IDENTIFYING HIGH PRESCRIBERS OF OPIOIDS: A MULTIVARIATE OUTLIER DETECTION APPROACH

Abstract

Research Objective: The purpose of this project is to build on the existing one-dimensional approach of identifying high prescribers of opioid pain medications and explore Multivariate Mahalanobis distance outlier detection methodology to appropriately identify high opioid prescribers compared to their peers.

Study Design: A retrospective pharmacy claims analysis of opioid prescribing patterns between August 1, 2011 and July 31, 2012 was conducted. Opioid prescribers were benchmarked against their peers based on multiple dimensions consisting of a number of 30-day adjusted opioid prescriptions per patient, average cost per patient day of therapy for opioid prescriptions, and average days' supply per opioid prescription was used for high prescribers and non-high prescribers to assess the impact of high opioid prescribers on cost and utilization.

Methods

Prescribers: All opioid prescribers to commercially insured patients aged 16 years or older (working age population) constituted the unit of analysis. A total of 506,724 opioid prescribers were identified.

Principal Findings: A total of 56,294 opioid prescribers, 86,055 (16.7%) men as high prescribers (multivariate outlier prescribers considering all five dimensions). High prescribers, on average, prescribed 3.5 times the number of 30-day adjusted opioid prescriptions per patient compared to one non-high prescribers (4.6 vs. 1.3 prescriptions), treated older patients (55.5 vs. 46.4 years), and were more likely to be located in competitors markets (456 vs. 252 opioid other prescribers). The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were 4.8 ($12.08 vs. $2.53) and 2.7 times (20.4 vs. 7.7) higher for high prescribers compared to non-high prescribers, respectively.

Conclusions: Examining prescribers simultaneously on multiple dimensions is a rigorous approach to identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist, with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Implications for Policy or Practice: Application of rigorous methods to identify outlier prescribers has important implications for policy and practice. Indeed results from this approach can help in more accurately identifying appropriate to educate prescribers on most any drug guidelines, minimum cost and optimum utilization.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Outlier (unusual values) detection is an important step in research because it can alter the analytical results. However, it should be noted that prescribers can be identified as an outlier on a single dimension (univariate) or in multiple dimensions (multivariate).

Univariate outliers – cases which have an unusual value based on a single dimension – can sometimes result in false positives. Therefore, examining prescribers on a single dimension is not sufficient when trying to identify high prescribers of opioids. A combination of multiple dimensions will provide a more robust analysis.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.

Background

Opioid (benzoidal analgesic) is a critical component of pain management in today's society. This medication has been prescribed to millions of people in the U.S., exacting a heavy toll on patients, prescribers and society. The high prevalence of abuse and misuse of opioids is a matter of concern to prescribers, policymakers, and public health officials.

This research applies both the one-dimensional and multivariate outlier detection methodology to identify high prescribers of opioids – a class of prescription pain medications with a high potential for abuse and misuse. Unfortunately, fewer than 40% of physicians are exploring methodologies to appropriately identify high prescribers of opioids.

The average cost per patient day of therapy for opioid prescriptions and the average days' supply per opioid prescription were compared for high prescribers and non-high prescribers to assess the impact of opioid high prescribers on cost and utilization.

By definition, high prescribers of opioids is defined as multivariate outlier prescribers on the basis of multiple dimensions. Prescribers simultaneously examining multiple dimensions is a rigorous approach of identifying high prescribers of opioids and can assist in minimizing misidentification of opioid prescribers. An improved methodological approach to detecting high prescribers can assist with greater specificity, identification of high prescribers with higher opioid prescribing patterns compared to their peers.