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Study on the Effect of Pre-Operative Patient Education on Post-Operative Outcomes

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Abstract**—**Patient satisfaction represents a crucial aspect in the evaluation of health care services. Preoperative teaching provides the patient with pertinent information concerning the surgical process and the intended surgical procedure as well as anticipated patient behavior (anxiety, fear), expected sensation, and the probable outcomes. Although patient education is part of Accreditation protocols, it is not uniform at most places. The aim of this study was to try to assess the benefit of preoperative patient education on selected post-operative outcome parameters; mainly, post-operative pain scores, requirement of additional analgesia, return to activity of daily living and overall patient satisfaction, and try to standardize few education protocols. Dependent variables were measured before and after the treatment on a study population of 302 volunteers. Educational intervention was provided by the Investigator in the pre-operative period to the study group through personal counseling. An information booklet contained detailed information was also provided. Statistical Analysis was done using Chi square test, Mann Whitney u test and Fischer Exact Test on a total of 302 subjects. P value <0.05 was considered as level of statistical significance and p<0.01 was considered as highly significant. This study suggested that patients who are given a structured, individualized and elaborate preoperative education and counseling have a better ability to cope up with postoperative pain in the immediate post-operative period. However, there was not much difference when the patients have had almost complete recovery. There was no difference in the requirement of additional analgesia among the two groups. There is a positive effect of preoperative counseling on expected return to the activities of daily living and normal work schedule. However, no effect was observed on the activities in the immediate post-operative period. There is no difference in the overall satisfaction score among the two groups of patients. Thus this study concludes that there is a positive benefit as suggested by the results for pre-operative patient education. Although the difference in various parameters studied might not be significant over a long term basis, they definitely point towards the benefits of preoperative patient education.

Keywords**—**Patient education, post-operative pain, patient satisfaction, post-operative outcome.

I. Introduction

PREOPERATIVE anxiety, impaired functional status and post operative pain control are important in the management of surgical patient and related to successful recovery and patient satisfaction. Fear of the unknown is expected when the patient is admitted for surgical procedure and the patient may feel vulnerable.

Evidence shows that patients suffer needlessly due to inadequate preoperative preparation and lack of information regarding the postoperative course as indicated by reports of unexpected pain, fatigue and inability to care for oneself [1].

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Preoperative teaching provides the patient with pertinent information concerning the surgical process and the intended surgical procedure as well as anticipated patient behavior (anxiety, fear), expected sensation, and the probable outcomes [2].

Preoperative teaching also offers reassurance to the patient via therapeutic communication. The health team seeks a response from the patient that is favorable to the patient's mental and physical health. Relevant information, skills training, and psychological support are essential components of the educational intervention or the pre-operative patient education [3]. Kernaghan et al. demonstrated that patients who received structured preoperative education, compared to patients who do not, have improved outcomes. These outcomes included (a) less patient anxiety, (b) reduced postoperative complications such as atelactasis, pneumonitis and fever, (c) decreased need for analgesics, and (d) more rapid recovery as indicated by earlier discharge and return to work and normal daily activities [4].

Surgical patients who require hospitalization postoperatively are admitted on the day of surgery whenever possible. The impact of this change is that preoperative teaching time in the hospital is no longer available [5]-[7]. Another impediment to preoperative education is cost. Divine and Cook (1986) estimated that each patient requires one hour of time for a successful educational intervention. The allocation of hospital resources, including nursing personnel, materials, and space for the intervention requires payment for the educational service to the budget [8].

Instituting a patient preoperative education program which includes information, skills training and psychosocial support is challenging. Improved patient outcomes would document the benefits of a preadmission preoperative education program.

II. Conceptual Framework

The conceptual framework proposes relationships between the independent variable, pre-admission preoperative psycho-educational intervention, and the dependent variables of acute pre-discharge morbidity and post discharge recovery (return to normal). Assumptions for the framework include

(a) Impending surgery creates a learning need and a need for psychological support,
(b) Patients seek knowledge and psychological support from health care professionals who have specialized knowledge,
(c) Demographic variables and health status affect the patients' response to impending surgery,

(d) Recovery can be measured by physiologic variables in the pre-discharge phase,
(e) Recovery can be measured by return to normal social and role function in the post discharge phase, and
(f) People desire optimal recovery. Most patients enter the health care setting with a knowledge and experience deficit about the impending event.

The intervention should be conducted one to two weeks before the day of surgery when the patient is scheduled for preadmission testing. It is based on assessment of needs, including learning needs. The patient (and family) will learn about the peri-operative routines and sensations in the holding area, operating room, post anesthesia care unit, and the nursing care unit. The patient will learn skills and exercises which can improve recovery. The patient will receive psychological support by addressing concerns and fears about impending surgery with the nurse. Results of the Intervention will be improved pre-discharge and post-discharge recovery [9]-[11].

The most common form of pre-operative education is in the form of information pamphlets which is given to the patient before surgery, to prepare themselves for the upcoming procedure. [12] Other forms include videos, structured instructions which may include specific agenda to be taught to the patient within a given time frame with demonstration and Website programs that explain procedure or specific information about surgery.

Instituting a patient preoperative education program which includes information, skills training and psychosocial support is challenging. As more and more elective surgeries are planned as day care or short stay procedures, this concept of patient education attains a paramount importance.

III. Purpose of Study

There have been no published studies on this issue from India. Although patient education is part of accreditation protocols, it is not uniform. Most of the existing literature is from non-general surgical practice & mainly from nursing perspectives. The present study assessed the benefit of preoperative patient education on selected post-operative outcome parameters and tried to standardize few education protocols.

IV. Aims and Objectives

The present study was carried out with the aims and objectives of studying the effect of preoperative patient education on post operative patient outcome in terms of:

1. Pain Scores
2. Return to daily activity
3. Additional analgesia requirement.
4. Overall patient satisfaction.

V. Method and Materials

A. Methods

This includes the research design, setting of the study, descriptions of the population, sampling procedures, data collection, descriptions of instrumentation, limitations and plan for data analysis.

B. Setting of the Study

This prospective randomized case control study was conducted in the department of Minimal Access and General Surgery at Fortis Escorts Hospital and Research Centre, Faridabad, India. After necessary approvals from the Hospital Scientific Committee and from an independent Hospital Ethics Committee, the study was started. The study was over a period of 18 months from September 2012 to March 2014.

The intervention took place in the pre-operative ward at the hospital. Post-operative data was collected in the inpatient surgical unit in the same hospital. The educational intervention was a pre-operative education, rather than a pre-admission education.

The two week post-operative data was collected during the scheduled second follow up visit of the patient, and whom it was missed out, it was collected by a telephonic call.

C. Research Design

A preospective case control study was undertaken. Dependent variables were measured before and after the treatment. The treatment was a planned educational intervention provided by the Investigator. The subjects were randomly assigned into test and control groups using random number table. Patients were invited to consent to participate in the study, allocated a study number and randomly assigned (using randomized number tables) to the standard pre-admission program (Control Group - SP) or standard program plus education intervention (Study Group- EI).

D. Description of the Population

Patients presenting to the out-patient department and the emergency department of Fortis Escorts Hospital and Research Centre without an emergent need for surgery and who fulfilled the eligibility criteria and gave their free voluntary consent to be a part of the study comprised the population of the study.

E. Inclusion Criteria

All patients presenting to the surgical department with a diagnosis of Gall stone disease, Hernia or with anorectal diseases including hemorrhoids, fissures and fistula were considered for inclusion. This included those between 15 yrs of age and 85 yrs of age who are able to comprehend the procedure and with the ability to understand the nature of the procedure.

F. Exclusion Criteria

The following patients were excluded from the study:

a. Patients undergoing emergency surgeries for any of the above mentioned disease as they would not be able to receive any pre-operative education.
b. Patients having any deviation from the standard procedure due to any intra operative findings, as they might alter the recovery.

c. Patients necessitating prolonged hospital stay due to any reason, as this might introduce bias into the study.
d. Any other surgery/additional surgery as it would affect the study parameters.

G.Sampling Procedures

Before starting the study, help of a bio-statistician was taken who validated the study design, confirmed the sample size so that it would reach statistical validation, and approved the method of randomization.

First one hundred patients opting for surgeries for any of the three conditions each (gall stone disease, hernia and ano-rectal disease), and those who met the inclusion criteria and consented to participate were included in the study. The treatment consisted of assessment and a counseling session. The entire interaction took approximately 20-30 minutes. The control group session took approximately 10 minutes. Identification of an individual's learning needs is a critical portion of the assessment. The assessment was routinely done by the doctor on duty in the control group, while in the study group, the detailed assessment and counseling was done by a single person. Of particular importance for this study was the assessment of a patient's learning needs and readiness to learn.

A copy of the completed assessment form was kept in each patient's study file. Names were deleted from the forms and identification numbers were used. A pamphlet of routine preoperative information was used as a teaching material to supplement the instruction for subjects. In the study group preoperative information was reviewed verbally using discussion and question/answer methods to ensure patient comprehension and clarify misconceptions.

A preoperative teaching booklet, "Information About Your Admission-Day Surgery", containing core information was given to both control and experimental groups. The subjects in the experimental group received a complete assessment, routine information about hospital admission, physical preparation for surgery and detailed information given by the investigator about the entire surgical experience. The subjects in the control group had a 10 minute session which consisted of assessment and routine information about hospital admission and physical preparation for surgery. The booklet was given to the patients for review by the patient at a later time in the study group.

Study group subjects also received training on the incentive spirometer which was issued during this preadmission preparation. This allowed subjects to practice and prepare postoperative exercises during the preoperative phase. Additional training was provided to help patients develop skills in activities of coughing, deep breathing, leg exercises, turning in bed, getting out of bed, and ambulation. Return demonstration and practice was used to teach and evaluate learning of this material.

Documentation of the teaching for both groups was done. Support to the patient and/or family was provided by the investigator and/or clinic/hospital staff responsible for the safety and well-being of the patient. They were also given a contact number to be called up in case of need which was available 24 hours.

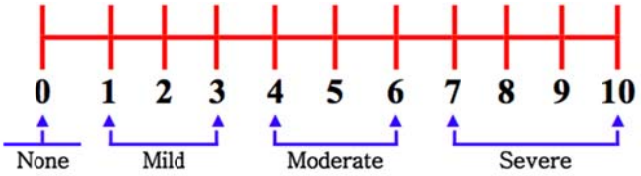

Fig. 1 Numeric Pain Scale: 0 = No Pain; 1-3 = Mild Pain (nagging, annoying, interfering little with ADLs); 4–6 = Moderate Pain (interferes significantly with ADLs); 7-10 = Severe Pain (disabling; unable to perform ADLs); Post-Operative pain assessment was done on Day 1, Day 6-8 and Day 12-15 of surgery using the scales mentioned above

H.Standard Post-Operative Analgesia

The protocol followed for Post-operative analgesia was in accordance with the WHO Step ladder for post-operative pain relief.

1. Inj Dilcofenac
2. Inj Paracetamol: Given on post operative day 0.
3. Inj Pentazocine + Inj Promethazine: Given on the night of surgery.
4. In case of contraindication to diclofenac, Tramadol was given.
5. Patient was discharged on Diclofenac and Paracetamol or Tramadol and Paracetamol.

It has been demonstrated that patients exposed to multimodality pain therapy experience less post operative complications and a reduced duration of hospital stay, indicating that a combination of modalities will result in less post operative pain and better clinical outcome.

I. Additional Analgesia Requirement

The need of additional analgesia requirement over the prescribed analgesics at the time of discharge was recorded. Ketorolac was given as and when required medicine when the standard analgesics failed to make the patient pain free. Any additional analgesic requirement was also captured.

J. Return to Activity

The patients were enquired about the activities performed on Day 1, Day 6-8 and Day 12-15 of surgery. These included

a. Independently going to washroom.
b. Sitting on dining table for meals
c. Doing Activities of daily living (ADL) and
d. Return to normal work schedule.

The return to activities of daily living was taken on the basis of standard hospital protocol. The patients were observed during the 1st postoperative day while data for rest two occasions i.e. on 1st Out Patient visit usually 6th day and on day 12th to 15th was taken as reported by the patient.

K.Overall Patient Satisfaction Score

The standard patient satisfaction toolkit was used by our Patient Welfare Department for both groups which is a part of the general satisfaction assessment protocol of the hospital. This was filled in the end by the patient welfare officers to

remove any bias and introduce a sort of blinding. This further improved the validity of the test. This scoring system has been developed by the Fortis Healthcare Group and is being widely used in all 67 group hospitals.

VI. Data Analysis Plan

All the data was collected in the study performa, collated into a master chart in Excel format. This was then forwarded to the biostatistician for analysis.

Analysis of variance for an independent measures design was used for statistical analysis of the parametric between groups' ratio level data. Statistical Analysis was done using Chi square test, Mann Whitney u test and Fischer Exact Test. P value <0.05 was considered as level of statistical significance and p<0.01 was considered highly significant.

The data was analyzed by using SPSS statistical version software latest version.

Name of Procedures	Educational Intervention/Study group	Standard Education group/Control group
Lap cholecystectomy	50	52
Hernia Surgery	51	49
Anorectal Surgery	51	49
Total	152	150

Fig. 2 Distribution of patients in each group

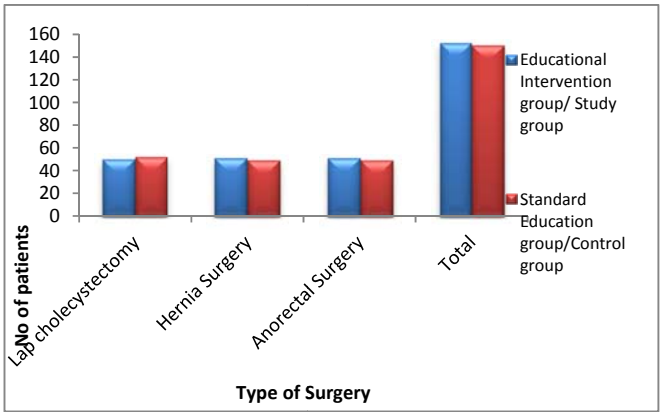

Fig. 3 Patient distribution

Summary statistics table				
	Group			
	Case		Control	
	Mean	SD	Mean	SD
AGE	47.645	15.1038	47.887	15.0429

Fig. 4 Mean age of study and control group patient

VII. Data Analysis and Interpretation

This study was conducted at Fortis Escorts Hospital and Research Centre, Faridabad from September 2012 to March 2014.

Both the standard education and the educational intervention group had 4 attending surgeons each with minimum 8 years of experience in the department of general surgery post specialization. All patients received care from a team of residents under the able guidance and direction of the attending consultant surgeon.

A. Sample Description

The randomized sample consisted of 150 patients in control (Standard education) group and 152 patients in the study (Educational Intervention) group. Out of those who received standard education 52 patients underwent laparoscopic cholecystectomy, 49 underwent hernioplasty and another 49 underwent anorectal surgery. The patients who were in the educational intervention group included 50 patients who underwent laparoscopic cholecystectomy, 51 underwent hernioplasty and 51 who underwent anorectal surgery. The groups were adequately matched for distribution of surgeries.

B. Demographics

1) Age

The mean age in the standard education (control group) was 47.887 years (Standard deviation- 15.0429) while the mean age in the educational intervention (study group) was 47.645 years (Standard deviation- 15.1038). Mann Whitney test of statistical significance showed that there was no statistical difference in age between the two groups (p- 0.75) and both the groups were adequately matched.

C. Analysis of Pain Score

1) Using Numeric Pain Score on POD 1

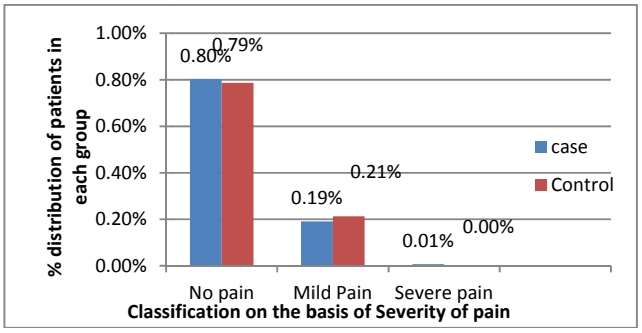

Fig. 5 Distribution of patients on the basis of Numeric Pain Score on Day 1

When the pain score was assessed using the numeric pain score on postoperative day 1, it was found that out of 150 control (standard education) group patients 61 (40.67%) patients had severe pain, 88 (58.67%) had moderate pain, 1 (0.67%) had mild pain and none (0.00%) of them had no pain. Amongst the study (educational intervention) group 73 (48.03%), 65 (42.76%) had moderate pain, 13 (8.55%) had mild pain and 1 (0.66%) had no pain.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.805[a]	3	.001
Likelihood Ratio	18.123	3	.000
No. of Valid Cases	302		

Fig. 6 P value for Numeric Pain Score on Day 1

The p value using the Pearson Chi-Square test for qualitative data was calculated to be 0.001 when the data was based on the *0-10 NUMERIC PAIN RATING SCALE* (<0.05) showing that there is a significant difference in the pain score between the two groups.

2) Using Numeric Pain Score on POD 6-8

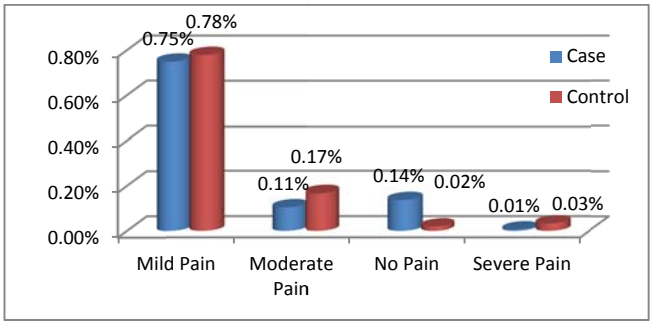

Fig. 7 Distribution of patients using Numeric Pain Score on day 6-8

When the pain scores were analysed using the numeric pain score on postoperative day 6-8, it was found that in the control (standard education) group 117 (78.00%) had mild pain, 25 (16.67%) had moderate pain, 5 (3.33%) had severe pain and 3 (2.00%) had no pain. Of the patients who were in study (educational intervention) group 114 (75.00%) had mild pain, 16 (10.53%) had moderate pain,1 (0.66%) had severe pain and 21 had no pain (13.82%).

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.169[a]	3	.000
Likelihood Ratio	20.115	3	.000
N of Valid Cases	302		

Fig. 8 P value for Numeric Pain Score on Day 6-8

The analysis of data using Numeric Pain scale on day 6-8 revealed that there is significant difference in the pain score (p value- 0.001 using Pearson Chi-Square test) between the patients who received a standard preoperative protocol or control group and those who were given structured, individualized and elaborate counseling or the study group showing benefit of pre-operative counseling and education.

3) Using Numeric Pain Scale POD 12-15

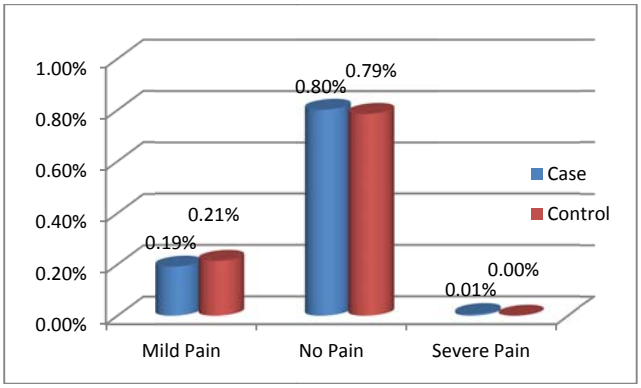

Fig. 9 Distribution of patients using Numeric Pain Score on day 12-15

The analysis of data revealed that out of the 150 patients who received standard education 32(21.33%) had mild pain, 118 (78.67%) had no pain and 0 (0.00%) had severe pain. Of the 152 patients who were in educational intervention group 29 (19.08%) had mild pain, 122 (80.26%) had no pain,1 (0.66%) had severe pain.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.201[a]	2	.549
Likelihood Ratio	1.587	2	.452
N of Valid Cases	302		

Fig. 10 P value for Numeric Pain Score on Day 12-15

The analysis of data using Numeric Pain Scores on day 12-15 revealed that there is no significant difference in the pain score (p value-0.549 using Chi Square Test) between the patients in the control (standard education) group and the patients in study (educational intervention) group.

There is a positive effect of a structured, individualized and elaborate educational protocol on the early post-operative pain score. Patients who received an individualized structured counseling had low pain scores as compared to the patients who received standard routine protocol.

Summary of Pain Scores:

- The mean pain score on the basis of Numeric Pain Score on day 1 was 5.467 (Numeric Pain Score) in the study (educational intervention) group while in the control (standard education) group it was 6.24.
- The mean pain score in the study group, on the basis of Numeric Pain Score on day 6-8 was 2.158, while in the control (standard education) group, it was 2.407.
- The mean pain score on the basis of Numeric Pain Score on day 12-15 was 0.25 in the study group while in the control group was 0.27.
- A positive effect of a structured, individualized and elaborate educational protocol on the early post-operative pain score was observed. Patients who received an individualized structured counseling had low pain scores as compared to the patients who received standard routine protocol.

D.Requirement of Additional Analgesia

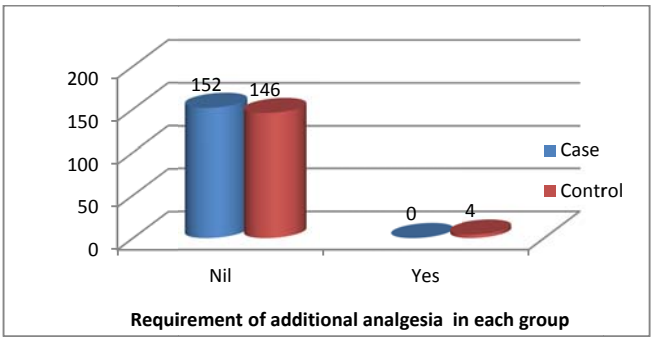

Fig. 11 Requirement of additional analgesia

Although four patients needed additional analgesia in the post-operative period in the control group, statistically there was no effect of a structured individualized elaborate patient education on requirement of additional analgesia in the post operative period. The p value was calculated to be 0.060 by Fischer exact test (p-value- > 0.05).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.108[a]	1	.043		
Continuity Correction[b]	2.321	1	.128		
Likelihood Ratio	5.653	1	.017		
Fisher's Exact Test				.060	.060
N of Valid Cases	302				

Fig. 12 P value for requirement of additional analgesia

E. Return to Daily Activities

	Dining	Washroom	Sch Work	Overall Satisfaction
Mann-Whitney U	11215.000	11047.500	9822.500	11241.500
Wilcoxon W	22843.000	22372.500	21450.500	22566.500
Z	-.279	-.625	-2.413	-.392
Asymp. Sig. (2-tailed)	.780	.532	.016	.695

Fig. 13 P values for various activities

F. Analysis of Return to Activity

The Mann Whitney U test was used to analyze the data for return to various activities in number of days.

Four parameters were taken into account to assess for the return to activity viz:

1. Ability to sit for dining in the post-operative period (in days).
2. Ability to independently to go washroom (in days).
3. Return to activities of daily living (in days) and
4. Return to normal work schedule (in days).

- The median period for ability to sit for dining was Day 1 in either group. There was no difference in the recovery of patients in the post-operative period among the study (educational intervention) and the control (standard education) group for return to dining. The p value calculated as per Mann Whitney U test was 0.78(>0.05) suggesting that the counselling had no effect on motivating patients for early return to dining in the post operative period.
- The median period of ability to independently go to the washroom in either group was Day 1.When the two groups were compared for independently going to washroom the p value was 0.532 (>0.05) suggesting that the structured individualized elaborate counseling had no effect on motivating the patients for independently going to washroom in the post operative period.
- The median day for return to activity of daily living in the study group was Day 3 while in the control group was Day 5.When the study and control groups were compared for return to activities of daily living it was found that there was an early return to activity of daily living in patients who were in the study group (educational intervention) as compared to the control (standard education) group. The p value was found to be less than 0.001.
- The p value calculated as per Mann Whitney U test for return to routine work Schedule was 0.016 (<0.05) suggesting that the study group who received structured individualized elaborate counseling had positive effect on return to routine work schedule.

G. Analysis of Overall Patient Satisfaction Score

Overall patient satisfaction was assessed using the standard feedback form by patient welfare department. The score was self reported by the patient on the basis of 4 parameters:

1. Time spent by the Doctor to explain diagnosis and treatment.
2. Attention from Doctors
3. Quality of Service- Efficiency, Warmth and Care of Service
4. Overall level of Service

The maximum score considering all these parameters was taken 4 and the minimum was taken as 0.

Using Mann Whitney U test the p value calculated was 0.695 which suggested that there was no significant difference in the overall satisfaction between the patients who received a structured individualized elaborate counseling and the standard education group.

VIII. Discussion

This study was conducted at the department of General Surgery, of a tertiary care hospital in North India, from September 2012 to March 2014. A total of 302 patients who had given consent were included in the study out of which 152 were in the study group and 150 were in the control group. The groups were matched for age, sex and thype of surgery performed.

The study was conducted to determine whether preoperative counselling through a structured individualised protocol had any effect on the postoperative outcome in terms of:

- postoperative pain score,
- requirement of additional analgesia,
- patient recovery and
- overall satisfaction.

When small samples are used, statistical power tends to be low, and the analysis may fail to show a relationship between the dependent and independent variables, even when there is one [16]. Statistical power refers to the ability of the design to detect true relationships among variables [17].

The sample size chosen was based on previous studies and ensured that the result of the statistical analysis would be significant. The sample chosen was large considering the small number of sample taken in the previous studies and also on the fact that very few studies have been done on the effect of preoperative patient education on post operative patient outcomes. Only one study has been done on patients undergoing laparoscopic cholecystectomy while there have

been no similar studies on patients undergoing hernia and anorectal surgeries.

The patients were followed at three different occasions in the post operative period viz post-operative Day 1, Day 6th-8th (the first follow up visit as per hospital protocol for surgical patients) and Day 12-15th (a period after which good recovery and return to daily routine is anticipated). A detailed charting of the pain score on these occasions with any requirement of additional analgesia was recorded for each of these patients. The return to various activities was noted to assess for the recovery process and the overall patient satisfaction score was obtained by the data collected by the patient welfare officers on the day of discharge. Multiple assessments at different time occasions ensured validity of the data collected and helped in ensuring that the patient followed the preoperative counseling instructions to the maximum based on his or her level of understanding and knowledge.

There was a significant difference in the pain scores on post operative day 1 (p value- 0.001) and post operative day 6-8 (p value- 0.001) for Numeric Pain Score (Pearson Chi-Square test). However, on day 12-15 post-operative day there was no significant difference in the pain cores in the two groups. These findings correlate with the studies which state that a structured individualized preadmission counseling lowers the pain score in the post operative period.

Educational Intervention patients reported lower pain scores at different events in the post operative period following personal management measures explained to the patient during the preoperative counseling. Study group had a uniformity in education as this was by a single person, with a standard structured format, leaving lesser chance for variation or error. In addition, it could not be ensured that control group receiving the standard preoperative education were provided with similar information and the content and type of information provided would have varied depending on the resident and nursing staff who would have counseled the patient at the time of admission. All of these factors impact upon participant knowledge, comprehension, motivation and recall ability. This is one of the most frequently quoted reason for poorer post operative expectations in the study group.

Various studies have shown that formal, individualized education programs [13]-[15] have a more positive effect on patient knowledge than informal education provision. The provision of information to control group was likely to be less formal due to pre-admission rostering practices, variable in content limiting information being provided and conducted in conjunction with routine assessments due to time constraints. This would be due to change in the residents with variable knowledge and communications skills, trying to complete the work in a limited time.

Santavirta et al. [18] studied the effects of individually planned teaching sessions on postoperative rehabilitation in patients undergoing Total Hip Replacement surgery. They found that the experimental group was clearly motivated, more satisfied and, to a certain degree, followed the rehabilitation instructions significantly better (P=0.02). In their study, at follow-up 2–3 months postoperatively, the experimental group knew better when to inform their doctors of potential complications. The findings of their study and this study support an individual teaching session on admission, preferably a structured one. We did not follow up the patients for that long and none of the patients were followed up for reporting any potential complications.

There have been criticisms in the past that most studies suffer from lack of long-term follow-up and do not examine the effect of preoperative education over time. Wilson-Barnett and Osborne [19] point out that the time between teachings and testing is usually rather short, making it difficult to test knowledge rather than recall. This was addressed by Santavirta et al. who followed the patients 2-3 months post-operatively. They reported no significant difference between the experimental and control groups following assessment of knowledge 2–3 months postoperatively.

The result of our present study were consistent with the findings of the previous study on long term outcomes, as the patients in both the study and control group did not have much difference in the pain scores on the 12th-15th post operative day with a p- value of 0.549. This might be explained by the fact that majority of questions would come up in the first 10 days of post operative period regarding issues like healing, pain, fitness to join. Hence with increase in the knowledge, the control group might match the study group.

Knoerl et al. [20] conducted a pre- and post-test study with surgical patients using patient-controlled analgesia (PCA) to evaluate the impact of structured education on knowledge of postoperative pain management, pain and satisfaction. Results showed that post test, the treatment group had a significantly higher knowledge of the use of PCA, higher satisfaction scores at 4 hours (P=0.03) and 8 hours (P=0.01) postoperatively and better pain control, pain reduction and pain management than the control group. This positive result may be due to the contents of the education, which included an instructional video shown to the patients. Patients were made to practice pressing control buttons on the PCA device and knowledge was assessed 4–72 hours postoperatively.

Lorig [21] points out that for effective teaching to take place, patients should be shown what to do and then asked to repeat the demonstrated action until they can do so easily. In Knoel's study, self-efficacy improved with this form of structured preoperative education. However, in a similar study Chumbley et al. [22] found little benefit in providing detailed preoperative information about PCA using either an information leaflet or an interview. The results showed that following the use of information leaflets, patients felt better informed and less confused, although the leaflets had no effect on other outcome measures. Chumbley et al concluded that a time-consuming preoperative interview is not justified as patients failed to recall many of the details.

Among the possible reasons given for the failure of preoperative information to show benefits was its inability to acutely change patients' long-held beliefs about postoperative pain in the post operative period, delayed ambulation, dietary dilemmas in postoperative patients, low level of education leading to inability to understand the information given in the

preoperative counseling session and hence not adhering to it. Another strong factor in Indian setting is the opinion of elders and friends about post-operative outcomes and myths associated with them, commonest being that taking milk or milk products leads to pus formation and that one should not move at all in the post-operative period. Occasionally the patient took little interest in the preoperative counseling session and assumed the whole exercise to be a wasteful procedure. This would explain no statistically significant difference in ambulation to dining and washroom in the early post-operative period between the two groups (p value-0.780 and 0.532). Likewise, the effect of social belief would be stronger than the effect of structured training once the patient goes back home, leading to the loss of statistically significant difference in pain scores at two weeks follow-up (p value-0.549).

The sample was not atypical and had three groups of patients who had to undergo different surgeries ensuring that the results were replicable in different groups. This would negate the effect of predominance of a single type of surgery on postoperative outcomes. The groups were balanced, a single surgery viz Laparoscopic Cholecystectomy would have negligible pain scores after 48 hours.

There was significant difference in the return to activity of daily living (p value-0.001) and work schedule (p value-0.016) between the two groups, with the study group going back to activity of daily living and scheduled work earlier than the control group. This could be due to the effect of preoperative structured education in the study group, where a detailed part included expected duration for return to work. This plays a psychological role in the mindset with the brain tuned to return to activity on the said date. Most of the patients in the study group had reviewed the booklet at home and had greater questions at the first follow-up.

Giraudet-Le Quintrec et al. [23] compared the impact of a collective multidisciplinary standardized information session with that of the usual verbal information on preoperative and postoperative anxiety of patients scheduled for total hip arthroplasty. The intervention group was significantly less anxious preoperatively (P=0.01), experienced significantly less pain postoperatively (P=0.04) and stood sooner (P=0.07) than the control group. The analysis was done on an intention to- treat basis. The findings support attending an educational program as it reduced preoperative anxiety, and better prepared the patients to cope with postoperative pain. Patients were given opportunities to ask questions at the information session. This concept was absent from our current study, also we studied only a few parameters for post operative recovery. Anxiety, which was dealt by several studies, was not assessed in the current study.

In the current study, on admission, patients in both groups (study and control) received education beginning from their visit to the out-patient department, admission counter, preoperative nursing counseling and pre anesthetic counseling that almost paralleled the contents of the booklet, so that by the time of discharge all patients had been exposed to the same information. This resulted in an associated reduction in postoperative pain, which helped the patients to cope better with hospitalization. However, there was no significant difference in certain activities like postoperative dining and going to washroom and the level of overall satisfaction between the groups; this could be due to the fact that on admission the control group were exposed to the same information that had been given to the study group before admission/surgery.

Overall patient satisfaction was assessed by a system developed by Patient Welfare Department at Fortis Escorts Hospital and Research Centre, and is very brief. Various other patient satisfaction scores have been developed which might be having better objectivity and reproducibility. This might have led to no statistical difference between the two groups when the overall satisfaction was studied (p value-0.695).

Structured patient education is a gradually developing field and more emphasis is being placed on this aspect by many corporate. Even the government bodies ask for feedback questions from the patients for continued renewal of contracts with the private hospitals. The current study has shown some positive trends of structured and individualized patient education.

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