instrument content validity was determined acceptable by Osborne, Blains, and Hayes (1999) and Gladstone (1995). In addition, Osborne et al established reliability using the test and retest method in their sample.

Results

According to the Table 1 maximum 40–60% i.e. (28) nurses reports to the Nurse Manager but there is no incidental report existing with the Nurse Manager showing the actual record.

According to the Table 2 the given situation in the tool majority of the Nurses were able to rule out drug error, whether to notify physician and do incident reporting. But in some situations they were not able to rule out which have serious implications which should be considered.

Table 1: Nurses perception regarding medication error.

% of all drug errors is reported to the nurse manager by the completion of an incident report	Frequency
0–20	16
20–40	27
40–60	28
60–80	22
80–100	7

Table 2: Nurses perception about medication error

Perception of nurses	Drug error		Notify physician		Incident report	
	Yes	No	Yes	No	Yes	No
1. Patient's misses his mid-day dose	56	44	90	10	78	22
2. Doses of iv antibiotics four hours late.	84	16	70	40	88	12
3. A patients receiving TPN feeding via an infusion pump is given 200 ml/ hour instead of Correct rate of 125 ml/hour for the first 4 hours of the 24 hours infusion.	75	25	74	20	86	14
4. A patient admitted with status asthmaticus on 08/13/97 at 2 a.m. Is prescribed ventolin nebulizers every four hours. The nurse omits the 6 a.m. Dose on 08/13/97 as the patient is a sleep.	70	30	64	36	79	21
5. A physician orders perpocet 1–2 tabs for postop pain every 4 hours. At 4 p.m. The patient complains of pain, request one pill and is medicated. At 6.30 pm the patient requests the second pain pill. The nurse administers the pill.	65	45	60	40	72	28
6. A patient is receiving a routine 9 a.m. Dose of digoxin every day. Yesterday's digoxin label was 1.8 (the high side of normal). A digoxin label was drawn at 6 a.m. Today. At 9 a.m. The nurse holds the digoxin because the lab value is not available at.	41	45	41	69	84	14

According to table 3 ICU nurses are more aware of medication errors as compared to Ward Nurses. Majority of the participants were in the age group of 25–45 and were female and had diploma in nursing and working on full time basis in rotation of three shifts and were medical ward. According to Nurses perception out of 10 causes, 2 causes i.e. (D–Drug errors occur when there is confusion between two drugs with similar names and E-Drug errors occur when the physician prescribes the wrong dose) are the most frequent cause of medication error. 1 out of 10 causes i.e. (drug errors occur when nurses are tired and exhausted) is the least frequent cause of medication error. Maximum 40–60% nurses reports to the senior nurse-incharge but there is no incidental report existing with the senior nurse incharge-showing the actual record. Majority of the Nurses were able to rule out drug error, whether to notify physician and do incident reporting. But in some situations they were not able to rule out which have serious implications which should be considered. ICU nurses are more aware of medication errors as compared to Ward Nurses. Ward nurses are able to notify physician but no incident report exist with the nurse manager. So, that there is lacking on the part of reporting medication error.

Table 3: Nurses views about reporting medication error

Views of nurses	ICU		Ward	
	Yes	No	Yes	No
1. I am usually sure what constitutes a medication error.	84	16	77.4	22.7
2. I am usually sure when a medication errors should be reported using an incident report.	100	0	8	92
3. Some medication errors are not reported because nurses are afraid of reaction they will receive from the nurse manager.	80	20	9.4	90.7

(Contd.)

Views of nurses	ICU		Ward	
	Yes	No	Yes	No
4. Some medication errors are not reported because nurses are afraid of the reaction they will receive from the co-workers.	48	52	82.7	17.4
5. Have you ever fail to report a drug error because you did not think the error was serious to warrant reporting?	76	24	62.7	47.7
6. Have you fail to report a medication error because you were afraid that you might be subject to disciplinary action or even lose your job.	84	16	67.7	47.7

Discussion

Nurses are assumed as a noteworthy part in diminishing prescription mistakes and much of the time direct medications in patients' social insurance settings (Hsaio G.Y, et al., 2010).[9] In the same vein, they are the last to defend against pharmaceutical mistakes (Despins L.A, et al., 2010).[10] Reasons behind the errors' occurrence were reported as the following based on the present study: no easy look up information on medication errors, illegible medication order, similar medication for many patients, look-alike medicines, frequent substitution of drugs and the pharmacist's unavailability for 24 hours. Be that as it may, in another overview directed via Cohen et al. (2003), five notable explanations behind what initiated or expanded the danger of pharmaceutical mistakes were stated; diversions and intrusions amid MA, lacking staffing and high nurse/patient proportions, unintelligible prescription requests, mistaken measurements count and comparative medication names and bundling (Cohen H, et al., 2003).[11]

Consequently, the Joint Commission distributed a list of {lookalike/sound-alike} medications that are viewed as the utmost dangerous pharmaceutical terms crosswise over locations. The investigation was led by Mrayyan et al. in 2007 upheld this discovery and recommended that the medicines' names and bundles might be incomprehensibly the social insurance work force due to putting essential data unmistakably and little text dimension of showing content, which may prompt poor comprehensibility (Mrayyan M.T, et al., 2007).[12] The consequences of the factor examination uncovered distinctive classifications of reasons for why medication administration errors remain unreported that were distinguished in this study. These classes include, expectation that administration of medicine by nurses will be accurate, error definition reasons, fear from the patient, family, physician and nursing administration, errors is not important enough to be reported and no positive feedback is given by patients.

Conclusion

According to the results of the study all the study participants i.e. staff nurses from the selected units of Dr R.M.L. Hospital are aware about the causes of medication errors and majority of them have a common view about reporting medication errors i.e; it has to be reported to the nurse manager but there was no incidental report or any other written document exists with the Nurse Manager indicating occurrence of medication errors.

Limitations

The study was limited to a Dr. R.M.L. Hospital which restricts the applications of the findings. Study was limited to selective units of Dr. R.M.L. Hospital. The study sample was chosen conveniently. The study sample was limited to 100 staff nurses.

Recommendations

Recommendations for Nurse Manager for monitoring and managing medication error

- Conducting regular session of planned clinical demonstration of medication administration with the staff nurses.
- Conducting various teaching sessions and research studies on the different aspects of medication error for staff nurses.
- There should be the written guidelines for diluting and administering medication and Nurse Manager should have it so that it can

be referred whenever required.

- The nursing manager should take initiative to supervise staff nurses related to medication administration.
- All nurse managers should maintain records of incidental reports about medication error occurring and take necessary action so that same error should not be repeated.
- Nurse Manager should encourage their staff nurses to report medication error without any fear of losing job or disciplinary action. Medication errors should be identified and documented their causes studied in order to develop systems that minimize recurrence. Several error monitoring techniques exist (e.g.anonymous self-reports, incident reports, critical incident technique, and disguised observation technique) and may be applied as appropriate to determine the rates of errors.
- Monitoring programs for medication errors should consider the following risk factors:

1. Work shift (higher error rates typically occur during the day shift).
2. Inexperienced and inadequately trained staff.
3. Medical service (e.g., special needs for certain patient populations, including geriatrics, pediatrics, and on-cology).
4. Increased number or quantity of medications per patient.
5. Environmental factors (lighting, noise, and frequent interruptions).
6. Staff workload and fatigue.
7. Poor communication among health-care providers.
8. Dosage form (e.g., inject able drugs are associated with more serious errors).
9. Type of distribution system (unit dose distribution is preferred; floor stock should be minimized).
10. Improper drug storage.
11. Extent of measurements or calculations required.
12. Confusing drug product nomenclature, packaging, or labeling.
13. Drug category (e.g., antimicrobials).
14. Poor handwriting.
15. Verbal (orally communicated) orders.
16. Lack of effective policies and procedures.
17. Poorly functioning oversight committees

Recommendations for Nurses

- Nurses who practice in organized health-care settings should be familiar with the medication ordering and use system.
- All drug orders should be verified before medication administration.
- When standard drug concentrations or dosage charts are not available, dosage calculations, flow rates, and other mathematical calculations should be checked by a second individual (e.g., another nurse or a pharmacist)
- Patient identity should be verified before the administration of each prescribed dose. When appropriate, the patient should be observed after administration of the drug product to ensure that the doses were administered as prescribed and have the intended effect
- All doses should be administered at scheduled times unless there are questions or problems to be resolved. Medication doses should not be removed from packaging or labeling until immediately before administration. The administration of medication should be documented as soon as it is completed.
- The drug distribution system should not be circumvented by "borrowing" medications from one patient (or another hospital area) to give to a different patient or by stockpiling unused medications
- If there are questions when a large volume or number of dosage units (e.g., more than two tablets, capsules, vials, or ampoules) is needed for a single patient dose, the medication order should be verified. Consult with the pharmacist and prescriber as appropriate.
- All personnel using medication administration devices (e.g., infusion pumps) should understand their operation and the opportunities for error that might occur with the use of such devices.
- Nurses should talk with patients or caregivers to ascertain that they understand the use of their medications and any special precautions or observations that might be indicated. Any counseling needed should be provided before the first dose is administered, when possible.

- When a patient objects to or questions whether a particular drug should be administered, the nurse should listen, answer questions, and (if appropriate) double check the medication order and product dispensed before administering it to ensure that no preventable error is made (e.g., wrong patient, wrong route, and dose already administered). If a patient refuses to take a prescribed medication, that decision should be documented in the appropriate patient records.

Recommendations related to wrong prescriptions

- Active interventions aimed at reducing prescription errors and prescribing faults are strongly recommended
- These should be focused on the education and training of prescribers and the use of on-line aids.
- The complexity of the prescribing procedure should be reduced by introducing automated systems or uniform prescribing charts, in order to avoid transcription and omission errors.
- Feedback control systems and immediate review of prescriptions, which can be performed with the assistance of a hospital pharmacist, are also helpful.
- Audits should be performed periodically.
- Improving quality of written prescriptions in a general hospital.
- Intervention strategies should be primarily focused on education and the creation of a safe and cooperative working environment, to strengthen defence systems and minimize harm to the patient.
- The FDA, is encouraging people to talk with their physicians to ensure that they have a complete understanding about their prescription before leaving the doctor's office, and to verify the information with the pharmacist before the medication is dispensed.

Recommendations related to confusion of similar names of medicines

- The NCCMERP recommendations encourage doctors to write both brand and generic names on prescriptions.
- Generic name confusion also has led to regulatory action, as well as to pharmacy practice recommendations.

Organizational and Departmental Recommendations

- Organizational policies and procedures should be established to prevent medication error.
- Development of the policies and procedures should involve multiple departments, including pharmacy, medicine, nursing, risk management, legal counsel, and organizational administration.

Recommendations for Pharmaceutical Manufacturers and Approval Organization

- Look-alike or sound-alike trademarked names and generic names should be avoided.
- Similar proprietary appearances of packaging and labeling should be avoided, because look alike products contribute to medication error
- Supervisors, department managers, and appropriate committees should periodically review error reports and determine causes of errors and develop actions to prevent their recurrence (e.g., conduct organizational staff education, alter staff levels, revise policies and procedures, or change facilities, equipment, or supplies.
- Special instructions should be highlighted on labeling such as the need for dilution before administration
- The most prominent items on the product label should be information in the best interest of safety (e.g., product name and strength). Less prominence should be given to company names or logos.
- Drug manufacturers are encouraged to make dosage forms available commercially in unit dose and unit of-dispensing containers, as well as bulk packaging, to facilitate their appropriate use in all practice settings.
- Drug manufacturers must communicate with health-care providers (i.e., pharmacists, physicians, and nurses) when changes are made in product formulations or dosage forms.

Recommendations were offered for the future research

- A similar study can be replicated in a large sample to validate data and generalize the findings.

- A similar study can be done taking more than one Hospital.
- A similar study can be done by using Hindi data for whom unable to understand English.
- A similar study can be taken by involving staff nurses regardless of specifying selective units.
- A follow up study can be done to compare the efficiency in the services provided and efficiency in the practice.

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Effects of Mirror Therapy on Upper Extremity Functions among Hemiplegic Patients: An Experimental Study

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Koushal Dave

Abstract

*Background***:** Hemiplegia is one of the most common and undesirable consequences of stroke. The disability in daily life is of longer duration for paralysis of the upper extremity than the lower extremity. This study was conducted to assess the effectiveness of mirror therapy on upper extremity functions among hemiplegic patients. *Methods:* Quantitative pre-test post-test control group design was used. Hundred patients visiting outpatient department of Dr. R.M.L. Hospital, New Delhi were randomly assigned to either of two groups: experimental group and control group. Subjects in experimental group received mirror therapy along with physiotherapy and subjects in control group received physiotherapy only. Demographic related data was collected and upper extremity functions of hemiplegic patients were assessed by using the Manual Function Test (M.F.T.) tool. Data analysis was done by using STATA 11.1 with level of the significance < 0.05. *Results:* The mean upper extremity function score was significantly ($p < 0.001$) higher among subjects of experimental group (20.35 ± 4.90) after intervention of mirror therapy with physiotherapy in comparison to subjects of control group (10.65 ± 4.56) who received only physiotherapy. Significant improvement in upper extremity function was found among subjects with brain injury and subjects with higher education level. *Conclusion:* It is concluded that mirror therapy is relatively cheap intervention with notable improvement in upper extremity functions among hemiplegic patients. An improved upper extremity function ultimately creates a positive effect on early recovery of hemiplegic patients' without any complications associated with hemiplegia.

Keywords: Mirror therapy; Hemplegia; Upper extremity function; Stroke.

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Introduction

Stroke is a global epidemic and an important cause of morbidity and mortality. Stroke remains the leading cause of disability and third leading cause of death among adults in the United States of America.[1] In India, stroke is the second commonest cause of death and the most common cause of disability.[2,3] According to a recent study published in the Journal of stroke, the prevalence rate of strokes is 84 to 262 per 100,000 populations in rural India and 334 to 424 out of 100,000 populations in cities.[4] Hemiplegia is one of the most common and undesirable consequences of strokes. It has been reported that up to 85% of stroke survivors experience hemiparesis and 55%–75% continue to have limitations in upper extremity function.[5]

Mirror therapy is a relatively new approach in rehabilitation used in different neurological disorders including stroke.[6] Mirror therapy is a drug free treatment and has been described in literature to be of benefit to 80% of users, some even report numbers as high as 95%.[7] Mirror therapy is a form of motor imagery in which a mirror is used to convey visual stimuli to the brain through observation of one's unaffected body part as it carries out a set of movements.[8] Mirror therapy

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technique utilizes the mirror-illusion which is created by the movement of sound limb that is perceived as the paretic limb.[9]

Altschuler et al.[10] demonstrated improvement of movements in terms of range of motion, speed and accuracy in post stroke patients who underwent mirror therapy. Yavuzer et al.[6] reported that mirror therapy in addition to a conventional rehabilitation program was beneficial in terms of motor recovery and upper limb functioning. These studies suggest that mirror therapy leads to better functional recovery of the upper extremities than does conventional therapy. Thieme H et al.[11] was found to improve activities of daily living, significant positive effect on pain and motor function with mirror therapy. Objective of the study was to assess effectiveness of mirror therapy on upper extremity functions among hemiplegic patients.

Materials and Methods

Experimental pretest post-test control group design was used. All hemiplegic patients with upper extremity dysfunction of less than six months and who visited Physiotherapy OPD, Neurology OPD and department of Physical Medicine and Rehabilitation of Dr. R.M.L. Hospital, New Delhi were enrolled. Ethical clearance for the study was obtained from institute Ethics Committee.

Sample and Sampling technique

Total 100 subjects who met the eligibility criteria were randomly allocated to two groups: control group (50) and experiment group (50). Subjects in experimental group received mirror therapy along with physiotherapy and subjects in control group received only physiotherapy.

Participant's Eligibility Criteria

Patients with left or right hemiplegia, normal visual perspective function and normal mental status were included. Subjects with physical disability of upper extremity, quadriplegia, any mental disorder and had recently undergone brain surgery were excluded from this study.

Measures

(1) *Tool 1*: A structured tool including the demographic and clinical data was prepared to collect data from subjects using interview technique. The tool had 15 items dealing with demographic and clinical data of the subjects.

(2) *Tool 2*: Manual Function Test (MFT): This is a standard tool to assess upper motor function. It was made in 1987 in Japan by R. Nakamura and S. Moriya. The MFT was developed to examine unilateral upper-limb motor function in hemiplegic patients with paralysis. It includes a task in following categories: arm motion, grasp and pinch, arm and hand activities. The MFT score can range from 0 (severely impaired) to 32(full function).

Various activities like forward (FE) and lateral elevation (LE) of upper extremity, touch the occipital with palm of affected side (PO), touch the dorsum with affected hand (PD), grasp the ball and hold it up, pinch, carry a cube (CC) and peg-board (PP) were performed during MFT. Validity and reliability of MFT is already established with internal consistency and a reliability coefficient of 0.95.

Intervention

The principle of mirror therapy is to use mirror to create a reflective illusion of movement of the affective limb. Sitting position was provided to patients. Face mirror (60 × 30 cm) was placed vertically in saggital plane on desk. The paretic hand was placed behind the mirror and non paretic hand was placed in front of mirror such that reflection of paretic hand creates illusion in patient's head such that his affected hand is responding. The therapy was given to hemiplegic patients twice a week in OPD for 30 days. Patients in experimental group were motivated to perform this exercise daily at home for thirty minutes and follow up was done by providing a diary to each patient for maintaining regularity of mirror therapy.

Procedure for data collection

Data was collected from November 2018 to May 2019. All the hemiplegic patients who visited OPD of Dr. R.M.L. hospital and met the inclusion criteria were enrolled in study. Random assignment to either of the two groups: experimental and control groups was done based on randomization table. A letter explaining the purpose of the study was given to the subjects. Signed informed consent was taken from the subjects. Demographic related data was collected by interview technique using questionnaire. Pre-test assessment of upper extremity function was done by using MFT from both the groups. The Intervention of mirror therapy along with physiotherapy was given to subjects of

experimental group for thirty days whereas control group only received physiotherapy. The therapy was given to hemiplegic patients twice a week for 30 days. Subjects in experimental group were motivated to perform mirror therapy along with physiotherapy for thirty minutes daily at home and follow up was done by providing a diary to each patient for maintaining regularity of mirror therapy. Post-test assessment of both the groups was done using Manual Function Test (MFT) tool after 30 days of follow-up.

Results

Demographic Characteristics

Mean age of the subjects was 55 years in both the groups. Majority of subjects in both the groups were male 65% & 55% respectively. 35% of subjects had education level of graduation in experimental group whereas in control group 35% subjects had obtained primary level education. Approximately 55% subjects were employed and equal percentage of the subjects in both the groups had monthly income more than ₹10,000. In both the groups, majority of subjects were diagnosed with hypertension followed by brain injury.

Comparison of pretest and post-test upper extremity function scores

Table 1 shows that mean pre-test PO function score (touch the occipital with palm of affected side) in experimental group was 1.35 ± 0.81 and in control group PO score was 0.90 ± 0.64. GR (grasping) mean function score was 1.40 ± 0.68 in experimental group and 1.95 ± 0.68 control group. In both the groups, PP (peg board) function score was 1.30 ± 0.80 and 0.90 ± 0.71 respectively.

Table 1: Comparison of pre-test and post-test MFT scores of upper extremity function in experimental and control group

UEF	Pre-test score		Post-test score	
	Experimental group (Mean ± SD)	Control group (Mean ± SD)	Experimental group (Mean ± SD)	Control group (Mean ± SD)
FE	1.85 ± 0.74	1.80 ± 0.83	3.90 ± 0.71	2.05 ± 0.68
LE	1.65 ± 0.81	1.50 ± 0.68	3.55 ± 0.75	1.65 ± 0.67
PO	1.35 ± 0.81	0.90 ± 0.64	2.95 ± 0.68	1.05 ± 0.82
PD	0.90 ± 0.71	0.60 ± 0.82	3.10 ± 0.64	0.55 ± 0.75
GR	1.40 ± 0.68	1.95 ± 0.68	2.50 ± 0.68	2.05 ± 0.68
PI	1.10 ± 0.64	1.30 ± 0.86	2.55 ± 0.82	1.60 ± 0.75
CC	1.05 ± 0.68	1.15 ± 0.67	2.40 ± 0.82	1.35 ± 0.81
PP	1.30 ± 0.80	0.90 ± 0.71	3.40 ± 0.99	0.95 ± 0.75

UEF: Upper extremity function, FE- Forward elevation of the upper extremity, LE -Lateral elevation of upper extremity, PO- Touch the occipital with palm of affected side, PD - Touch the dorsum with affected hand, GR - Grasp the things, PI - pick up things, CC - pick wooden cubes, PP - Peg board.

Mean post-test LE (lateral elevation of upper extremity) function score in experimental group was 3.55 ± 0.75 as compared to control group 1.65 ± 0.67. PD (touch the dorsum with affected hand) function score was 0.55 ± 0.75 in control group and 3.10 ± 0.64 in experimental group. Post-test PP (peg board) mean function score was 3.40 ± 0.99 in experimental group whereas 0.95 ± 0.75 in control group.

Upper extremity function score of FE (Forward elevation), LE (Lateral elevation), PD (Touch the dorsum with affected hand), PP (Peg board) were significantly improved in experimental group after intervention of mirror therapy along with physiotherapy compared to control group.

Effects of mirror therapy on upper extremity function

As shown in Fig. 1, mean pre-test upper extremity function score was 10.60 ± 4.74 and mean post-test upper extremity function score was 20.35 ± 4.90 after intervention of mirror therapy along with physiotherapy among subjects of experimental group with $p < 0.001$. Whereas, in control group mean pre-test upper extremity function score was 10.10 ± 4.66 and mean post-test upper extremity function was 10.65 ± 4.56 with physiotherapy ($p = 0.058$). Significance effect of mirror therapy along with physiotherapy on upper extremity function score was seen in experimental group ($p < 0.001$). Thus, mirror therapy along with physiotherapy has highly significant effect in improving upper extremity function among hemiplegic patients compared to physiotherapy.

Study results also found that subjects in the age group of 26 to 35 years had significantly higher ($p < 0.004$) upper extremity function score than the older age group. Moreover, the subjects with

higher educational status had comparatively better upper extremity function than the lower educational status. Subjects with brain injury showed significantly higher (p < 0.001) upper extremity function score after intervention of mirror therapy 16.00 ± 3.84 than the subjects with disorders like spinal injury, diabetes and hypertension.

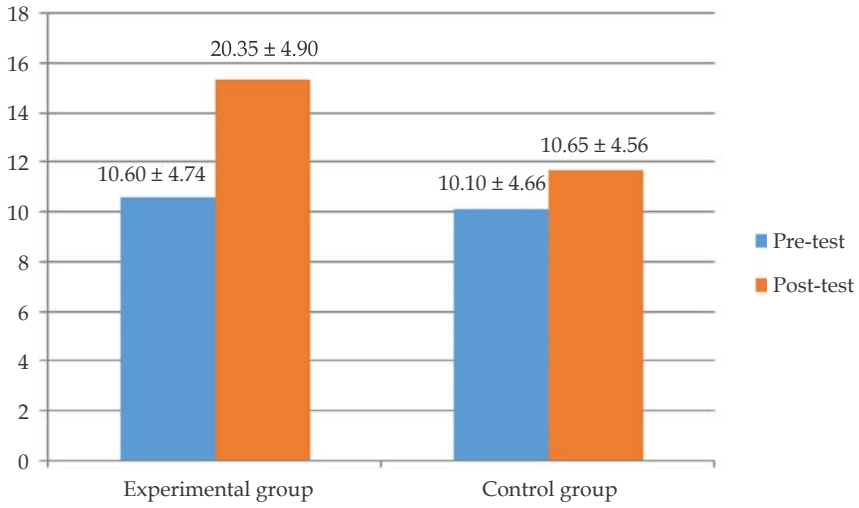

Fig. 1: Comparison of upper extremity function score of experimental and control group.

Discussion

Mean pre-test upper extremity function score was 10.60 ± 4.74 and post-test upper extremity function score was 20.35 ± 4.90 after intervention of mirror therapy along with physiotherapy among subjects of experimental group (p < 0.001). Whereas, in control group mean pre-test upper extremity function score was 10.10 ± 4.66 and mean post-test upper extremity function was 10.65 ± 4.56 with physiotherapy (p = 0.058). Significance effect of mirror therapy along with physiotherapy on upper extremity function score was seen in experimental group (p < 0.001).

The findings of this study were also supported by Zeng W, Guo Y, Wu G, Liu X, Fang Q. (2018)[12] conducted study to evaluate the mean treatment effect of mirror therapy on motor function of the upper extremity in patients with stroke. A moderate effect of mirror therapy on motor function of the upper extremity was found.

These findings were congruent to the findings of the study conducted by Choi HS, Shin WS, Bang DH (2019)[13] mirror therapy using gesture recognition for upper limb function, neck discomfort and quality of life after chronic stroke. Mirror therapy is an intervention that improves upper-extremity function, neck Bai discomfort, and quality of life in patients with chronic stroke.

The above findings were similar to the study conducted by Bruchez R, Jequier Gygax M, Roches S, Fluss J, Jacquier D, Ballabeni P et al. (2016)[14] to determine the efficacy of mirror therapy in children with hemiparesis. Significant improvements was found in grasp strength, pinch strength, upper limb function in terms of accuracy and fluency as well as daily performance.

Limitation

Study involved only subjects who visited OPD, conducted in single setting with small sample size.

Implications

Nursing practice: Mirror Therapy can be used as an adjuvant therapy to improve the upper extremity functions among hemiplegic patients. Nurses in the OPD settings can be encouraged to use mirror therapy for hemiplegic patients to improve upper extremity function.

Nursing administration: Facilities should be made available in hospital settings for using Mirror Therapy for hemiplegic patients visiting OPD to improve their upper extremity functions. In-service education should be conducted for the nursing personnel as well as for the other hospital staff to utilize rehabilitative intervention like mirror therapy to improve the upper extremity function among hemiplegic patients.

Nursing research: Nurses can conduct further research on the effect of Mirror Therapy on upper extremity functions in all the other settings of the hospital with larger sample size.

Conclusion

Based on the findings of the present study it is concluded that upper extremity functions were improved after intervention of mirror therapy along with physiotherapy among hemiplegic patients. Mirror therapy could be used as an acceptable intervention and alternative to medications for patients when appropriate.

Recommendations

A multicentre study with a larger sample size can be undertaken. Intervention of mirror therapy can be given for longer period of time and duration. Effectiveness of Mirror Therapy may be assessed in other clinical areas of hospital.

Conflict of Interest

Authors declare no conflict of interest

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Orignal Article

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Video Assisted Learning Package Regarding Sensory Deprivation on Knowledge, Attitude and Practice of Staff Nurses in ICU

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Rexy CD[1], Sr. Salini SG[2], Shirley Prakash[3]

Abstract

Background of the Problem: The literature reported that patients are exposed to and react to stimuli that are unique to Intensive Care Unit settings. Egerton and Kay, 1964; Hale, Koss, Keistan, Camp Barash, 1977; Kornfeld, 1971 reviewed that 25–40% of ICU patients experience identifiable psychological upsets in response to stimuli from the critical acre environment.

Methods: A pre- experimental approach with one group, pre-test – intervention – post-test design was used in this study. The study was conducted in four major hospitals in Thrissur District, namely Westfort Hospital, Mother Hospital, Aswini Hospital and Daya Hospital. The investigator collected data regarding level of sensory deprivation from 20 patients selected using simple random technique (Group I), admitted in ICU, using check list prepared by the investigator. The investigator selected 50 samples fulfilling the inclusion criteria and exclusion criteria, by using simple random technique. The intervention was in the form of VALP (Video Assisted Learning Package).

The tools used were: Structured questionnaire to assess demographic variables. Check list to assess the level of sensory deprivation. Structured questionnaire to assess the level of knowledge of staff nurses regarding sensory deprivation in patients admitted in ICUs. Scale to assess the attitude of staff nurses regarding sensory deprivation in patients admitted in ICUs. Observation check list to assess nurse's practice focusing sensory deprivation in caring patients admitted in ICUs. Video Assisted Learning Package was administered to study subjects starting from the second day of the pre–test administration. After 7 days of intervention, post–test was administered. Two days after completing post–test, the investigator went to study settings and level of sensory deprivation of 20 patients admitted in ICUs (Group II), selected by simple random sampling technique were observed using the check list.

Results: The findings ofthe study revealed that the knowledge, attitude and practice of staff nurses working in ICUs had improved significantly by VALP at 0.001 level of significance. Sensory status of the patients admitted in ICUs has significantly improved after the intervention given to the staff nurses. There was significant association of the Number of years of experience in ICUwith the attitude level of the staff nurses and the previous exposure to Continuing Nursing Education on sensory deprivationwith the practice level of the staff nurses working in intensive care units.

Conclusion: The study concluded that interventions like Video Assisted Learning Package regarding sensory deprivation helps to improve knowledge, attitude and practice of the staff nurses. This significantly contributed to improvement in sensory status of the patients, especially those who were admitted into intensive care units.

Keywords: Sensory deprivation; Video assisted learning package; ICU staff nurses.

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Introduction

"Our very hold on reality is basically depend on us, receiving a continual and uninterrupted flow of sensory stimulation from our environment."

A person's senses are vital to survival, growth and development and the experience of bodily pleasure. When social input is lacking, whether from mobility restrictions, communication

problems or confinement from hospitalization–sensory deprivation occurs.

Many of the patients in intensive care units experiences impaired sensory functioning which places them at high risk for injury (both physical and psychological), altered growth and development and decreases their wellbeing.

ICU is a potentially hostile environment to the vulnerable critically ill patients in which the patient experiences psychological and psychosocial stressors in addition to the physical stress.

Sensory stimulation like physical touch, view to nature, adequate ventilation, aesthetic appearance of the ICU, clock and calendar, proper orientation to the patients, music therapy and effective communication by the nurses helps to promote better awakening in critically ill patients and facilitate rehabilitation potential and process. The health care providers especially the nurses have significant role in this scenario.[1–5]

The Statement of the Problem

Effect of Video Assisted Learning Package Regarding Sensory Deprivation on Knowledge, Attitude And Practice of Staff Nurses Working In Intensive Care Units of Selected Hospitals, Thrissur.

Objectives

- Assess the level of sensory deprivation among patients (Group I) in intensive care unit.
- Assess the level of knowledge, attitude and practice of staff nurses working in intensive care unit regarding sensory deprivation.
- Assess the post intervention level of knowledge, attitude and practice of staff nurses working in intensive care unit regarding sensory deprivation.
- Compare the pre intervention level of knowledge, attitude and practice with post intervention level of knowledge, attitude and practice of staff nurses working in intensive care unit regarding sensory deprivation.
- Associate the pre intervention level of knowledge, attitude and practice of staff nurses working in intensive care units regarding sensory deprivation with their selected demographic variables.
- Assess the level of sensory deprivation among patients (Group II) admitted in intensive care units after the interventions to the staff nurses.

Assumptions

- Patients admitted in ICUs may develop sensory deprivation due to lack of sensory stimuli in the environment.
- Video assisted learning package may influence the knowledge, attitude and practice of the staff nurses working in intensive care units and enable them to render a quality nursing care in order to prevent sensory deprivation.

Materials and Methods

Descriptive Statistic

- Frequency and percentage distribution to describe the demographic variables and the level of sensory deprivation in patients admitted in ICUs
- Mean and standard deviation to assess the pre-test and post-test level of knowledge, attitude and practice.

Inferential Statistics

- Paired *t*-test to compare the pre-test and post-test level of knowledge, attitude and practice of staff nurses working in ICUs.
- Chi–square to find out the association with the demographic variables.

Results and Discussion

I. *Comparison of pre intervention level of knowledge, Attitude and practice with post intervention level of knowledge, Attitude and practice of staff nurses working in intensive care units regarding sensory deprivation.*

Table 1 reveals, higher mean score after intervention indicate that there was significant improvement in knowledge after intervention. Result shows that calculated value of *t* (10.111) was

Table 1: Comparison of Knowledge before and after intervention

Attribute	Mean	Std. deviation	t-value	Table value
Pre-test	23.60	8.45	10.111	2.58
Post-test	36.60	5.84		

greater than table value (2.58) and the difference was highly significant at 0.001 level.

Table 2 reveals, higher mean score after intervention indicate that there was significant improvement in attitude after intervention. Result

Table 2: Comparison of attitude before and after intervention

Attribute	Mean	Std. Deviation	*t*-value	Table value
Pre-test	58.66	7.77	11.585	2.58
Post-test	71.98	6.63		

shows that calculated value of *t* (11.585) was greater than table value (2.58) and the difference was highly significant at 0.001 level.

Table 3 reveals, higher mean score after intervention indicate that there was significant improvement in practice after intervention. Result

Table 3: Comparison of practice before and after intervention

Attribute	Mean	Std. Deviation	*t*-value	Table value
Pre-test	15.76	3.30	17.757	2.58
Post-test	23.40	1.58		

shows that calculated value of *t* (17.757) was greater than table value (2.58) and the difference was highly significant at 0.001 level.

II *Assessment of level of sensory deprivation among patients (Group I) admitted in ICU and assessment of level of sensory deprivation among patients (Group II) admitted in intensive care units after the intervention to staff nurses*

Before the intervention to staff nurses; 3 patients (15%) have no sensory deprivation, 8 patients (40%) have mild sensory deprivation and 8 patients (40%) were having moderate level of sensory deprivation and 1 patient (5%) was having severe sensory deprivation.

After the intervention to the staff nurses majority (80%) of the patients admitted in intensive care units had only mild sensory deprivation and 15% of patients had no sensory deprivation and 5% of the patients had moderate sensory deprivation.

It states that Video Assisted Learning Package had enabled the staff nurses to improve their knowledge, attitude and practice in caring patients admitted in intensive care units.

Recommendations

- The study recommends the formulation of Nursing Audit to identify the prevalence of sensory deprivation (alterations) among ICU patients.
- The study recommends equipping intensive care units with all the amenities required, according to international standards.
- A similar study can be replicated in larger scale, including more hospitals and samples, so that generalisations could be done more effectively.

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Knowledge on Use of Technological Devices among Nurses

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Mohammed Azharudheen BS[1], Naveen Kumar K[2], Nivethitha J[3], Padmaja M[4], S Sridevy[5]

Abstract

Introduction: In today's world, technology plays an important role in every industry as well as in our personal lives. Out of all the industries that technology plays crucial role in, health care is definitely one of the most important. In the health care industry the dependence on medical technology cannot be overstated, and as a result of the development of these brilliant innovations, healthcare practitioners can continue to find ways to improve their practice – from better diagnosis, surgical procedures, and improved patient care. *Material and Methods:* The research approach used for this study was quantitative approach and the design selected was descriptive study design. By using convenient sampling technique 33 males nursing officers and 67 female nursing officers were selected for this research. Researcher assessed the level of knowledge among nursing officers using a structured questionnaire tool. *Results:* The study results shows that among 100 samples, 27% samples had adequate knowledge 60% samples had moderate knowledge and 13% samples had inadequate knowledge on use of technological devices. *Conclusion:* The study outcome shows the need for qualitative awareness and education programme about use of various technological devices to improve knowledge and competency, in acheiving better health care.

Keywords: Knowledge; Technology; Technological devices; Nursing officers.

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Introduction

General public believes that technology will improve health care efficiency, quality, safety, and cost. However, few people consider that these same technologies may also introduce errors and adverse events. Given that nearly 5,000 types of medical devices are used by millions of health care providers around the world, device-related problems are inevitable. While technology has the potential to improve care, it is not without risks.

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Patient care technologies of interest to nurses range from relatively simple devices, such as catheters and syringes, to highly complex devices, such as barcode medication administration systems and electronic health records. Technology can be broadly defined to include clinical protocols and other "paper" based tools, but for the purpose of this chapter, we will focus more on equipment and devices that nurses are likely to encounter in delivering direct care to patients. The purpose of this study is to provide a conceptual model for technologies that nurses are likely to encounter and to delineate strategies for promoting their effective and safe use.[1–10]

The primary concept of health is preventive, promotive, and curative with the emphasis of knowledge of nursing officers in Pondicherry.

Materials and Methods

A quantitative research, descriptive study design was undertaken among nursing professionals working in selected hospitals in Puducherry. The

variables explored under study were knowledge on use technological devices among study participants. A total of 100 nurses of both gender; and willing to participate were selected by using simple random sampling technique. Pretested and reliable structured questionnaire was used to gather data. The responses for all items of tool was categorized as correct response (Score 1) and wrong response (Score 0) respectively. The scoring procedure for knowledge was 'adequate, moderate and inadequate. The collected data was coded, tabulated and analyzed as per objectives by using descriptive (mean, SD) and inferential statistics (*t*-test, chi-square test and coefficient of correlation) wherever required, and $p < 0.05$ was considered as statistically significant. As the nurses are working in various multispecialty hospitals with advanced technology, we should assess the knowledge, practice and attitude towards the technological use and its application.

Results

Among 100 samples, 27 samples had adequate knowledge, 60 samples had moderate knowledge and 13 samples had inadequate knowledge. Where 43 samples belong to less than 30 years of age, 51 samples belongs to 31–45 years age and 6 samples belong to 46–60 years of age.

In less than 30 years of age 7 (7%) samples had adequate knowledge, 31 (31%) samples had moderate knowledge and 5 (5%) had inadequate knowledge.

In age group between 31–45, 19 (19%) samples had adequate knowledge, 25 (25%) samples had moderate knowledge and 7 (7%) had inadequate knowledge.

In age group between 46–60, 1 (1%) sample had adequate knowledge, 4 (4%) samples had moderate knowledge and 1 (1%) sample had inadequate knowledge on use of technological devices.

In gender 33 samples were males and 63 samples were females. Among 33 male samples, 2 (2%) had adequate knowledge, 28 (28%) had moderate knowledge and 3 (3%) had inadequate knowledge on use of technological devices. Among 63 female samples, 25 (25%) had adequate knowledge, 29 (29%) samples had moderate knowledge and 13 (13%) samples had inadequate knowledge on use of technological devices.

In educational qualification, 20 samples belongs to GNM, 68 samples belongs to B.sc/PBBSC and 12 samples belongs to M.sc. In GNM, 4 (4%) had adequate knowledge, 11 (11%) had moderate knowledge, 5 (5%) had inadequate knowledge. In B.sc/PBBSC 18 (18%) samples adequate knowledge, 43 (43%) had moderate knowledge, 7 (7%) had inadequate knowledge on use of technological devices.

In year of experience, 27 samples belongs to less than 5 years of experience, 53 samples belongs to 6–10 years of experience. In year of experience less than 5 years of age 6 (6%) samples had adequate knowledge, 18 (18%) had moderate knowledge and 3 (3%) had inadequate knowledge. In year of experience 6–10 years 16 (16%) had adequate knowledge, 27 (27%) had moderate knowledge and 10 (10%) had inadequate knowledge on use of technological devices.

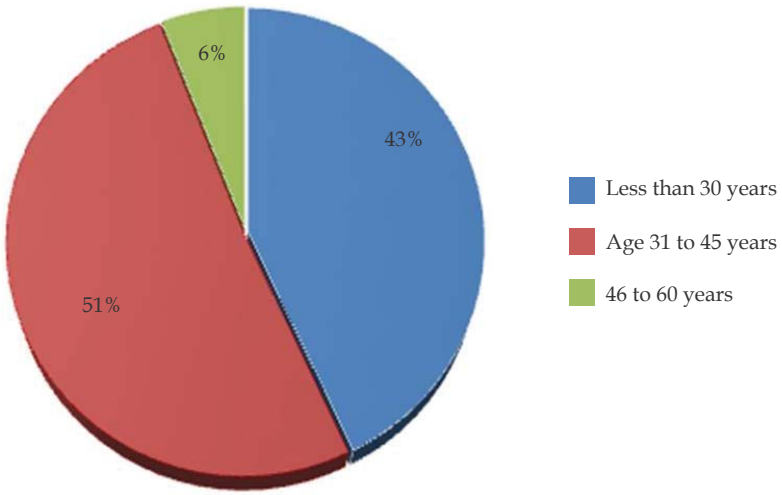

Fig. 1: Frequency distribution of nursing officers by their age.

Table 1: Frequency and percentage distribution of nursing officers by their gender

S. No	Gender	Frequency	Percentage
1	Male	33	33
2	Female	67	67

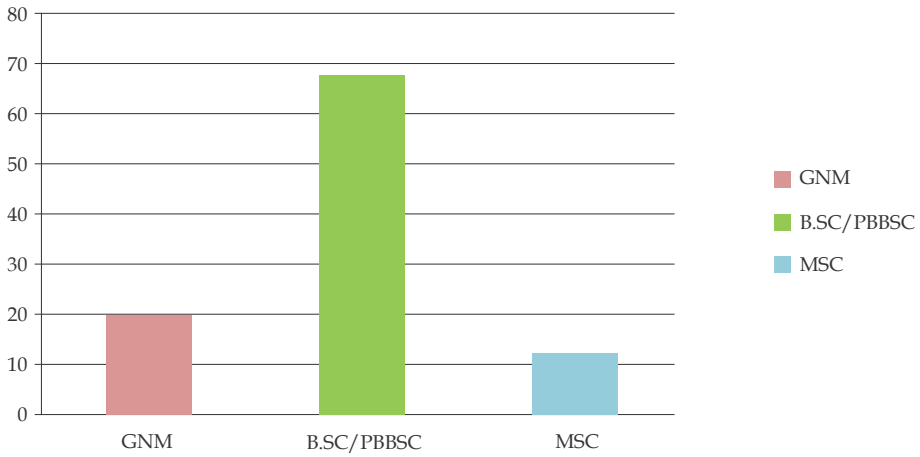

Fig. 2: Frequency distribution of nursing officers by their educational qualification.

Table 2: Frequency and percentage distribution of nursing officers by their year of experience

S. No	Year of experience	Frequency	Percentage
1	Less than 5 years	27	27%
2	6–10 years	53	53%
3	Greater than equal to 11 years	20	20%

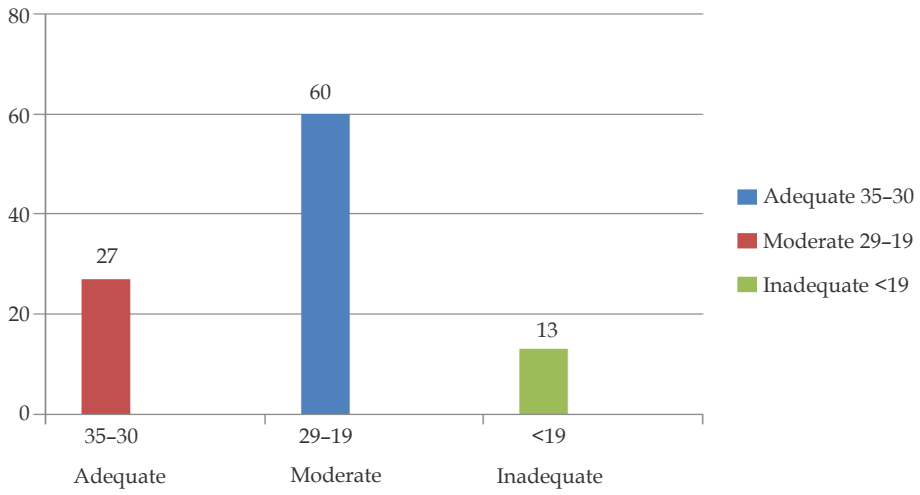

Fig. 3: Knowledge scores on use of technological devices.

Discussion

Among 100 samples, 27 samples had adequate knowledge, 60 samples had moderate knowledge and 13 samples had inadequate knowledge. Where 43 samples belong to less than 30 years of age, 51 samples belongs to 31–45 years age and 6 samples belong to 46–60 years of age.

In less than 30 years of age 7 (7%) samples had adequate knowledge, 31 (31%) samples had moderate knowledge and 5 (5%) had inadequate knowledge.

In age group between 31–45, 19 (19%) samples had adequate knowledge, 25 (25%) samples had moderate knowledge and 7 (7%) had inadequate knowledge.

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Conclusion

The study reveals that out of 100 samples, level of knowledge: 27% had adequate knowledge, 60% had moderate knowledge and 13% had inadequate knowledge respectively.

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Orignal Article

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Effectiveness of Exercise Based Cardiac Rehabilitation on Selected Cardiac Parameters among Postoperated CABG Patient in Selected hospital

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Abstract

Background: As the concept of nursing is changing fast, nursing is not only caring for the sick but takes care for prevention of illness, promotion and maintenance of health. The nurses multiple roles in cardiac rehabilitation have a "spider in the web like" character and depending on the phase of the patients recovery he/she acts as a counsellor, a coach an educator. The study conducted with the aim and objectives of observing the effect of exercise based cardiac rehabilitation on selected cardiac parameters respectively. (1) Heart rate (2) Respiratory rate (3) Blood pressure (4) Saturation of peripheral oxygen (5) Mean arterial pressure (6) Rate pressure product.

Material and Method: A pre-experimental one group-pre-test post-test design study was selected for the study 40 samples were selected by non probability purposive sampling technique, among hospital admitted patient those who full filled the inclusion criteriasuch as postoperated CABG patient who has completed 48 hours after surgery, admitted in selected cardiac unit, with stable regimen, both male and female patients was included. Exclusion criteria were patient with severe critical condition, strict bed rest advised and unconscious patient. Exercise based cardiac rehabilitation activity such as warm up exercise, diaphragmatic breathing exercise, active exercise of extremities, positioning, coughing, huffing, incentive spirometry and ambulation were administered to the patient as per the scheduled duration. Modified observational checklist was used to assess the selected cardiac parameters during pre & post-test. Baseline data was collected from patient records. Validity done and reliability of checklist is 0.98.

Result: Showed that *t*-value of effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters ($t = 3.46$ with df_{19}) were found more than table value 2.09 at 0.05 level significant.

Inference: Hence the exercise based cardiac rehabilitation was found to be effective in terms of cardiac parameters for post CABG Patient.

Conclusion: Hence the study finding revealed that the exercise based cardiac rehabilitation found to be effective and helpful in improving the cardiac functioning and parameter among postoperated CABG patient. Prolong or continuous performance of selected exercises will help the patient to maintain the cardiac health.

Keywords: Postoperated CABG; Exercise based cardiac rehabilitation; Cardiac parameters; Saturation of peripheral oxygen; Mean arterial pressure and Rate pressure product.

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Introduction

Human heart is an organ that pumps blood throughout the body via the circulatory system, supplying oxygen & nutrients to the tissues and removing carbon dioxide and other wastes.[1] Coronary heart disease is epidemic in India and is one of the major causes of disease burden and

deaths, many factors leading to cardiovascular disease can be controlled or modified.[2] Cardiac rehabilitation is becoming an integral part of comprehensive care it can be lifesaving and goal oriented process that enables people with acute or chronic disorders where teaches the cardiac client how to be more active and make lifestyle changes.[3] Cardiac rehabilitation programmes are intended to enhance the effect of acute treatment actions and to prevent risk factors by involving medical evaluation, supervised exercise, education and counselling of patients into the specific recognized phases which helps patients to lead an improvement in their wellbeing and recovery.[4] Coronary artery bypass graft means an operation carried out to bypass a coronary artery narrowed by the atheloma using a graft from a healthy saphenous vein or an internal mammary artery.[5] Thus the findings of study signifies that there is effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters where the cardiac rehabilitation exercise significantly improves functional capacity and some hemodynamic responses such as resting and maximum systolic and diastolic blood pressure, resting and maximum heart rate, ejection fraction and rate pressure product. Exercise based cardiac rehabilitation (ECR) is the activity requiring physical effort which is done especially as supervised or unsupervised inpatient, outpatient or community or home based intervention which is well documented, effective and safe especially to improve health return to more active lifestyle and to prevent or diminish postoperative complications.[6] Physical therapy treatment is often prescribed and the physiological parameters are targeted by the pillars of cardiac rehabilitation which include actionable themes of improvement in exercises such as warm-up exercise, early mobilization range of motion exercise, deep breathing and incentive Spirometry exercises which shows improvement in maintaining blood pressure, heart rate, respiratory rate, oxygen saturation and rate pressure product.[7] It is observed that a very less emphasis is given on rehabilitation of patient with coronary artery bypass graft. On the other hand the incidence of cardiovascular disease related morbidity is increased up to the high. Many services, studies and reviews identified the mortality due to unplanned cardiac rehabilitation of the postoperated coronary artery bypass graft patients. It is revealed that the failure rate of coronary artery bypass graft is associated with lack of awareness and knowledge regarding cardiac rehabilitation. So by considering the seriousness the researcher felt the need to conduct a study on exercise based cardiac rehabilitation to promote awareness and improves cardiac function in patient postoperated with coronary artery bypass graft.

Problem Statement

Effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters among postoperated CABG patient in selected hospital.

Objectives of the Study

1. To assess the effect of exercise based cardiac rehabilitation on selected cardiac parameters of postoperated CABG patients.
2. To find the relationship between pre and post exercise based cardiac rehabilitation on selected cardiac parameters among postoperated CABG patients.
3. To find out the association between post exercise based cardiac rehabilitation on selected cardiac parameters with selected demographic variables.

Hypothesis

(All hypothesis will be tested at 0.05 level of significance).

2. H_0: There will be no significant effect of exercise based cardiac rehabilitation on Selected cardiac parameters of postoperated CABG patients.
3. H_1: There will be significant effect of exercise based cardiac rehabilitation on Selected cardiac parameters of postoperated CABG patients.

Ethical Aspect

To obtain ethical committee approval for conducting research study, permission was taken from institutional ethics committee. Written informed consent was taken from the patient after informing details regarding research study, its benefits and effect of participation in the research study.

Conceptual Frame Work

Conceptual framework for present study is based on Imogene king goal attainment theory. King goal attainment theory has four major concepts of human beings, health, environment and nursing. The major concepts phenomenon are described as perception, judgement, action, interaction, transaction and feedback.

Review of Literature

Review literature is a key step in research process. Review of literature refers to an extensive, exhaustive and systematic examination of publications relevant to research project. An extensive review of related literature enabled the researcher to develop the conceptual frame work, tool, selection of research design and plan for data analysis. Review of literature for the present study is divided under two aspects:

A Literature review related to exercise based cardiac rehabilitation.

B Literature review related to effect of exercise based cardiac rehabilitation on cardiac parameters.

Materials and Methods

Research approach

Researcher selected experimental approach for this research study.

Research design

Research design adopted for the present study is pre-experimental one group pre-post-test study design.

Research study setting

Present study was conducted in cardiac unit of selected hospital.

Population

The study population was postoperated CABG patients in selected hospital.

Sample size

In this study the sample size consisted of 40 patients.

Sampling technique

Non probability purposive sampling technique was used to select the sample.

Method of Selection of Study Subjects/Eligibility Criteria

A Inclusion criteria: Postoperated CABG patient admitted in selected cardiac unit, who has completed 48 hours after surgery, both male and female patients with stable medication regimen will be included.

B Exclusion criteria: Postop CABG patient with severe critical condition such as unconscious patient, intubated patient and strictly bed rest advised patients.

Tool

Tool consists of baseline performa, Modified Observational Checklist for Cardiac Parameters.

Part A: Baseline Performa of postoperated CABG patient such as Age in years, Gender, Religion, Marital status, Educational status, Occupation, Physical activity, Mental activity, Type of family, Type of diet, Diagnosis of CABG, Associated conditions and Ejection fraction value.

Part B: Modified Observational Checklist for Cardiac Parameters to observe, asses and record the effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters such as (Heart rate, Respiratory rate, Blood pressure, Saturation of peripheral oxygen, Mean arterial pressure, Rate pressure product) of postoperated CABG patients. It includes the following aspects:

Part I: Pre-test reading of the selected cardiac parameters is observed during the day first before intervention.(i.e 24 hrs after CABG).

Table 1: Intervention

S. No	Administered Intervention (Exercise based cardiac rehabilitation activity)	Duration	Relaxation time
1.	Warm up	4 min	
2.	Diaphragmatic breathing exercise	5 min	3 min
3.	Active exercise of extremities	4 min	3 min
4.	Positioning	4 min	2 min
5.	Coughing	2 min	1 min
6.	Huffing	3 min	1 min
7.	Incentive Spirometry	5 min	2 min
8.	Ambulation	3 min	3 min

Part II: Administer Intervention schedule till patient is hospitalized.

Part III: Post-test reading of the selected cardiac parameters is observed during the first follow up i.e. (Day 14)

Method of Analysis

The data obtained was analyzed and interpreted by descriptive and inferential statistics based on the objectives of the study.

Results

Section I: Baseline Performa

Analysis of section I revealed that majority of post- operated CABG patient 45% belong to age group of 51–60 years, 65% male gender and hindu religion, 87.5% married group, 32.5% educated upto secondary group, 40% belong to homemaker group, 35% belong to sedentary activity category, 67.5% postoperated CABG patient were from nuclear family,62.5% belong to mix veg, 80% were diagnosed with Tripple vessel disease, 37.5% belong to hypertension group only and 42.5 % belong to 40–54% ejection fraction category.

Section II: Analysis of data related to the effectiveness of cardiac rehabilitation program.

Table 1 and graph 1 revealed the main findings that mean, standard deviation and mean percentage of post-test cardiac parameters is significantly decreased than the pre-test assessment of cardiac parameters.

Table 1: Analysis of data related to the effectiveness of cardiac rehabilitation program

Parameter	Pre-test			Post-test		
	Mean	SD	Mean %	Mean	SD	Mean%
Heart rate	1.12	0.33	9.37	1.00	0.00	8.33
Respiratory rate	1.62	0.48	13.54	1.12	0.33	9.33
Blood pressure	1.37	0.48	11.45	1.12	0.33	9.33
Saturation of oxygen	1.25	0.43	16.41	1.00	0.00	8.33
Mean arterial pressure	1.5	0.5	12.5	1.42	0.49	11.83
Rate pressure product	1.5	0.5	12.5	1.12	0.33	9.33

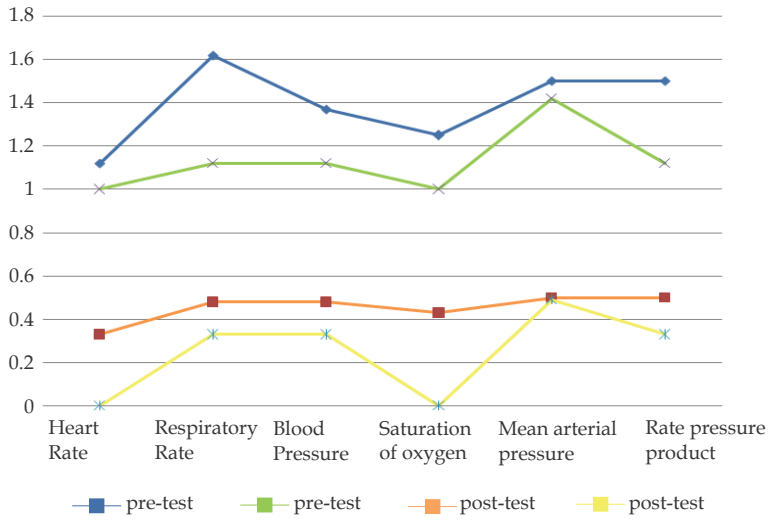

Fig. 1: Effectiveness of cardiac rehabilitation programme.

Section III: Overall level of complications

- In pre-test the majority of subject 22 (55%) belong to mild deviation category, 13 (32.5%) belong to moderate deviation, 3 (7.5%) no deviation and 2 (5%) belong to severe 11 and above category.
- In post–test the majority of subject 20 (50%) belong to mild deviation category, 18 (45%) belong to no deviation, 2 (5%) moderate deviation and 0% belong to severe deviation category.

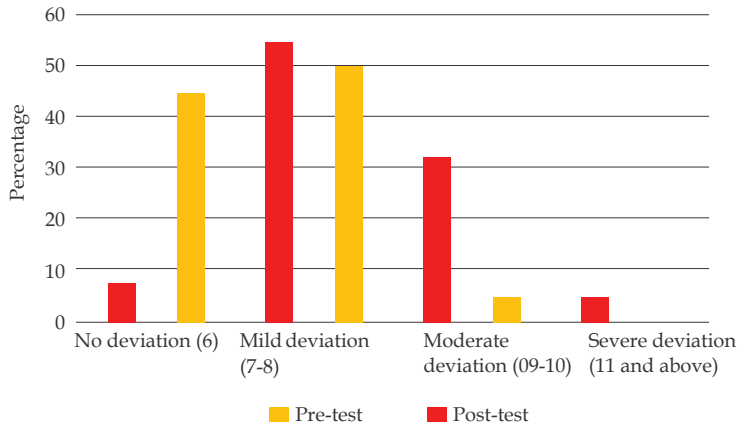

Fig. 2: Overall level of complications.

Section IV: Analysis of data to find relationship between mean score pre and post exercise based cardiac rehabilitation

The pre-test total mean percentage reading of cardiac parameters was 69.66% with a mean ± SD of 8.36 ± 2.72 and post-test reading of cardiac parameters is decreased by mean percentage 56.5% with a mean ± SD of 6.78 ± 1.48 after the intervention programme (Exercise based cardiac rehabilitation activity). The *t*-value of effectiveness of exercise based cardiac rehabilitation on selected cardiac parameters *t* (8.62) were found more than the table value (1.68), with the degree of freedom 39.

Section IV: Association of selected cardiac parameters with selected demographic variables

Chi-square values were calculated to find the association of cardiac parameters with their selected baseline performa. The study findings reveals that there was significant association of cardiac parameters with their baseline performa like physical activity (χ^2 =4.71), Diagnosis of CABG (χ^2 = 4.27), associated condition (χ^2 = 6.50) and ejection fraction (χ^2 = 11.90) which is highly significant.

Implications of the Study

The present study findings have implications for nursing practice, nursing educations, nursing administrations, and nursing research.

Nursing Practice

- Nursing profession has been developing faster in recent years in a unique way. The major change that has occurred in the profession is expansion in the role of nurses. Cardiac rehabilitation nurse plays an integral role in caring for and assisting patients who are recovering from and managing their cardiovascular problems.
- Findings of the present study would help nurses and other healthcare personnel to know the need of exercise based cardiac rehabilitation activity for the postoperated coronary artery bypass graft patient. It is one of the most effective interventions.

Nursing Education

- As a nurse educator there are abundant opportunities for nursing professionals to educate/teach students in their curriculum about the cardiac rehabilitation program specifically about exercises importance and effectiveness for decreasing the level of complications and improving the cardiac functioning and parameter among postoperated cardiac patients
- More encouragement should be given in conducting the induction training, workshop, seminars for the staff nurses and education for family members regarding the identification of health problems and taking necessary steps to resolve them by organizing health education programme for better practice.

Nursing Administration

- Nurse personnel should be prepared to take leadership role in training the staff, educating students, guide, advice support and assist the patient in adapting an altered lifestyle related to cardiac rehabilitation activities and its effect on cardiac parameters.
- The administrator has to arrange training

programs, in service education or continuing education classes in such a way that each staff gets exposure of the training program and can introduce the safe practices and physical activity recommended for cardiac patients after surgery to maintain the cardiac functioning.

Nursing Research

- Findings of the study will motivate the researchers to conduct same study with different variables on a large scale.
- Evidence based practice with different treatment modalities for stabilizing cardiac parameters of postoperated CABG Patients can add the knowledge area in the field of research.

Limitations

- The study was limited only for CABG patients.
- Only selected exercises were assessed in cardiac rehabilitation activity.
- Small number of subjects limits generalization of the study.
- Study has been maintained only for 14 days.

Recommendations

- A similar study can be conducted on large scale by adding more sample size to draw more definite conclusion and make generalization.
- Alike studies can be undertaken with a control group.
- Cardiac surgeries other than CABG can be included.
- Exercises and alternative treatment modalities can be done for more specific result.
- Cardiac rehabilitation programme can be started immediately during the time the client is diagnosed with CABG.

Conclusion

"Every heart that beats strongly and cheerfully has left a hopeful impulse behind it in the world and bettered the tradition of mankind"

Hence the exercise based cardiac rehabilitation found to be effective and helpful in improving the cardiac functioning and parameters among post-operated CABG patients.

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Orignal Article

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Patient Satisfaction with Operation Theatre Services in a Tertiary Care Hospital in South India: A Cross-Sectional Study

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Abstract

Monitoring of patient satisfaction is routinely done in almost all health care settings as a measure of monitoring quality in delivery of health services. Perioperative patient satisfaction aids in postoperative recovery reduce the need of pain medication and augment patient-health provider relationship. Present study aimed at assessing level of satisfaction in patients towards operation theatre in a tertiary care hospital. *Methods:* Data was collected from 200 subjects who attended the operation theatres of ESIC Medical College Hospital, Kerala. Samples were selected conveniently. Data collection was done using structured questionnaire. Analysis was done employing descriptive and inferential statistics. $p < 0.05$ was considered as statistically significant. *Results:* Among the study subjects, 56% subjects were highly satisfied with operation theatre services. Significant association was revealed between level of satisfaction and educational status ($p < 0.05$). *Conclusion:* More than half (56%) of the subjects were satisfied with operation theatre services. A high level of satisfaction was found with the operation theatre staff behavior.

Keywords: Patient satisfaction; Operation theatre services; Tertiary care hospital.

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Introduction

Quality in delivery of health care is indispensable, since it deals with human life. It modulates the occurrence of desired health outcome with present information.[1] Level of satisfaction towards available health care services is a vital indicator of quality of care, which contributes to evaluation of structure, process and outcome of services.[2] Components like availability of services, institutional structure, mutual relationships, knowledge and skill of health care professionals and patient's own desires and inclinations add to patient satisfaction.

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Numerous studies throws light to the fact that hospital work culture (good nurse to patient ratio, encouraging nurses in decision making and healthy physician–nurse relations) are attributed to good health outcome and improving patient satisfaction. This is in fact related to the significant role of nurses in overall operation of hospitals.[3]

Evaluating patients their opinion of consideration and treatment they have received is a vital process focusing on enhancing the quality of care, to monitor whether hospitals are addressing patients' needs and distinguish potential obstruction for the delivery of health care services.[4] Numerous factors can affect the patient satisfaction with operation theatre services which is really unpredictable. Based on patients' expectation and perceived level of satisfaction with the provided care, patients may choose alternate health care agencies.[5]

It is of utmost importance that a strategy should be established to deliver equitable, easily available and satisfactory treatment to all patients. Patient satisfaction is of great value and is helpful in identifying need of health care seekers. Health care services will be relevant and acceptable if it

is identifying and meeting the satisfaction level of patients. Literature review of similar articles also suggest the basic satisfaction level assessment is a tool to determine the extent of health care delivery, observing the present situation and deliver a strategy to improve.[6]

Objectives

- To assess the level of satisfaction of patients towards operation theatre services.

Materials and Methods

Research design

A cross-sectional research design was employed in the present study to determine patient satisfaction towards the operation theatre services. The main purpose of this study was to assess the level of satisfaction in patients after anesthesia and surgery and to identify the factors influencing level of satisfaction/dissatisfaction in patients.

Study area

Employee's State Insurance Corporation Medical College Hospital, Parippally, Kerala was selected as the study health facility. The study population was derived from the patients attending the operation theatres of ESIC Medical College Hospital, available at the time of data collection.

Reference population

Patients who attended the operation theatres of ESIC Medical College Hospital were the reference population.

Source population

Patients who attended the operation theatres of ESIC Medical College Hospital, Parippally and underwent surgery under spinal/epidural or general anesthesia.

Inclusion criteria

- Patients aged above 15 years.
- Patients who were able to read and write.
- Patients underwent surgery under spinal/ epidural or general anesthesia.

Exclusion Criteria

- Patients who were not willing to participate
- Patients who were mentally challenged

Study sample

Subjects who fulfilled the inclusion criteria were selected conveniently by the investigator.

Sampling technique and sample size

The sample was drawn conveniently from the source population. The sample size calculated was 177 by considering 0.867 proportion of patients satisfied with health services.[7] For improving the precision, data was collected from 200 subjects.

Tool for data collection

The research tool was a structured, self administered questionnaire which was designed by the investigator under the guidance of experts. The questionnaire was translated to Malayalam language which is locally used in the place of study. Validity and reliability of the data collection tool was checked and found satisfactory.

Data collection procedure

- The data collection was done during the months of December 2013 – March 2014.
- Data collection was done in the postoperative surgical wards of ESIC Medical College Hospital Parippally.
- Permission for the study was sought from the respective Head of the Departments and concerned sister in charge was informed regarding the study.
- A survey was conducted in the respective wards for selecting the subjects according to inclusion criteria.
- Written informed consent was obtained from the study subjects.
- Data collection was done using a structured questionnaire developed by investigator after extensive literature review and validated by experts.
- Data was collected from the subject itself.
- Data collection was done by the investigator himself.

Ethical considerations

- Permission was obtained from the competent authority.
- An informed written consent was obtained from each patient involved in the study.
- All the study subjects were informed about their participation in the study, objectives of study and duration of their involvement.

- All the study subjects were given full autonomy to withdraw from the study at any time.
- Anonymity and confidentiality of the subjects were maintained while collecting the data.
- Treatment of the patient did not withhold or altered in any way to facilitate their intake into the study.

Data analysis

- The retrieved proforma has been put to detailed and scrupulous analysis after entering the raw data into the coding sheets.
- The data was analyzed using both descriptive and inferential statistics.
- Calculation was carried out manually, using a calculator and with the help of Microsoft Excel (2007) and Statistical Package for Social Sciences (SPSS version 16.0 Inc., Chicago, IL).
- Patient's demographic data were estimated as number and percentages for categorical data and means with standard deviation for interval data.
- The analyzed data was presented in the form of tables, graphs and other figures.
- The level of statistical significance was kept at $p < 0.05$.
- Interpretation of the findings was done.

Results

This cross-sectional study was conducted to ascertain the patient satisfaction regarding operation theatre services at ESIC Medical College Hospital, Parippally, Kerala. Total 200 subjects were provided with questionnaire which was in their local language.

Socio demographic and related characteristics of the subjects

A total of 200 subjects were included for the study. One hundred and four subjects (52%) were males. The mean age of the subjects was 42.60 ± 12.78 years. Male respondents constituted largest group (n = 134, 67%). One hundred and thirty nine subjects out of 200 subjects (69%) were married. Majority of the subjects (86%) were educated up to secondary level. Seventy eight percent of the subjects were employed in private firm. Majority of the subjects (n = 156, 78%) were employed in private firm.

Out of two hundred subjects, 32 (16%) were taken for surgery on emergency basis; whereas the remaining 168 (84%) were taken up for planned surgery. Sixty six (33%) subjects underwent surgery under general anesthesia, forty eight cases (24%) were performed under spinal anesthesia, fifty four (27%) under regional anesthesia and thirty two (16%) under epidural anesthesia.

Accessibility of subjects to health care services

Accessibility of the subjects towards operation theatre services was measured based on two components viz; waiting time and information received.

The mean number of days patients had to wait for surgery after completing all investigations and preoperative checkups was 8.13 ± 3.70 days; which ranges from day 0 to a maximum of 18 days. Majority of the subjects (76%) wait less than 10 days for surgery after completing all preliminary investigations and checkups (Fig. 1) N = 200.

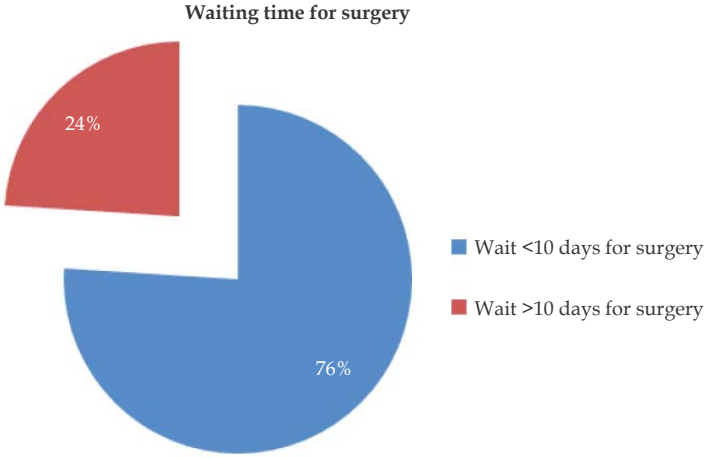

Fig. 1: Average number of days the subjects had to wait for surgery after completing all investigations and preoperative checkups.

The time period that the subjects had to wait for attending by a health care professional in preoperative room was also studied in the Fig. 2. Mean time that the subjects had to wait in preoperative room for attending by a health care professional was 10.60 ± 4.04 minutes; with a range of 1-15 minutes. It was noticed that more than half of the subjects (59%) were attended by health care professional within 10 minutes (Fig. 2) *N* = 200.

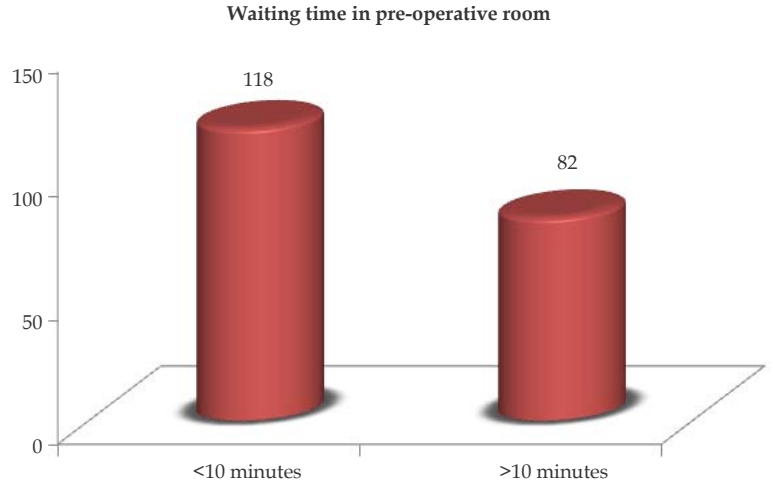

Fig. 2: Mean duration of time (in minutes) that the subjects had to wait in the preoperative room to be attended by a health care professional.

Patient satisfaction towards operation theatre services and postoperative management in wards

To assess level of patient satisfaction; operation theatre services and postoperative management in wards were taken as indicators. The level of patient satisfaction was measured by a Likert's scale having five grades as 5 = very satisfied, 4 = satisfied, 3 = neutral, 2 = dissatisfied and 1 = very dissatisfied. The mean score of total satisfaction was 53.17. The score equal and more than mean was considered as high satisfaction and the score less than mean was considered as low satisfaction level. Table 1 depicts the patient response towards operation theatre services and postoperative management in wards.

Table 1: Patients response to the questionnaire *N* = 200

Variables	Level of satisfaction				
	5	**4**	**3**	**2**	**1**
Operation theatre services					
Did the operation theatre staff understand your situation?	88	92	18	2	0
Politeness of the operation theatre staffs for you?	95	87	4	14	0
The professionalism of the operation theatre staffs?	58	76	0	66	0
The attention of the operation theatre staff to your questions?	102	43	0	55	0
Did the operation theatre staff give attention to your complaint like pain or nausea?	116	78	6	0	0
Did the operation theatre staff treat you kindly?	112	72	16	0	0
Were you confident that the operation theatre staffs were knowledgeable and skilful?	64	72	64	0	0
Postoperative management in wards					
Nurses' provide prompt response for your call?	74	112	0	14	0
Adequacy of ward nurses' information to you about your health progress?	92	86	22	0	0
Adequacy of information provided by ward nurses about the side effects of medications?	61	78	29	32	0
Adequacy of time the ward nurses spent with you during evaluation and treatment?	58	76	38	28	0
Responsibility of the physician for you?	81	76	14	10	19
The communication of the physicians with you in an understandable way?	82	46	16	44	12

5 = Very satisfied, 4 = Satisfied, 3 = Neutral, 2 = Dissatisfied, 1 = Very dissatisfied

Item wise mean and SD for patient satisfaction with operation theatre services

As shown in Table 2, satisfaction questions were computed individually to derive mean of each item. It was found out that six of them had mean score more than four.

This shows that patients had relatively higher satisfaction level in most of the parameters. Maximum of the study subjects acknowledged the kind treatment by operation theatre staff (mean 4.48). The lowest mean was 3.63, which indicates professionalism of theatre staff needs to be improved.

Table 2: Item wise means and SD for patient satisfaction with operation theatre services

Variables	*N* = 200	
	Mean	**SD**
Operation theatre services		
Did the operation theatre staff understand your situation?	4.33	0.61
Politeness of the operation theatre staffs for you?	4.32	0.74
The professionalism of the operation theatre staffs?	3.63	1.22
The attention of the operation theatre staff to your questions?	3.96	1.15
Did the operation theatre staff give attention to your complaint like pain or nausea?	4.47	0.57
Did the operation theatre staff treat you kindly?	4.48	0.44
Were you confident that the operation theatre staffs were knowledgeable and skilful?	3.68	1.26
Postoperative management in wards		
Nurses' provide prompt response for your call?	4.23	0.52
Adequacy of ward nurses' information to you about your health progress?	4.35	0.67
Adequacy of information provided by ward nurses about the side effects of medications?	3.84	1.02
Adequacy of time the ward nurses spent with you during evaluation and treatment?	3.82	1.01
Responsibility of the physician for you?	3.95	1.12
The communication of the physicians with you in an understandable way?	3.71	1.36

Level of total satisfaction with operation theatre services

Total satisfaction; as given in Table 3, was computed by categorising it into high satisfied and low satisfied groups. The respondents secured a score of mean or more were considered as highly satisfied while those secured less than the mean score were taken as low satisfied. According to the output shown in Table 3, more than half of subjects (n = 112, 56%) were highly satisfied. The finding is inconsistent with the study reports of Gebremedhn and Lemma[8] and Jlala et al.[7] which concluded that their satisfaction rate was above 86%. This variation may be due to difference in quality of service provided or difference in expectations of the patients.

Table 3: Level of total satisfaction with operation theatre services *N* = 200

Satisfaction	Frequency	Percentage
High level of satisfaction (mean and above)	112	56
Low level of satisfaction (less than mean)	88	44
Total satisfaction: Mean = 53.17, SD = 4.12		

Association between satisfaction and demographic variables

As outlined in the Table 4, the association between selected socio demographic variables with satisfaction was assessed. No significant association was found out between age, gender, marital status and occupation with level of satisfaction, where as a significant association was obtained between level of satisfaction with educational qualification ($p < 0.05$).

Table 4: Socio demographic factors and patient satisfaction with Operation Theatre services *N* = 200

Variables	Satisfaction level					Chi-square	*p*-value
	Low satisfaction		High satisfaction				
	Frequency	percentage	Frequency	percentage			
Age						0.63	0.96
16–25 years	32	14	64	18	36		
26–35 years	32	12	52	20	48		
36–45 years	30	12	55	18	45		
46–55 years	66	28	50	38	50		
>56 years	40	22	55	18	45		
Gender						0.60	0.44
Males	124	56	57	68	43		
Females	76	32	48	44	52		
Marital status						1.34	0.51
Single	50	22	64	28	36		
Married	138	60	51	78	49		
Widow/er	12	6	50	6	50		
Educational status						10.42	0.005*
Primary	59	30	63	29	37		
Secondary	108	54	59	54	41		
Higher education	33	4	14	29	86		
Occupation						2.28	0.13
Not employed	44	20	68	24	32		
Private	156	68	50	88	50		

Discussion

Waiting time for surgery after completing all investigations was less than 10 days in majority (76%) of subjects. This signifies that case wise importance was given to each patient on timing of patient taken up for surgery. It also contributed towards better satisfaction of patients. Study also revealed that, more than half of the subjects were satisfied with operation theatre services. This finding is in congruent with study finding by Gebreedhn et al.[8] which concluded that majority of the subjects were satisfied with operation theatre service.

Conclusion

1. More than half (56%) of the subjects were satisfied with operation theatre services.
2. A high level of satisfaction was found with the operation theatre staff behavior.
3. Socio demographic variables except educational qualification did not prove any association with level of satisfaction. This may be due to the fact that educated people will rationalize the care and facilities available.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

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Corporate (collective) author

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[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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