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A HOSPITAL BASED INTERVENTIONAL STUDY TO ASSESS IMPACT OF PATIENT EDUCATION ON USAGE, HANDLING, STORAGE AND DISPOSAL OF OPIOID ANALGESICS

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ABSTRACT

Opioids are narcotic analgesics prescribed to treat persistent and severe pain. The recent increase in opioid overdoses, pain tolerance, and misuse suggests that it is important to provide patients with the best possible education after discharge. The findings suggest that current practices related to opioid medication sharing, storage, disposal, and education on these topics are sub-optimal. This study aims to evaluate the effectiveness of patient education on the storage, use, handling, and disposal of opioid analgesics. A prospective interventional study was conducted over 6 months. Out of 180 study participants, 90 served as control subjects while the remaining subjects received education, and data were collected before and after the education. During the study, it was found that more than half of the study participants did not lock the storage place for opioids. After the intervention, opioids were stored appropriately by study participants.About 70% of study participants planned to use opioids for mild pain, which decreased significantly after the education. It was found that 60% of study participants planned to share their prescribed opioids with others, which reduced after the education to 27% ultimately decreasing the likelihood of opioid misuse. In the pre-intervention study, approximately 65% of study participants were found to improperly dispose opioids by throwing them in household trash. In contrast, post-intervention revealed majority 75.5% of participants followed the proper disposal method. The study found that patient education improved opioid use, handling, storage, and disposal among patients and ultimately leading to a descrease in opioid misuse, and addiction.

KEYWORDS: Opioid analgesics, drug storage, drug disposal, pain medicine, misuse.

INTRODUCTION

Prescription opioids are potent analgesics used to manage severe pain but carry risks of addiction, dependence, and overdose due to their ability to induce pleasure and block pain perception by binding to opioid receptors.[1]

Studies of postoperative patients reveal significant excess opioids and unsafe storage and disposal practices. Opioid analgesics are widely used in hospitals for postoperative pain management, but their abuse and misuse are major concerns.[2] Over-prescribing and opioid abuse have resulted in substantial misuse, adverse events, and fatalities. The 2021 NSDUH report indicates that 3.3% (9.2 million) of individuals aged 12 and above misused opioids in the past year, with 8.7 million misusing prescription opioids.[3]

Focusing on patient education is crucial for enhancing safe opioid use. Following education, adoption of safe practices increased, underscoring the necessity for consistent and comprehensive educational efforts. Despite recognizing the importance of patient education, there remains a lack of comprehensive interventions addressing the entirety of opioid use, including handling, storage, and disposal.[4-5]

The EPA and FDA both recommend drug-take-back programs for disposing of unwanted opioids. However, the FDA advises flushing certain opioids or mixing them with unappealing materials for disposal, while the EPA advises against flushing any medications due to pollution concerns.[6]

This study aims to implement a multifaceted intervention focusing on opioid use, including standardized patient education materials and postoperative opioid minimization strategies. Through evaluating its impact on patient education and opioid use, the research seeks to improve opioid management and reduce abuse in hospitals.

METHODOLOGY

A prospective interventional study was carried out for a period of 6 months to assess the effectiveness of education regarding the handling of opioids in post-operative patients in a tertiary care hospital at Mangalore with a sample size of 180. The study protocol was approved by the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science, Mukka, Mangaluru.

INCLUSION CRITERIA: Individuals aged 18 years or above and Patient prescribed with opioid drugs during discharge for patient education.

EXCLUSION CRITERIA: Severely ill, unconscious and unresponsive patients.

SOURCE OF DATA: The required information was collected from patients and medical records. Concurrently, questionnaires addressing the usage, handling, storage, and disposal of opioid drugs to patients were used to gather information on handling of opioids.

STUDY PERIOD: The study period was divided into 3 phases:

STATISTICAL ANALYSIS: Statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn and a suitable statistical test was applied to analyze the data. The collected data were analyzed using Microsoft Excel 2019 and Social Science Statistics.

RESULT

In this study, 196 patients were prescribed with opioids during discharge of which 16 patients refused to participate in the study. The assessment of knowledge and practice of handling of opioids among 180 patients using pre-validated questionnaire revealed that the knowledge and practice of opioid handling among patients was poor. Thus patients were categorized into case and control group using block randomization technique and only 90 patients in the case group received education regarding the storage, handling, use, and disposal of opioid medication. The study analyzed their pre- and post-intervention results to assess the significance of patient education regarding these aspects of opioid medication.

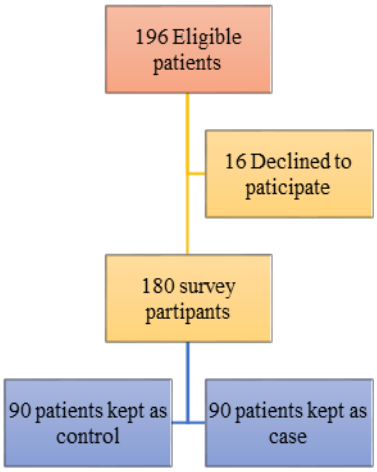

Figure 1: Of 196 eligible subjects, 180 subjects completed the survey.

It is very important for patients to know what drug they are taking. Initially, only 23%(n=21) of subjects correctly identified opioids, revealing a knowledge gap. However, after the intervention, an impressive 93% (n=84) could identify opioids correctly.

Initially, 70% (n=63) used opioids for mild pain, risking tolerance development. After the intervention, only 20% (n=18) continued using opioids for mild pain, showing a significant change ($p<0.001$) in behavior.Sharing opioid medication is risky due to misuse and addiction. Initially, 60% of patients admitted to sharing their medication with others, but after an educational intervention, only 27% continued this practice.This shift was statistically significant ($p<0.010$), demonstrating the intervention's effectiveness in reducing sharing and its associated risks.

Table 1: Assessment of the effectiveness of patient education on storage, usage, handling and disposal of opioid analgesics.

Characteristics		Case			Control		
Questions	**Answer choice**	**Pre Intervention**	**Post Intervention**	**P value**	**Pre Intervention**	**Post Intervention**	**P value**
Do you know which is the opioid tablet?	Yes	21	84	<0.001	23	26	0.308
	No	69	6		67	64	
Do you use opioids for mild pain?	Yes	63	8	<0.001	55	59	0.269
	No	27	72		35	31	
Do you share your opioid medicines with other people?	Yes	54	15	<0.001	61	58	0.319
	No	36	75		29	32	
Is the storage location of opi oid medication locked?	Yes	27	70	<0.001	29	32	0.319
	No	63	20		61	58	
Where do you store the leftover opioid pills?	Locked cupboard or wardrobe	5	20	<0.001	6	7	0.853
	Locked medicine cabinet or another box	10	34		12	10	
	On random table	37	16		32	34	
	Bedside	18	12		15	19	
	Kitchen cabinet	20	8		25	20	
Where do you typically get rid of unused opioid medication?	Mixing with wet waste	2	45	<0.001	4	3	0.897
	Sink or toilet	11	23		10	7	
	Household garbage	59	11		55	61	
	Return to pharmacy	0	4		0	0	
	Didn't recall or unsure	18	7		21	19	

Initially, just 25% (n=23) of participants locked their opioid medication, a concerning trend regarding the security of opioid medication. However, after the intervention, this improved in medication security practice significantly to 77% (n=70), with a highly significant p-value of <0.001 according to a t-test. Initially, patients stored their medication carelessly in open places like random tables (n=37), kitchen cabinets (n=20), or bedside areas (n=18). However, after education, there was a substantial shift towards more secure storage methods like medicine cabinets or lockable boxes (n=34) and cupboards or wardrobes (n=20). This highlights the importance of education in promoting proper, secure opioid medication storage to prevent unauthorized access and misuse.

The results from the questionnaire indicated that a significant number of patients were previously disposing of their opioid medication incorrectly, with approximately 65% (n=59) admitting to disposing of them in household garbage, while about 20% (n=18) either couldn't recall or were unsure of the proper disposal method. However, after the educational intervention, there was a remarkable improvement in patients' adherence to the correct disposal methods. Approximately 25% (n=23) of the patients began disposing of their medication by flushing it down the sink or toilet, while approximately 50% (n=45) opted to dispose of it by mixing it with wet waste. Remarkably, only 4 patients chose to return the medication to the pharmacy. These positive changes highlight the effectiveness of the education provided in promoting safe and responsible opioid disposal practices among patients.

DISCUSSION

The current study shows that patients initially had a limited ability to identify opioids, indicating a knowledge gap. However, a targeted intervention significantly improved their understanding on opioid medications. The majority of the patients were using opioids for mild pain which might induce tolerance in them, but after the intervention, this practice dramatically decreased with a statistically significant p-value of <0.001.

Patients more often shared their opioid prescribed drugs with others and were less aware that one dose of an opioid prescription could be dangerous to someone it was not prescribed to, but the educational intervention resulted in a substantial reduction in sharing of opioids, confirmed by a statistically significant p-value of <0.01 which matched with study conducted byKennedy-Hendricks A*et.al.*[7]

Few patients were initially not locking their opioid medication, but this changed notably after the education, a study conducted by De La Cruz M *et.al*, showed a similar result of patients not locking the opioid drugs before the education was provided to them regarding the storage of opioid medication.[8] After the education patients shifted from careless storage in open places like on random tables, bedside, and kitchen cabinets to more secure options, such as medicine cabinets or lockable boxes.

Additionally, incorrect disposal of opioids was prevalent before the education, with some patients unsure of the proper disposal method similar to a previous study conducted by McCauley J L *et.al.*[9] The study conducted by Reddy A*et.al* shows the improvement the survey participants showed on the proper way of disposal of unused opioid medications, encouraging them to practice the newly known methods[10], Following education, patients improved adherence to correct disposal practices, including flushing medications down the sink or toilet, mixing opioids with wet waste, or returning them to the pharmacy. This underscores the effectiveness of education in promoting safe opioid disposal practices.

CONCLUSION

This hospital-based study shows that patient education significantly improves the usage, handling, storage, and disposal of opioid analgesics. Patients who received targeted education demonstrated increased knowledge and safer practices in opioid management, leading to reduced unsafe use, improper storage, and inadequate disposal.

These results highlight the critical role of patient education in mitigating opioid risks and emphasize the importance of clear communication by healthcare providers. Implementing structured educational programs in hospitals can effectively enhance patient safety and reduce opioid-related adverse outcomes.

FUTURE PROSPECTIVES OF THE STUDY

Opioids are commonly used in hospitals to manage acute pain, but their misuse and abuse are significant concerns. Patient education can reduce the risk of misuse and abuse by ensuring patients understand proper usage, handling, storage, and disposal practices.

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