Differences in Prescription Opioid Analgesic Availability: Comparing Minority and White Pharmacies Across Michigan

Carmen R. Green,* S. Khady Ndao-Brumblay,* Brady West,† and Tamika Washington*

Abstract: Little is known about physical barriers to adequate pain treatment for minorities. This investigation explored sociodemographic determinants of pain medication availability in Michigan pharmacies. A cross-sectional survey–based study with census data and data provided by Michigan community retail pharmacists was designed. Sufficient opioid analgesic supplies was defined as stocking at least one long-acting, short-acting, and combination opioid analgesic. Pharmacies located in minority (≤70% minority residents) and white (≥70% white residents) zip code areas were randomly selected by using a 2-stage sampling selection process (response rate, 80%). For the 190 pharmacies surveyed, most were located in white areas (51.6%) and had sufficient supplies (84.1%). After accounting for zip code median age and stratifying by income, pharmacies in white areas (odds ratio, 13.36 high income vs 54.42 low income) and noncorporate pharmacies (odds ratio, 24.92 high income vs 3.61 low income) were more likely to have sufficient opioid analgesic supplies ($P < .005$). Racial differences in the odds of having a sufficient supply were significantly higher in low income areas when compared with high income areas. Having a pharmacy located near a hospital did not change the availability for opioid analgesics. Persons living in predominantly minority areas experienced significant barriers to accessing pain medication, with greater disparities in low income areas regardless of ethnic composition. Differences were also found on the basis of pharmacy type, suggesting variability in pharmacist’s decision making.

Perspective: Michigan pharmacies in minority zip codes were 52 times less likely to carry sufficient opioid analgesics than pharmacies in white zip codes regardless of income. Lower income areas and corporate pharmacies were less likely to carry sufficient opioid analgesics. This study illustrates barriers to pain care and has public health implications.

© 2005 by the American Pain Society

Key words: Opioid analgesics, healthcare access, racial and ethnic minorities, pain management, pharmacy decision-making, variability.

Racial and ethnic minorities face multiple barriers to adequate pain management* and are at risk for poor pain assessment and inadequate treatment.\textsuperscript{5,6,13,23,26-28} Considering pain’s significant socioeconomic impact on health, problems accessing quality pain care for racial and ethnic minorities are critically important because they are also vulnerable to the pain experience.\textsuperscript{23,26,32,38} Cleeland\textsuperscript{11-14} showed that racial and ethnic minorities with cancer face barriers to quality pain care. In a chronic pain population, African Americans tended to report that race and ethnicity influenced access to pain care and that chronic pain was a major financial burden for them more so than for whites.\textsuperscript{22}

Variability among healthcare professionals in their pain management decision making is well documented.\textsuperscript{36} In the study by Schulman et al\textsuperscript{44} with actors, African Americans and women received lesser quality care for chest pain than white men.\textsuperscript{17} Previous research demonstrated that physicians’ pain management goals varied on the basis of the type of pain.\textsuperscript{24} Physicians reported lesser goals for chronic pain, and their prescribing habits differed on the basis of race, ethnicity, age, and gender, with the pain complaints of minorities, elderly persons, and women receiving less attention than the complaints of white men.\textsuperscript{20,21,25,55,56}

In addition to physician variability, there are data to support pharmacist variability. Pharmacies located in minority neighborhoods are less likely to carry opioid analgesics when compared with pharmacies in white neighborhoods.\textsuperscript{19,55,56} In a randomly selected sample of New York City pharmacies, Morrison et al\textsuperscript{38} found that pharmacies in minority neighborhoods were significantly (ie, two thirds) less likely to carry sufficient opioid analgesic supplies when compared with non-white pharmacies.\textsuperscript{18} They also showed that 50% of all pharmacies sampled did not carry sufficient opioid analgesic supplies. Even

Received November 12, 2004; Revised June 6, 2005; Accepted June 10, 2005.

From the *Department of Anesthesiology, University of Michigan Medical School, and †University of Michigan Center for Statistical Consultation and Research, Ann Arbor, Michigan.

Address reprint requests to Carmen R. Green, MD, Associate Professor, Department of Anesthesiology, 1H247 University Hospital, 1500 E Medical Center Drive, University of Michigan Medical School, Ann Arbor, MI 48109-0048. E-mail: carmeng@umich.edu

© 2005 by the American Pain Society

after adjusting for robberies, burglaries, and illicit drug arrest at the precinct level, Morrison et al found differences in opioid analgesic availability on the basis of neighborhood composition. They also did not provide data on social factors (eg, income), although they reported that availability on the basis of pharmacy type (ie, corporate vs noncorporate) in minority or non-white pharmacies was not different. Overall, there is evidence for inadequate pain management for racial and ethnic minorities for many different reasons including physical barriers.

The article by Morrison et al prompted several letters to the editor attempting to explain their findings and further delineate limitations. Fear of robbery was suggested to be a more appropriate measure of a barrier to opioid analgesic availability than crime rate within a zip code area because it measures pharmacist’s perception of safety. Wilson and Kelling proposed that perception of safety varies on the basis of personal experiences and depends on how much disorder is tolerated in a neighborhood. Another letter suggested that current opioid stock might reflect decisions made previously rather than the current risk assessment obtained by using current crime statistics. Overall, these factors might account for the variability in opioid analgesic stock noted.

Similar to the study by Morrison et al, this study was promoted by reports from our minority patients (receiving care at a tertiary care academic pain center) who reported difficulty in the ability to fill their opioid analgesics at their local pharmacies. We designed a cross-sectional survey study to compare opioid analgesic availability in predominantly minority areas with predominantly white areas across Michigan to examine whether data obtained from New York City were generalizable to other settings in the United States. In addition, we planned to extend the work of Morrison et al by examining the entire state of Michigan (both urban and rural settings) while looking at opioid analgesic availability by pharmacy type (ie, corporate vs noncorporate) and examining how income influences availability. We hypothesized that pharmacies in minority zip codes would be less likely to stock prescription opioid analgesics when compared with those in white zip codes. More specifically, this study’s objectives were to (1) determine whether differences in prescription opioid analgesic availability exist between Michigan pharmacies in minority and white zip codes and (2) assess the reasons for potential differences in prescription opioid analgesic availability in Michigan pharmacies.

Methods

Methods and Measures

Institutional review board approval (with waived informed consent) was obtained from the University of Michigan Medical School. This cross-sectional survey study used 4 data sources: (1) pharmacy managers in corporate and noncorporate pharmacies, (2) 2000 US census data, (3) the 1991 Hayes Drugstore Directory, and (4) the 2002-2003 Hospital Phone Book.

Pharmacy Level Data

Sampling

Pharmacies were identified on the basis of the ethnic composition for the zip code in which they were located: (1) zip codes with ≥70% minority residents for minority zip codes and (2) zip codes with ≥70% white residents for white zip codes. The sampling frame for this study was defined as all pharmacies in the state of Michigan located in zip codes falling into the 2 ethnic composition categories. These zip codes (ie, primary sampling units) were divided into 2 strata defined by the 2 ethnic composition categories. A 2-stage sample selection process was then used to randomly select pharmacies located in the 2 zip codes (ie, white and minority).

Fig 1 details the sampling procedure graphically. First, zip codes were randomly selected from each stratum. For the 965 zip codes in which racial composition information was available by using US census data, 932 (96.6%) zip codes were classified as either ≥70% white residents (white) or ≥70% non-white (minority) residents. Only 3.4% of all zip codes with racial composition data were not classified, confirming an important level of geographic segregation by race and ethnicity in Michigan. Second, pharmacies were randomly sampled within the selected zip codes. For the 903 white zip codes, 102 zip codes were randomly selected, and 154 pharmacies were randomly selected (32% of the 481 white pharmacies available for sampling). For the 154 randomly selected white pharmacies, 119 were reached, and 97 were included in the analyses. However, 2 white pharmacies were not included because of a high amount of missing information. Among the minority pharmacies, all 29 minority zip codes identified were considered for sampling. For the 149 minority pharmacies included in the study, 118 pharmacies were reached. Pharmacies that could not be reached were not included in the study (35 white and 31 minority pharmacies). Minority pharmacies were oversampled to ensure that they were adequately represented in the study. These different sampling rates resulted in an average of 1 pharmacy per white zip code sampled, whereas 3 to 4 pharmacies per minority zip code were included in the study.

Weighting of Pharmacy Responses

Sampling weights were developed for the pharmacy-level data to account for unequal probabilities of selection within each zip code and overall pharmacy non-response. The sampling weights also allowed us to ensure that weighted statistical estimates used to make inferences about the study population were representative for the population of interest. Each pharmacy’s sampling weight (denoted by w) was computed as a product of 3 factors (w = w1∗w2∗w3). The first factor, denoted by w1, represents the inverse of a pharmacy’s probability (p) for being selected into the sample (w1 = 1/p). This probability is computed as the product of the probability for a pharmacy being selected from its zip code (equal to the number of sampled pharmacies in the zip code divided by the total number of pharmacies available for sam-
Figure 1. Pharmacy selection flow chart. †Two nonwhite zip codes did not have any pharmacies. ‡Two pharmacies in white zip codes had missing information and were not included in the analyses, resulting in 95 white pharmacies for analysis.
plling in the zip code) and the probability of the zip code being selected (ie, 102 of 903 for white zip codes and 29 of 29 for minority zip codes). The second factor, denoted by \( w_2 \), represents the inverse of the response rate for pharmacies in the same ethnic classification as the pharmacy (equal to 97 of 119 for pharmacies in white zip codes and 93 of 118 for pharmacies in minority zip codes). The third factor, denoted by \( w_3 \), represents a post-stratification weight developed to ensure that the weighted sample distribution for the pharmacies was identical to the distribution of the study population’s pharmacies (92% white, 8% minority). Applying the computed sampling weights to the pharmacy responses yielded a weighted sample size of 3832 pharmacies (3524 white pharmacies and 308 minority pharmacies). To maintain the original sample size and to make sure that significant results would not be an artifact of the larger weighted sample size, the sampling weights for each individual pharmacy were then normalized by dividing each weight by the average weight in the sample.

**Data Collection and Measures**

Information on the pharmacies’ contact information, location, and type (corporate and noncorporate) was obtained via the 1991 Hayes Drugstore Directory. Trained interviewers contacted the pharmacy managers at the selected pharmacies by using a study-specific telephone survey. Pharmacy managers were asked about the current availability of 15 common opioid analgesics at their pharmacy: long-acting (ie, controlled release oxycodone, controlled release morphine, fentanyl, levorphanol, and methadone), short-acting (ie, immediate release oxycodone, immediate release morphine, hydrocodone, butorphanol, and meperidine), or combination products (ie, propoxyphene, acetaminophen and hydrocodone, acetaminophen and codeine, aspirin and oxycodone, acetaminophen and oxycodone, and oxycodone terephthalate). The opioid analgesics selected are consistent with clinical guidelines and are commonly used in clinical practice for treating pain.4,11 Prescription opioid availability was measured by using the following ad hoc and iterative procedure: if at least one of the drugs in each opioid category (controlled release, immediate release, and combination opioid) was available, then the category of opioid was coded as 1 = available; otherwise, it was coded as 0 = not available; if a pharmacy had all 3 categories of opioids, then the opioid availability was coded as 1 = sufficient supply; otherwise, it was coded as 0 = insufficient supply. Morrison et al38 also successfully used this ad hoc technique. Retail pharmacists’ self-report of opioid stock is a reliable source of data.39

Data were also collected regarding opioid analgesic supplies and the reasons for insufficient supplies by using a study-specific phone survey. Pharmacy managers’ responses were classified as (1) low demand, (2) worries about illicit use, (3) too much paperwork, (4) fear of robbery, (5) drug disposal regulations, and (6) other. When a given pharmacy reported a barrier for any of the 15 opioids listed, the corresponding barrier was coded as 1 = yes (ie, low demand, etc); otherwise, it was coded as 0 = no. The 5 barrier measures obtained give an indication for the overall distribution of barriers to opioid availability among Michigan pharmacies. We also included pharmacy type (ie, corporate and noncorporate pharmacies)37 as a potential covariate in our models for sufficient opioid supply.

**Zip Code Level Data and Other Factors**

The natural racial segregation for Michigan zip code areas results in clusters of zip codes with similar geographic factors such as the sociodemographic composition for the zip code area (ie, age, income, urbanization) as well as proximity alternatives to medical provision. Thus, contiguous minority pharmacies in Michigan (located mostly in the Detroit and Saginaw areas) could be exposed to similar geographic factors, thereby potentially mediating the effect of pharmacy ethnic classification on opioid availability. To address this issue, data were collected at the zip code level on median age and income, proportion of residents ≧65 years old, and urbanization by using the Michigan Zip Code Tabulation Area analysis from the 2000 US census data.3 Zip code median income was used as a proxy for the zip codes’ socioeconomic status (often correlated with racial composition), with predominantly minority zip codes being mostly located in low income and urban areas (eg, Detroit metropolitan area). In addition, the higher population density in urban areas generates increased demand for more varied medication that can result in more sufficient opioid supplies. Because pain and pain-related conditions (eg, osteoarthritis) are more prevalent among the elderly, the proportion of residents ≧65 years old was included in the analyses to account for variability in opioid stock.

An alternative explanation for differences in opioid availability is hospital proximity. Residents living near a hospital might have better access to opioid analgesics through hospital pharmacies. Therefore, the presence of a hospital within each zip code was measured by using the 2002-2003 Hospital Phone Book. A dichotomous variable was computed by using an ad hoc procedure such as when there was a hospital within a pharmacy zip code, the hospital variable was coded as 1 (ie, at least one hospital in the zip code) or 0 (ie, no hospital in the zip code). Because the zip code level hospital proximity variable might be too broad, a hospital proximity variable was generated by using the ArcView 3.3 Geographic Information System (ESRI, Redlands, Calif). It was measured on the basis of whether there was a hospital within walking distance from the pharmacies (1 = yes, 0 = no). On the basis of the distance of 0.25-mile radius previously reported in the New York City study, we estimated that in more rural Michigan this distance could be defined as the area up to a ½-mile radius (ie, 0.4 mile) from a given pharmacy.39 Pharmacies and hospitals were mapped by using their respective addresses by creating a 0.4-mile buffer around each pharmacy and determining the presence (1) or absence (0) of at least one hospital within each pharmacy area.
Table 1. Sociodemographic Characteristics by Zip Code Racial Composition

<table>
<thead>
<tr>
<th>SOCIODEMOGRAPHIC CHARACTERISTICS</th>
<th>MINORITY ZIP CODES (N = 93)</th>
<th>white ZIP CODES (N = 95)</th>
<th>P VALUE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median zip code age (mean yrs ± SE)</td>
<td>188 32.3 ± 0.9</td>
<td>36.5 ± 0.5</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Median zip code household income (mean $ ± SE)</td>
<td>188 $32,034 ± $2,076</td>
<td>$49,434 ± $2,160</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Proportion of residents ≥65 yrs within each zip code (mean proportion ± SE)</td>
<td>188 .109 ± .008</td>
<td>.129 ± .005</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Rural zip code (% yes)†</td>
<td>132 0.0</td>
<td>13.2</td>
<td>.28</td>
</tr>
<tr>
<td>Pharmacy type (% corporate)</td>
<td>188 64.3</td>
<td>59.9</td>
<td>.61</td>
</tr>
<tr>
<td>Hospital in the zip code (% yes)</td>
<td>188 31.7</td>
<td>43.2</td>
<td>.42</td>
</tr>
</tbody>
</table>

Abbreviations: N, sum of normalized sampling weights; SE, design-based standard error for the estimated mean, taking clustering by zip code into account.

*Reported P values are for t tests (for age, median income, and proportion ≥65 yrs) and design-based Rao-Scott χ² tests.
†Zip codes located across rural and urban areas were not included in this analysis.

Statistical Analyses

All calculations and statistical analyses were performed by using procedures in the statistical software packages SPSS 11.5 (SPSS, Inc, Chicago, Ill) and STATA 8.2 (Stata Corporation, College Station, Texas). Inferential statistical analyses were performed by using the survey commands in STATA, developed for analyzing data arising from samples with complex multistage designs. Specifically, these commands were used to apply the previously described sampling weights in the analyses and to ensure that all statistical estimates were unbiased and representative for the population of interest. These commands were also used to calculate standard errors and confidence intervals (based on Taylor Series Linearization) for all statistical estimates that accurately reflect the clustering of the pharmacies by zip code and the stratification of zip codes into the 2 ethnic categories. Descriptive statistics for opioid analgesic supplies, barriers to opioid analgesic availability, presence of a hospital within the zip code and within the pharmacy neighborhood, zip code median age, zip code median income, ethnic composition, proportion of residents ≥65 years old, urbanization, and pharmacy type were computed at the pharmacy level. Two comparisons based on (1) zip code ethnic composition and (2) opioid availability were computed for all potential covariates by using design-based Rao-Scott χ² tests and t tests.

Design-based multivariate logistic regression models were fitted to the data to explore the relationship between zip code ethnic composition and opioid analgesic availability, adjusting for the zip code level covariates of age, urbanization, and presence of a hospital within the zip code effects as well as pharmacy type (corporate vs noncorporate) effects. Only variables independently associated with opioid analgesic availability were included in the models. Because of the high correlation of income with ethnic composition in the sampled zip codes, zip codes were classified into 2 subgroups: those with median incomes greater than or equal to the mean for all zip codes and those with median incomes less than the mean for all zip codes. To determine whether income moderates the relationship between zip code ethnic composition and opioid analgesic availability, separate logistic regression models were fitted in each of these 2 income subgroups by using commands appropriate for subgroup analyses in STATA. A P value <.05 was considered statistically significant for all analyses.

Results

Descriptive Analysis

Sociodemographic and Geographic Characteristics

From June 2003 to April 2004, 237 pharmacies were contacted, and 190 provided data for this study, yielding an excellent (80%) response rate (82% white vs 79% minority). Two pharmacies were not included because of incomplete data, resulting in 95 white and 93 minority pharmacies available for analysis. When the normalized weights accounting for unequal probability of selection, non-response, and post-stratification were applied to the responses, the total weighted sample size was 188 pharmacies (92% white and 8% minority pharmacies, a representative population). Table 1 provides sociodemographic characteristics by zip code racial and ethnic composition. The majority of the pharmacies were corporate or chain pharmacies (63.9%) and were located in urban areas (88.4%). Pharmacies located in white zip codes had higher zip code median age (P < .01) and higher zip code median income (P < .01). The proportion of residents ≥65 years old was higher among pharmacies in white zip codes than those in minority zip codes (P < .05). There were no significant differences in pharmacy distribution by pharmacy type or in the proportion of pharmacies located in rural areas between minority and white pharmacies.

Table 2 displays sociodemographic characteristics for the sample by opioid availability. Overall, most (84.1%) pharmacies met our criteria for having sufficient opioid supply. When comparing minority and white pharmacies, pharmacies located in white zip codes more frequently stocked sufficient opioid analgesic supplies (86.9% vs 54.2%; P < .01). Corporate pharmacies were less likely to have sufficient opioid analgesic supplies.
when compared with noncorporate pharmacies (58.8% vs 91.0%; \( P < .01 \)).

Regarding hospital proximity, 86.2% of the pharmacies in the study and 80% of the hospitals in Michigan (\( N = 189 \)) were successfully mapped by using geographic information system. Only 17 pharmacies (10.5%) had at least 1 hospital within a walking distance (0.4-mile radius), and 2 pharmacies were within walking distance of the same hospital. For the hospitals successfully mapped within walking distance of a neighborhood pharmacy, all were non–mental health hospitals (ie, general medical and surgical, rehabilitation and chronic disease facilities). Hospital proximity was not differently distributed on the basis of racial classification or opioid availability, and its low frequency prevented further analyses for the pharmacies studied. As shown in Table 1, the presence of a hospital in the pharmacy zip code was not associated with zip code racial composition or with opioid analgesic supplies.

### Barriers to Opioid Availability

The most common reason cited as a barrier to opioid availability was low demand (93.1%). However, this did not vary by opioid analgesic sufficiency, pharmacy racial composition, pharmacy type, level of zip code urbanization, level of opioid analgesic supply, median age, household income, or proportion of residents ≥65 years old. The fear that patients might use opioid analgesics for illicit purposes was the second most prevalent barrier identified (8.5%). Concern with illicit opioid analgesic use was more likely to be reported as a barrier by pharmacies with insufficient opioid analgesic supplies when compared with those with sufficient supplies (30.3% vs 4.3%; \( P < .01 \)). Again, this did not vary by pharmacy racial composition, pharmacy type, level of zip code urbanization, median age, household income, or proportion of residents ≥65 years old. Too much paperwork (1%) and fear of robbery (1%) were rarely identified as potential reasons for opioid analgesic unavailability. Measures of association between covariates and barriers were not computed for the least common barriers (ie, too much paperwork, fear of robbery, and drug disposal regulations) because of empty cells. Other responses cited for failing to supply opioid analgesics (eg, pharmacy was located in a small community, pharmacy was near a major medical center, and community residents do not have adequate health insurance coverage) were of low frequency and were not analyzed further.

### Nonrespondents

There were no differences when respondents and nonrespondents were compared on the basis of pharmacy racial composition or pharmacy type.

### Multivariate Analysis

Logistic regression models were fitted to the collected data in the 2 income subgroups by using sufficient opioid supplies (0 = no, 1 = yes) as the outcome variable while considering ethnic composition for the zip code (0 = minority, 1 = white), zip code median age, presence of a hospital in the zip code (0 = no hospital, 1 = at least one hospital), and pharmacy type (0 = corporate, 1 = non–corporate) as independent predictors. Both the proportion of residents ≥65 years old and low demand as a barrier to opioid availability were not significantly associated with sufficient opioid analgesic supply in the initial bivariate analyses and were not included in the models. Because of its low prevalence, a dichotomous variable indicating concerns with illicit use as a reason for opioid analgesic availability was also not included in the models. Urbanization was not included in the models because an empty cell was found in the bivariate analyses (ie, no pharmacies with insufficient supplies were sampled in rural areas).

The results obtained with the multivariate models demonstrated that when pharmacy type, median zip code age, and presence of a hospital in the pharmacy’s zip code were controlled for, pharmacies in white zip codes were more likely to have sufficient opioid analgesic supplies than pharmacies in minority zip codes (Table 3). When considering the subgroup for zip codes with insufficient supplies.
Discussion

Disparities in pain assessment and treatment on the basis of race and ethnicity are well documented.29 Diminished ability to obtain access to opioid analgesics in local pharmacies is a significant barrier to quality pain care. The present investigation provides evidence that Michigan pharmacies in predominantly minority areas were significantly less likely to have sufficient prescription opioid analgesic supplies when compared with predominantly white areas. Regardless of median income and median age, significant differences were found in opioid analgesic availability on the basis of ethnic composition. These results support the findings of Morrison et al38 that pharmacies in predominantly minority neighborhoods stock insufficient opioid analgesic supplies more so than those in predominantly white neighborhoods. However, these results also extend their findings by demonstrating the role of both social class and income on opioid analgesic availability. More specifically, the odds for not having sufficient opioid analgesic supplies are significantly higher among pharmacies in low income areas when compared with higher income areas, regardless of race. More importantly, we identified that the odds of having insufficient supplies in minority neighborhoods changed significantly on the basis of income (ie, high or low) (OR, 13.36 vs 54.42). Thus, social class and poverty seem to play a role for whites more so than minorities. Noncorporate pharmacies were also more likely to have sufficient opioid analgesic supplies than corporate pharmacies. These results suggest that if an opioid analgesic is prescribed for pain management, persons living in minority zip codes (even in higher income areas) or those living in low income zip codes (regardless of minority status) face additional barriers to quality pain care. Thus, vulnerable populations (eg, minorities and low income individuals) are at increased risk for inefficient and lesser quality pain care.

Although our results are similar to the New York City study by Morrison et al,38 there are several important differences that must be considered when comparing our study across Michigan. First, the sampling unit of Morrison et al (neighborhood) was defined as the space within a 0.25-mile radius for each pharmacy, whereas we defined our sampling unit by using the zip code tabulation area. Second, Morrison et al used crime data at the precinct level (although no differences were found). We did not include crime rate data because (1) crime rate is not significantly associated with sufficient opioid analgesic supplies, (2) crime rate data are available at the county level in Michigan, and (3) the usefulness of crime rate data is controversial and might be less important.
than pharmacists’ and residents’ perceptions of safety. No study to date had examined the role of regulatory requirements or pharmacist’s perceptions of safety and how these variables influence opioid analgesic availability at local pharmacies.31,39

Last, we confirmed the role of income on accessing healthcare and the quality of healthcare. When compared with minority pharmacies, the likelihood for a white pharmacy to have sufficient opioid analgesic supplies was higher when it was located in a higher income zip code than when it was located in a lower income zip code. These results provide evidence for the role of social class in determining access to healthcare for whites. More specifically, we found that income impacts opioid analgesic availability in white communities but had little impact on opioid analgesic availability in minority communities.33 Furthermore, the odds for having insufficient opioid analgesic supplies were greater for pharmacies located in minority and higher median age zip codes for low income areas. Beyond the clear implications for minorities, these results suggest that poor whites might have similar difficulty in having their opioid analgesic prescriptions filled in their communities as well.

To our surprise, we also identified that noncorporate pharmacies were more likely to carry sufficient opioid analgesic supplies than corporate pharmacies. Holdsworth and Raisch31 reported similar results when studying narcotic availability for patients with cancer pain. These findings suggest corporate policies or differences in pharmacy accountability might prevent stocking sufficient opioid analgesic supplies among corporate pharmacies. It is also important to note that our definition for sufficient opioid analgesic supplies might differ from the patient’s definition. For instance, a patient might find that a specific opioid analgesic (eg, methadone) is unavailable, but another in the same category (eg, sustained release morphine) is available but is unsuitable (eg, allergy). Overall, these results suggest variability in pharmacy managers’ decision making and the need for further studies.

Similar to Morrison et al, we found that the major reason for not stocking opioid analgesics in both minority and white pharmacies was low demand.38 Yet, neither study specifically captures what low demand means. This is particularly salient because chronic pain is ubiquitous, and pain complaints are common reasons for patients to consult a physician. The other responses cited for failure to supply opioid analgesics (eg, inadequate health insurance and pharmacy location) have equally important public health implications that deserve attention.16 However, examining health insurance coverage was beyond the scope of this study. Potential consideration must also be given to other plausible explanations for insufficient opioid analgesic supplies in minority communities. As suggested by Hermos, there is the possibility that white pharmacies overstock certain medications, whereas those in minority communities might understock medications.10 Holdsworth and Raisch31 suggested that pharmacists who are familiar with an individual patient might be willing to order necessary medications. Unfortunately, many patients no longer have relationships with their pharmacist as a result of change in pharmacy coverage. In addition, as cited by some pharmacy managers, low opioid analgesic availability might also be related to the presence of a hospital in the neighborhood. Yet, our results revealed that having a hospital near a pharmacy did not influence opioid analgesic availability. This study did not examine whether persons who live in minority zip codes traveled further to get their prescriptions filled. More study is necessary to appropriately measure opioid analgesic demand in comparison with opioid analgesic availability while also considering pharmacy location as a physical barrier to quality pain care.

Our results emphasize that although pain assessment tools, pain treatment guidelines and algorithms, and pain management practices are available, patients might still not be able to access quality pain care.15,19,41,49-53,58 For instance, implementing a triplicate prescription policy for schedule II opioid analgesics reduced prescribing for opioid analgesics in New York City.45,49 Although this policy was in effect during the New York City study by Morrison et al,38 pharmacists’ reports of opioid supplies could not be practically correlated.47 It is also important to note that the State of Michigan Official Prescription Program was discontinued before this study’s initiation. Healthcare provider variability in attitudes and decision making, corporate policies, and fears of regulatory scrutiny might influence the availability of opioid analgesics for pain management for all patients but minorities in particular.12,19,29,41,48,53,54

Despite these findings, some potential limitations must be acknowledged. First, the potential for response bias is present.7,30,40 To minimize the potential to intentionally report untrue behaviors (self-report bias), the survey was completed confidentially, and anonymity was promised to the pharmacy managers. Despite broad coverage, we did not test for regional differences in physician pain management decision making or healthcare provider’s perceptions regarding regulatory scrutiny. We also assumed that most pharmacists would get a needed medication if they knew the patient and had a day or so to obtain the medication. Second, an older version of the Hayes Drugstore Directory was used because of cost constraints, and as a result we might have missed a few pharmacies. Our response rate among busy pharmacy managers was excellent, and we did not identify any differences between respondents and nonrespondents. We believe that if a response bias is present, it did not affect our conclusions in a meaningful manner.

Third, our criteria for minority zip code (≥70%) is conservative but was based on the highest distribution of racial and ethnic minorities that allowed us to sample enough minority pharmacies within Michigan zip code tabulation areas. Although this study was conducted in
Michigan, more studies are necessary to test whether these findings are generalizable across the nation. Racial segregation and geographic clustering of pharmacies by race might also be a limitation that needs further examination. Pharmacists’ perceptions of safety were a minimal concern (1%) and are based on more than crime and burglary rates. We also did not examine lack of insurance as a factor, because it was beyond the scope of this study. Despite these limitations, these results provide alarming evidence for stark differences in the ability to access prescription opioid analgesics in Michigan on the basis of race.

In conclusion, our findings have important public health implications, demonstrating differences in the ability to access prescription opioid analgesics in Michigan. Persons living in minority zip codes throughout Michigan have significantly less access to sufficient opioid analgesics than those living in white zip codes. Pharmacies located in minority zip codes were less likely to have sufficient supplies, regardless of income, whereas income had an effect on pharmacies in high income white areas. Nonetheless, minorities and low income individuals have significantly less access to opioid analgesics than high income whites. Noncorporate pharmacies were more likely to have sufficient opioid analgesic supplies. In addition, having a hospital near a pharmacy did not influence opioid analgesic availability. These results provide a platform for outcome studies designed to understand how healthcare provider’s perceptions and patient demand might influence prescription opioid analgesic availability. Further study is necessary to determine whether healthcare provider variability and geographical variation in opioid analgesic availability contribute to inadequate pain treatment as well as disparities in quality pain care for racial and ethnic minorities in particular and for lower income persons in general. Finally, although standards of the Joint Commission on Accreditation of Healthcare Organizations assert that all patients have the right to pain assessment, barriers to quality pain care, current healthcare policy, regulatory scrutiny, and corporate decision making regarding pain management must be examined for potentially vulnerable populations.6-19 More studies are needed to identify and address policies that disproportionately affect vulnerable populations (such as minorities and low income persons) and that might subsequently limit their ability to access quality pain care.

Acknowledgments

We thank the pharmacies and pharmacy managers who participated in this study. We thank John R. C. “Jack” Wheeler, PhD, Professor of Health Management and Policy, for his invaluable assistance and wise counsel. We also wish to thank Ms. Andrea Black, Ms. Cecelia Calhoun, Ms. Tamara Hart-Johnson, MS, Ms. Kyungmin Kang, and Mr. Andrew Nagrant, MPH, for their assistance in collecting data for this project. We also thank Ms. Anna Rhee and Robin Williams for their technical assistance.

References


32. McCaffrey DJ, Bentley JP, Banahan BF, Garner DD, Wilkin NE: Results from the parallel and statewide surveys of community pharmacy management and operational practices. Miss Pharm 26:15-18, 1999


