

Original Research

Hospital consumer assessment of healthcare providers and systems scores relating to pain following the incorporation of clinical pharmacists into patient education prior to joint replacement surgery

Erik HEFTI , Michael REMINGTON , Charles LAVALLEE 

Received (first version): 14-Jul-2017

Accepted: 15-Nov-2017

Published online: 18-Dec-2017

Abstract

Background: Pharmacist involvement has been shown to improve various aspects of patient care. Patients undergoing knee and hip replacement surgery generally experience post-operative pain and discomfort. Pain control can impact patient satisfaction, as reported by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey.

Objective: The current pilot study aims to measure the potential impact that incorporating pharmacists into preoperative patient education programs has on the response to select HCAHPS questions.

Methods: Patient responses to two select HCAHPS questions related to pain were recorded for a year prior to pharmacist involvement in a comprehensive preoperative patient education program (2012) and a year after pharmacists became actively involved (2013).

Results: In all reporting surgical patients, there was a modest 3.68% improvement in mean scores reflecting patient's feelings that hospital staff did "everything they could" to attend to their pain (mean₂₀₁₂=3.66, SD=0.63 versus mean₂₀₁₃=3.80, SD=0.43, p=0.018, Mann-Whitney U test). There was a non-significant 2.98% improvement in scores reflecting the level that pain was "well controlled" (mean₂₀₁₂=3.54, SD=0.651 versus mean₂₀₁₃=3.65, SD=0.554, p=0.069, Mann-Whitney U test) in surgical patients.

Conclusion: The results suggest comprehensive pharmacist involvement in patient education prior to joint replacement surgery may impact HCAHPS scores related to pain control. While the observed potential improvements were modest, the current results justify larger, multi-institution prospective studies to better elucidate the impact pharmacists can have on pain management in patients undergoing joint replacement.

Keywords

Pain, Postoperative; Pain Management; Patient Satisfaction; Pharmacy Service, Hospital; Pharmacists; Patient Education as Topic; Surveys and Questionnaires; United States

INTRODUCTION

High patient satisfaction is a necessity for healthcare facilities to remain viable and competitive in today's healthcare climate. Many factors contribute to patient satisfaction in a healthcare facility, including pain control. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is often utilized to measure patient satisfaction and perceived level of care.

Initially implemented in 2006, the HCAHPS survey has allowed for a national standardized comparison of patient satisfaction between hospitals. The survey, which contains 32 questions regarding various metrics of the patient experience, serves as a method of comparing performance data relating to patient care among hospitals. The survey

data is publically reported for patients and regulatory agencies to use for decision-making. The survey has several widely defined goals. Its public reporting services are meant to increase transparency of health care services to improve accountability, while also providing incentives for hospital systems to augment quality of care. The Affordable Care Act allowed the Center of Medicare and Medicaid Services to use HCAHPS scores to help determine reimbursement rates.^{1,2}

The importance of patient satisfaction, expressed via HCAHPS scores, has prompted several healthcare systems to explore new ways of improving multiple aspects of the patient experience. Pharmacists are critical for the accurate coordination of pharmacotherapy in the hospital setting. A pharmacist's training is focused on the safe utilization of drugs, making them the most qualified healthcare professionals to provide drug information to patients. In agreement with this, one survey utilized the Satisfaction with Information about Medicines Scale to compare the ability of nurses, physicians, and pharmacists to provide medication information to 140 cardiac patients. The study found that pharmacists were most likely to provide a satisfactory amount of information (92% versus 90% for nurses and 78% for physicians).³ An evaluation of an inpatient pharmacist-directed anticoagulation service (PDAS) at Henry Ford Hospital found several marked

Erik HEFTI. PharmD, MS, PhD. Department of Pharmaceutical Services, Sisters of Charity Hospital, St. Joseph Campus. Cheektowaga, NY (United States).
ehefti@chsbuffalo.org

Michael REMINGTON. RPh. Department of Pharmaceutical Services, Sisters of Charity Hospital, St. Joseph Campus. Cheektowaga, NY (United States).
mremingt@chsbuffalo.org

Charles LAVALLEE. PharmD. Department of Pharmaceutical Services, Sisters of Charity Hospital, Main Street Campus. Buffalo, NY (United States).
clavallee@chsbuffalo.org

improvements of site-created survey metrics compared with pre-PDAS scores in regards to the amount of information provided (i.e., an increase of 37.2%) and clarity of information (i.e., an increase of 35.2%).⁴ Based on this, the department of pharmaceutical services at Sisters of Charity Hospital, St. Joseph Campus began participating in preoperative patient education in order to improve pain management.

Pain management is a profoundly important metric of patient satisfaction, to the extent that the Joint Commission requires that organizations have established pain assessment and treatment policies. The Joint Commission has released a Sentinel Event Alert recommending the implementation of a secondary review of pain management for high-risk patients by either pain specialists or pharmacists.⁵ Improved pain control can improve overall inpatient satisfaction scores. Exemplifying this, a study that considered post-surgical pain control in a tertiary teaching hospital concluded that overall patient satisfaction improved significantly with pain control (i.e., 4.86 times greater than in comparison to uncontrolled). In that same study, patient satisfaction improved with the perception that hospital staff had made sufficient effort to control pain (i.e., 9.92 times greater than in comparison to insufficient).⁶ As such, many hospitals have developed pain management stewardship programs and preoperative classes.^{7,8} There are also published reports that show improvement in HCAHPS scores after pharmacist-led programs were developed.⁹

Patients receiving joint replacement surgery will inevitably incur some degree of pain and discomfort following the procedure. If possible, patients are often encouraged to prepare for the surgical procedure. One study found that 12% of a group of 441 post-surgical patients had “severe-to-extreme” pain and 54% had “moderate-to-extreme” pain at the time of discharge. Although there were several different types of surgeries performed, there were no significant differences in these percentages between the groups, including the orthopedic group.¹⁰ Another study considered a prospective cohort of 411 hip fracture patients and examined the association of post-operative pain on outcomes. The study found that patients with higher pain scores at rest had longer hospital lengths of stay, were less likely to be ambulating by the 3rd post-operative day, and had significantly lower locomotive scores at 6 months.¹¹ Preoperative education has been shown to improve patients’ post-operative pain control and preparation.¹²

At Sisters of Charity Hospital, St. Joseph Campus (Cheektowaga, N.Y.), a comprehensive, multi-disciplinary preoperative class for knee and hip replacement patients comprehensively incorporating pharmacists began in January 2013. The goal of this retrospective pilot study was to compare surgical patient responses to two pain-related questions in the HCAHPS survey before (2012) and after (2013) comprehensive pharmacist involvement in a preoperative education program. The mean scores from the questions: “During this hospital stay, how often was your pain well controlled?” and “During this hospital stay, how often did the hospital staff do everything they could to

help you with your pain?” were compared in 2012 versus 2013. This study considered the potential impact that pharmacists may have on reported pain-related HCAHPS scores in post-operative patients.

METHODS

Preoperative education program

A multidisciplinary preoperative patient education class involving pharmacists began in 2013. Pharmacists participate in the preoperative class for surgical patients and counsel patients postoperatively on their medication regimens. The class is approximately one and a half hours in duration and involves nurses, physical therapists, discharge planners, and pharmacists discussing how to prepare for surgery and what to expect following the procedure. Pharmacists are responsible for discussing the medications they will likely be prescribed and how to manage potential side effects. They counsel each patient following the procedure on their pain medications. The post-surgical patients at our facility generally receive hydromorphone for breakthrough pain and hydrocodone-acetaminophen combination products as needed for pain. Ketorolac (renally adjusted as appropriate) is also used in a fixed, scheduled number of doses after the procedure. Patient-controlled analgesia, usually hydromorphone, can also be added in many situations.

Pharmacists specifically discuss pain medications, their proper use, and potential side effects. Other medication classes, such as anticoagulants, are also discussed. The pharmacist participating in this education class generally presents a slide-based presentation (supplementary file 1) and answers questions from the patients. While different pharmacists may approach the presentation and counseling slightly differently, the core points outlined on Table 1 are consistently focused on. The class takes place twice a month and utilizes existing clinical pharmacists to participate. The existing staffing is adapted to allow for the pharmacist to participate in the class.

Data Collection

This research was approved by The Catholic Health System Institutional Review Board. Postoperative surgical patient HCAHPS scores were collected from the years 2012 and 2013. Data prior to 2012 was not available for this study. These years were chosen because the pre-surgical patient

How the pharmacist is a resource for drug information
The importance of asking if any medications need to be stopped prior to surgery
Drug allergies and how to report them prior to surgery
An overview of opioid and non-opioid pain medications
An overview of potential pain medication side effects and mitigation strategies
A discussion of opioid pain medication addiction, risks and realities
The importance of non-pharmacologic approaches to pain management
Anticoagulant medication overview, side effects, and management strategies
A discussion of what the pharmacy team does to ensure medication safety

class with comprehensive pharmacist involvement began in 2013 and could be compared to 2012. The surgeons performing the surgery were consistent, as were the medications commonly utilized pre- and post-operatively as per hospital pain management protocols. All de-identified score data collected were from patients admitted to the general postoperative unit at Sisters of Charity Hospital, St. Joseph Campus. It was not possible to specifically identify data for patients who attended neither the knee and hip replacement preoperative class nor the attending physician. The survey was conducted by a third-party vendor who randomly sampled the entire post-surgical patient population and supplied the score data. As the focus of pharmacist contribution was pain control medication, the scores for two HCAHPS questions: "During this hospital stay, how often was your pain well controlled" (question 13) and "During this hospital stay, how often did the hospital staff do everything they could to help you with your pain?" (question 14) were collected. The possible answers for both questions were "Always", "Usually", "Sometimes", and "Never". These answers were numerically transformed, with "Always" equaling a value of 4, "Usually" equaling 3, "Sometimes" equaling 2, and "Never" equaling 1. As this data was de-identified, there were no other patient demographic data available. Patients who did not respond to a considered question were excluded from the analysis.

Data Analysis

The normality of the numerically-transformed HCAHPS survey data was ascertained using the D'Agostino and Pearson Omnibus tests. Mean statistical comparisons were performed via the Mann-Whitney U test. Statistical analysis was performed on GraphPad Prism (v.4.03). Data are

expressed as mean and standard deviation (SD). Mean differences were considered significant at $p < 0.050$.

RESULTS

For HCAHPS question 13, 219 individuals out of 298 responded (73.49% response rate) in 2012 and 253 individuals out of 321 responded (78.82% response rate) in 2013. Specifically, question 13 asks "During this hospital stay, how often was your pain well controlled". Figure 1 shows a comparison of mean HCAHPS survey scores for question 13. This data was not normally distributed (D'Agostino & Pearson omnibus normality test), therefore, a non-parametric statistical comparison was utilized. There was a non-significant 2.98% increase in the mean score in 2013 compared to 2012 (mean₂₀₁₂=3.54, SD=0.651 versus mean₂₀₁₃=3.65, SD=0.554, $p=0.069$, Mann-Whitney U test).

For HCAHPS question 14, 220 individuals responded in 2012 and 250 individuals responded in 2013. Question 14 asks "During this hospital stay, how often did the hospital staff do everything they could to help you with your pain?" Figure 2 shows a comparison of mean HCAHPS survey scores for question 14. This data was not normally distributed (D'Agostino & Pearson omnibus normality test), necessitating a non-parametric statistical approach. There was a significant 3.68% increase in the 2013 mean score compared to 2012 (mean₂₀₁₂=3.66, SD=0.63 versus mean₂₀₁₃=3.80, SD=0.43, $p=0.018$, Mann-Whitney U test).

DISCUSSION

In this pilot study, we found potential small increases in patient reported pain control and small increases in patient

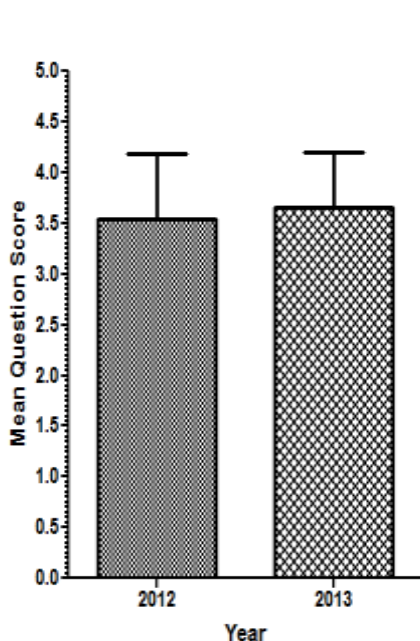


Figure 1. Mean score for HCAHPS question 13. (Frequency with which pain level was "well controlled"). Bars represent standard deviation, (*) indicates $p < 0.050$. See text for further details.

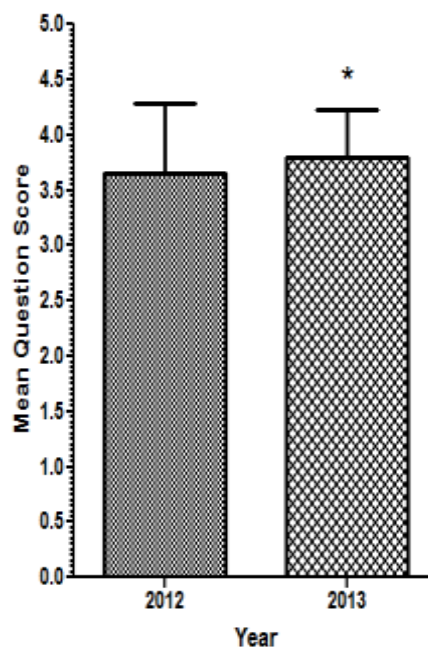


Figure 2. Mean score for HCAHPS question 14. (How often staff did "everything they could" to address pain control). Bars represent standard deviation, (*) indicates $p < 0.050$. See text for further details.

perception of hospital staff addressing their pain while admitted in 2013 versus 2012. The only change in the normal surgical procedures and personnel during this two-year span was the addition of a preoperative class with comprehensive pharmacist involvement to address pain medication and management to those patients undergoing orthopedic surgery. While modest, the improvements are consistent with the initial goal of the program. The data suggests a potential disparity between the attention to the patients' pain and the actual pain control. This could be due to the inclusion of a more diverse group of healthcare professionals that include the pharmacist. Pharmacists are among the most trusted healthcare professionals and this could potentially be increasing the patients' confidence that their pain management is a top priority.

These results are consistent with a recently published Cochrane systematic review on the topic of preoperative education and its impacts on perceived pain. Their analysis of the literature concluded that patients who received preoperative education prior to hip replacement surgery displayed an approximate 3% improvement in reported pain. The evidence for this was not determined to be of high quality, as there are few large trials with statistically significant findings to support the findings reported.¹³ A previous Cochrane systematic review from 2004 did not show preoperative education improving reported pain in knee or hip replacement patients.¹⁴ While pharmacy involvement was not isolated in the studies considered for this review, we believe a more comprehensive education program incorporating pharmacists has the potential to improve patients' perceived pain following joint replacement surgery. Furthermore, introducing preoperative education modestly improved patient satisfaction scores measured by HCAHPS survey responses in other surgical patients.¹⁵

Our results suggest that patients potentially perceive healthcare staff doing everything they can to address their pain following the involvement of pharmacists in preoperative education. In general, previous studies show patients who interact with pharmacy personnel are overall satisfied with pharmacy services and have positive views of pharmacists.^{16,17} Pharmacists are regarded among the most trusted healthcare professionals in the United States and their inclusion in patient education may assist in relieving anxiety related to medication prescribed postoperatively, although this was not considered in the current study.¹⁸ Preoperative anxiety has been suggested as a possible predictor of pain.¹⁹

The current study has some key drawbacks. The first involves the limited years that can be considered. Multiple aspects of the preoperative education program were modified since the final data point recorded in 2013. These included personnel, prescribers, and formulary changes. The sample sizes were not large and were confined to a single hospital within a larger health system. Patient demographics (e.g., age, sex, preoperative diagnoses) were not available as this data was completely de-identified. Patient-specific factors have been shown to impact postoperative pain control which could not be accounted

for in the current study.²⁰ Other information related to timeliness of medication administration could not be included in the current study and analysis of additional HCAHPS questions would benefit future studies. Furthermore, only patients undergoing hip or knee replacement had the option to take this class and the HCAHPS scores collected were from a combination of patients that received various surgical procedures. Future prospective studies in a larger patient population across multiple hospital sites have the potential to ameliorate many of the shortcomings associated with the current study. Future prospective studies will also allow for further variables and selective surgical patient populations to be accounted for which are absent from the current study.

The HCAHPS survey continues to evolve and the questions aimed at evaluating pain control will continue to evolve with it. While the current HCAHPS questions regarding pain control will be changing as of January 2018, the current study offers a snapshot into potential ways pharmacists may be able to contribute to improving these scores currently.²¹ Furthermore, with the opioid crisis gripping many parts of the United States, enhancing patient education with respect to proper use of pain medication continues to be of paramount importance. Another result of the opioid crisis is increased anxiety in individuals prescribed these medications. A goal of the program was to have a pharmacist address these concerns and put the use of opioids postoperatively into perspective and attempt to alleviate some concerns regarding these medications.

CONCLUSIONS

This pilot study represents an attempt to explore the impact that pharmacists can have on patients' perception of post-surgical pain control and the extent that the hospital staff did everything they could to control their pain. Our results show modest improvements in surgical patient-reported pain control and perception of hospital staff attending to their pain. Despite the preliminary nature of this work, the results of this study justify a larger, prospective investigation of the potential for pharmacists to improve pain control, HCAHPS scores, reimbursement and overall satisfaction in surgical patients.

ACKNOWLEDGEMENTS

We would like to thank Adele Battaglia for her help with this manuscript.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FUNDING

This study received no external funding or support.

References

1. Congress. Deficit Reduction Act of 2005. S.1932 (109th).
2. Patient protection and affordable care act. Public Law. 2010;111:48.
3. Auyeung V, Patel G, McRobbie D, Weinman J, Davies G. Information about medicines to cardiac in-patients: patient satisfaction alongside the role perceptions and practices of doctors, nurses and pharmacists. *Patient Educ Couns*. 2011;83(3):360-366. doi: [10.1016/j.pec.2011.04.028](https://doi.org/10.1016/j.pec.2011.04.028)
4. Makowski CT, Jennings DL, Nemerovski CW, Szandzik EG, Kalus JS. The impact of pharmacist-directed patient education and anticoagulant care coordination on patient satisfaction. *Ann Pharmacother*. 2013;47(6):805-810. doi: [10.1345/aph.1R686](https://doi.org/10.1345/aph.1R686)
5. Safe use of opioids in hospitals. *Sentinel Event Alert*. 2012;49(8):1-5.
6. Hanna MN, González-Fernández M, Barrett AD, Williams KA, Pronovost P. Does patient perception of pain control affect patient satisfaction across surgical units in a tertiary teaching hospital? *Am J Med Qual*. 2012;27(5):411-416. doi: [10.1177/1062860611427769](https://doi.org/10.1177/1062860611427769)
7. Fox CM. Implementing an integrative pre and post-operative educational intervention for older adults undergoing total hip and knee replacement. [Doctoral Dissertation], Grand Valley State University; 2014.
8. Ghafoor VL, Phelps P, Pastor J. Implementation of a pain medication stewardship program. *Am J Health Syst Pharm*. 2013;70(23):2070-2075. doi: [10.2146/ajhp120751](https://doi.org/10.2146/ajhp120751)
9. Traynor K. Pharmacists work to boost patient satisfaction scores. *Am J Health Syst Pharm*. 2013;70(10):836-839. doi: [10.2146/news130037](https://doi.org/10.2146/news130037)
10. Buvanendran A, Fiala J, Patel KA, Golden AD, Moric M, Kroin JS. The incidence and severity of postoperative pain following inpatient surgery. *Pain Med*. 2015;16(12):2277-2283. doi: [10.1111/pme.12751](https://doi.org/10.1111/pme.12751)
11. Morrison RS, Magaziner J, McLaughlin MA, Orosz G, Silberzweig SB, Koval KJ, Siu AL. The impact of post-operative pain on outcomes following hip fracture. *Pain*. 2003;103(3):303-311. doi: [10.1016/S0304-3959\(02\)00458-X](https://doi.org/10.1016/S0304-3959(02)00458-X)
12. Kearney M, Jennrich MK, Lyons S, Robinson R, Berger B. Effects of preoperative education on patient outcomes after joint replacement surgery. *Orthop Nurs*. 2011;30(6):391-396. doi: [10.1097/NOR.0b013e31823710ea](https://doi.org/10.1097/NOR.0b013e31823710ea)
13. McDonald S, Page MJ, Beringer K, Wasiak J, Sprowson A. Preoperative education for hip or knee replacement. *Cochrane Database Syst Rev*. 2014;(5):CD003526. doi: [10.1002/14651858.CD003526.pub3](https://doi.org/10.1002/14651858.CD003526.pub3)
14. McDonald S, Hetrick SE, Green S. Pre-operative education for hip or knee replacement. *Cochrane Database Syst Rev*. 2004;(1):CD003526. doi: [10.1002/14651858.CD003526.pub2](https://doi.org/10.1002/14651858.CD003526.pub2)
15. Kliot T, Zygourakis CC, Imershein S, Lau C, Kliot M. The impact of a patient education bundle on neurosurgery patient satisfaction. *Surg Neurol Int*. 2015;6(Suppl 22):S567-S572. doi: [10.4103/2152-7806.169538](https://doi.org/10.4103/2152-7806.169538)
16. Palombi LC, Nelson L, Fierke KK, Bastianelli K. Pilot study of patient perception of pharmacists as care providers based on health screening encounters with student pharmacists. *J Am Pharm Assoc* (2003). 2015;55(6):626-633. doi: [10.1331/JAPhA.2015.15058](https://doi.org/10.1331/JAPhA.2015.15058)
17. Perepelkin J. Public opinion of pharmacists and pharmacist prescribing. *Can Pharm J*. 2011;144(2):86-93. doi: [10.3821/1913-701X-144.2.86](https://doi.org/10.3821/1913-701X-144.2.86)
18. Norman J. Americans rate healthcare providers high on honesty, ethics. Washington, DC: Gallup; 2016.
19. Robleda G, Sillero-Sillero A, Puig T, Gich I, Baños JE. Influence of preoperative emotional state on postoperative pain following orthopedic and trauma surgery. *Rev Lat Am Enfermagem*. 2014;22(5):785-791. doi: [10.1590/0104-1169.0118.2481](https://doi.org/10.1590/0104-1169.0118.2481)
20. Perry F, Parker RK, White PF, Clifford PA. Role of psychological factors in postoperative pain control and recovery with patient-controlled analgesia. *Clin J Pain*. 1994;10(1):57-63.
21. Updated HCAHPS Survey Materials with NEW Pain Management Questions Have Been Posted. <http://www.hcahpsonline.org/WhatsNew.aspx> (accessed 11 June 2017).