Analysis of the 2017 Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey Data

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Analysis of the 2017 Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey Data

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Abstract

Introduction: Montgomery County, Ohio, has higher overdose rates than the national or state averages: approximately 50% are related to prescription opioid misuse. A community assessment was conducted to better understand Montgomery County’s adult population’s connection with, and opinions of, prescription opioid medications. Methods: Data for 284 anonymous internet surveys were compiled and subjected to a descriptive analysis of responses and trends. Response patterns were used to recommend appropriate interventions. Results: Respondents were well-educated (91.9%), employed (76.7%), Caucasian (89.8%), females (79.2%) who resided (82%) and worked (66.5%) in Montgomery County (82%). The risk from personal misuse of prescription opioids was perceived by 91.0% of respondents, but only 77.7% incorporated mitigating behaviors. A large majority of respondents perceived the risk of sharing prescription opioids (87.6% giving, 85.2% receiving). However, fewer (71.9% giving, and 70.8%, receiving), respondents engaged in mitigating practices. The risk of taking prescription medications for reasons other than their intended use was recognized by 94.2% of the respondents. Nearly all (91%) respondents reported never taking prescription opioids for reasons other than their intended use. The vast majority (92%) of respondents disagreed with the notion that prescription medications should be accessible to everyone, yet only 35.3% stored medications securely. Similarly, 64.9% of respondents indicated that keeping unused prescription opioids was unacceptable, only 34.6% used opioid medication disposal sites.

Conclusion: Respondents, despite having good risk perception, did not report mitigating behaviors to match risk perception. Prevention measures impact behavior are recommended to curbing the opioid epidemic versus education-only interventions. 

Keywords: behavior, sharing, abuse, regulations, mitigation, intervention
Analysis of the 2017 Montgomery County Adult Risk Perception of Prescription Opioid Misuse

Introduction

An opioid epidemic is occurring throughout the United States; from 2000 to 2014, the
death rate from drug overdoses increased 137% with rates for opioid overdose deaths increasing
by 200% (Rudd, Aleshire, Zibbell, & Gladden, 2016). Montgomery County, Ohio, has
witnessed higher rates than the national and state averages, becoming the top city for opioid
related deaths per capita in the nation (So, 2017). From January 2010 through August 2017,
there was a 215% increase in opioid related deaths with a projected increase of 530% by the end
of the 2017 (Public Health - Dayton & Montgomery County [PHDMC], 2014; So, 2017).
Behavioral health treatment trends indicated that clients treated for opioid disorders between
2009 and 2014 increased by 52% (Montgomery County Alcohol, Drug, and Mental Health
Services [ADAMHS] Board, 2014). At least half of unintentional drug overdose deaths
mentioned benzodiazepines (52%) and prescription opioids (50%) (PHDMC, 2014; Center for
Interventions, Treatment, and Addictions Research [CITAR], 2014). In an effort to address the
Montgomery County opioid epidemic, Public Health - Dayton & Montgomery County
(PHDMC) implemented an emergency framework system based on the National Incident
Joint Information Center (JIC) was established to coordinate the activities of numerous city,
county, and state agencies through the Community Overdose Action Team (COAT). The COAT
was divided into eight branches, each providing a different avenue for intervention; the
organizational structure is illustrated in Figure 1. The Prevention Branch asked the Montgomery
County Prevention Coalition, along with the Montgomery County Alcohol, Drug, and Mental
Health Services (ADAMHS) agency, to spearhead a community assessment project to collect
“personal views on health and substance use” (ADAMHS & PHDMC, 2017, landing page, first sentence) from people who live or work in Montgomery County.

Figure 1. Montgomery County Community Overdose Action Team (COAT) organizational chart (PHDMC, 2017).
Notes: MCOEM = Montgomery County Office of Emergency Management; TBD = to be determined.

The assessment project started in March of 2017 with the creation of logic models created to explain suspected root causes contributing to marijuana use and prescription opioid misuse in Montgomery County. Based on these identified root causes, a survey was created that inquired about demographics, risk perceptions of marijuana use, and risk perceptions of prescription opioid misuse of the adult population working and/or living and/or attending school in
Montgomery County, Ohio. The survey was refined through group discussions with the final product posted to a secure website for surveys in April 2017 (see ADAHMS & PHDMC, 2017).

In July of 2017, data were provided to this manuscript’s author for contextualization and recommendations for action. The demographics information and the prescription opioid answers were analyzed due to a focus on prescription opioid misuse and potential interventions.

**Statement of Purpose**

The purpose of this manuscript was to analyze data from the 284 people who resided, worked, or attended school in Montgomery County and completed the Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey via the internet as of July, 2017. Data from the anonymous surveys were compiled and subjected to a descriptive analysis of responses and trends. Response patterns were used to recommend interventions from the survey team’s logic model.

**Background**

The Montgomery County Prevention Coalition and the Montgomery County ADAMHS established two related root causes suspected of contributing to the local opioid epidemic based on their individual agency experiences with the Dayton community. These causes were identified for members of the local community who are expected to comply with the appropriate actions if properly educated on the risks. The first root cause postulated that there was a lack of education within the general population regarding safe opioid medication use. This lack of education was thought to contribute to misperceptions about the safety and legality of misusing prescribed opioids along with misperceptions about the safety of sharing opioid medications. The second root cause proposed that prescription opioids were simply ‘too accessible,’ due to being over-prescribed by medical practitioners and not being disposed of and/or stored properly.
by consumers. In 2010, at least 79 prescription opioid doses were dispensed per person in
Montgomery County compared to the statewide rate of 67 per person (Ohio State Board of
Pharmacy, 2006–2017a, b). In light of the doctor/patient relationship, the assessment team
deduced that the general public was not reporting physicians who were overprescribing. In 2010,
the number of dispensed opioid doses per capita for Montgomery County was 15.27, higher than
the statewide average of 13.44; the county rate has remained higher than the state rate since 2010
(Ohio State Board of Pharmacy, 2006–2017a, b). The Montgomery County Prevention
Coalition, along with the Montgomery County ADAMHS Board, hypothesized that
misperceptions about the risk of opioid medications were leading to improper prescription opioid
storage and disposal by the general public. Obtaining prescription medications from multiple
sources was theorized to be the most likely reason for having excess supply. Adding to this
problem was the location of the disposal/take back sites; all the sites in Montgomery County
were located in law enforcement centers, which may not be a convenient or comfortable venue
for consumers, especially for disposing of illegally obtained opioid medications. The
Montgomery County Prevention Coalition and ADAMHS created and conducted the
Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey for assessing
their local community.

Purpose of the Survey

The opioid community assessment team was tasked with collecting information from
Montgomery County adults to better understand their “connection with, and opinions of,
prescription opiate medications” (Montgomery County Prevention Coalition, 2017). In their
work on this assessment, the Montgomery County Prevention Coalition tasked members from
two of its Marijuana and Opiate Workgroups to find relevant local data. They identified limited
local information via the Dayton Area Drug Survey (DADS) (https://medicine.wright.edu/citar/dayton-area-drug-survey). DADS is a study of drug use in school children living in Montgomery County, not adults. Therefore, it did not provide relevant data for the adult-focused portion of the COAT Prevention Branch mission. Consequently, the community assessment team collaborated and developed a survey de novo to collect this important local data.

**Survey Development Methods**

**Underlying rationale and logic model.** The logic model, included as Appendix A, illustrates the reasoning underlying the survey development. It included proposed prevention strategies for decreasing prescription opioid misuse based upon the identified root causes. A search for validated, opioid-related community surveys reportedly revealed several related to abuse and addition, but none related to the general understanding of medication use, storage, and disposal identified in the logic model. As such, original survey questions were developed by the members of the Montgomery County ADAMHS and the Montgomery County Prevention Coalition to gather data that would help identify potential interventions. Survey questions were reviewed at several COAT prevention branch meetings to allow for feedback and refinements. The final product was uploaded onto a secure cloud-based software system (Survey Monkey, https://www.surveymonkey.com/r/MPMS-Adult).

**Ethical collection of data.** Under Ohio Revised Code 340 (http://codes.ohio.gov/orc/340), review of the Montgomery County Prevention Coalition and ADAMHS’s survey and data collection by an Institutional Review Board (IRB) was not necessary because the data were anonymous (see Appendix B). The analysis of the anonymous
data for this manuscript was not subject to IRB review under 45 CFR part 46 (Appendix C; also University of California Irvine Office of Research, 2015).

**The survey questions.** The survey (Appendix C) included nine demographic questions that covered the following categories: county and zip code of residence, race/ethnicity, gender, age, level of education, employment status, employment in Montgomery County (yes/no), and school attendance in Montgomery County (yes/no).

The survey also included nineteen prescription opioid misuse questions covering the following six categories: taking more than prescribed (three questions), giving to family or friends (three questions), receiving from family or friends (three questions), taking for reasons other than prescribed (four questions), disposal methods (four questions), and storage methods (two questions). The first three categories incorporated two questions with answers on a four-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree and All the Time, Sometimes, Rarely, Never), and one question that allowed for multiple answers to establish reasons for the respondent’s perceptions/actions. The fourth category had similar formats for the first three questions, but also included a fourth safety-based question that relied on a four-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree). The fifth category incorporated two questions with multiple answers and two questions with dichotomous answers (yes/no) related to disposal of opioid medications. The sixth category relied on one question with multiple answers and one question that incorporated a four-point Likert scale (Strongly Agree, Agree, Disagree, Strongly Disagree) related to storage of opioid medications.

Once the survey was uploaded to Survey Monkey, a link was advertised on the various COAT agencies’ websites. Additionally, representatives from the various COAT agencies sent the link and asked to forward it to co-workers, families, and friends in order to provide greater
distribution of the survey. Over a four-month period (April – July 2017), 284 surveys were completed and those data were provided for this analysis. The survey remained open to gather additional information regarding the effects of any implemented prevention strategies.

Data Analysis

Literature Review

A literature search was conducted prior to starting the data analysis. The twenty articles reviewed are outlined in Table 1. Six of these articles focused on risk perceptions of various communities in regards to opioid medications. The communities targeted in the research articles included Americans, tribal nations in Washington State, Appalachian Americans, opioid abusers, and non-abusing young adults. Generally, the articles indicated that adults were aware of the risks of opioid misuse, but did not act on their perceived risk. Eight articles discussed risk factors related to prescription opioid misuse. Prior use of prescription opioids, anxiety/depression, catastrophic thinking, prior illegal drug use, geographic location of misuse (i.e., in one’s own home versus at a friend’s house), and age were the main risk factors identified by the eight articles. Three papers discussed potential prevention strategies to help mitigate prescription opioid misuse; these involved social media campaigns; the vested interest theory (VIT), which postulates that behavior can be modified through hedonic relevance of attitudes; and improved terminology on screening questionnaires intended for use in medical settings related to opioid misuse. Lastly, three papers discussed programs to help monitor doctor’s prescribing habits and/or pharmacy intervention methods.
## Table 1

*Literature Review Articles Grouped into Four Categories Associated with the Misuse of Prescription Opioids*

<table>
<thead>
<tr>
<th>Article</th>
<th>Risk Perceptions of Various Communities</th>
<th>Risk Factors Associated with Prescription Opioid Misuse</th>
<th>Prevention Strategies to Help Mitigate Prescription Opioid Misuse</th>
<th>Programs to Help Monitor Prescribing Habits and/or Pharmacy Intervention Methods</th>
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<tr>
<td>(Barry et al., 2016)</td>
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<td>(Radin et al., 2015)</td>
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<td>(Rowe, Santos, Behar, &amp; Coffin, 2016)</td>
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<td>(Rudd, Aleshire, Zibbell, &amp; Gladden, 2016)</td>
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<td>(Votaw, Wittenauer, Connery, Weiss, &amp; McHugh, 2017)</td>
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<td>(Arteta, Cobos, Hu, Jordan, &amp; Howard, 2016)</td>
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<td>(Frank et al., 2015)</td>
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<td>(Martel, Wasan, Jamison, &amp; Edwards, 2013)</td>
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<td>(Stumbo, Yarborough, McCarty, Weisner, &amp; Green, 2017)</td>
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<td>(Donaldson, Siegel, &amp; Crano, 2016)</td>
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<td>(McNeely, Halkitis, Horton, Khan, &amp; Gourevitch, 2014)</td>
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Table 1

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<tr>
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<td>(Hwang, Turner, Kruszewski, Kolodny, &amp; Alexander, 2016)</td>
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<td>(Norwood &amp; Wright, 2016)</td>
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<td>(Vogel, 2015)</td>
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**Methods**

Data from the first three months of the survey were gathered from the Survey Monkey website in July 2017. Each of the survey questions had data corresponding to the raw numbers of respondents completing that question and the percentages of each selected answer. The raw numbers and percentages for each question were provided in a table format on an Excel spreadsheet. Only questions related to demographics and misuse, storage, and disposal of prescription opioids were analyzed for trends. Questions related to marijuana were not analyzed as the focus of this article was risk perceptions related to prescription opioids. Recommendations for misuse mitigation strategies were established based on proposed methods identified during the literature search along with the trends identified for each question.

**Results**

**Demographics.** Demographic questions revealed that 82% of the respondents lived in Montgomery County, with the top three zip codes where respondents lived being 45327, 45459, 45325. In regards to race/ethnicity, 89.8% of the respondents self-reported as Caucasian, 4.9% as African American, 1.4% as Asian, 1.1% as Hispanic or Latino, 1.1% as Middle Eastern, 1.1%
as other, and 3.2% preferred not to answer. The majority of the respondents (79.2%) were female, with males representing 17.6% of the respondents. Gender-nonconforming respondents represented 1.1% of respondents, with an additional 2.1% of the respondents preferring not to answer this question. Age of respondents ranged from 19 to 78 years old (mean 44 years, standard deviation ± 13.22 years). Education levels had a wide range as well. Approximately two-thirds (65.9%) of the respondents had some form of college degree (associate’s, bachelor’s, master’s, or Doctorate). Few respondents (4.9%) had a professional degree with no college, slightly less than a quarter of the respondents (21.1%) had some college with no degree, and only 8.1% of the respondents had a high school diploma or less. ‘Employed for wages’ represented the largest category for employment status (65.8%). Individuals who were self-employed represented 10.9% of respondents, and those who were out of work (whether looking or not looking for work) made up 0.8% of respondents. Homemakers made up 6.0% of respondents, with lesser representation for students (4.6%), retirees (5.3%), disabled (4.6%), and ‘other’ categories (2.1%). A majority of respondents (66.5%) worked in Montgomery County with a minority (3.7%) indicating they went to school in Montgomery County (only 27 of the 284 respondents answered the school question).

**Personal prescription opioid misuse (for pain relief/medical treatment).** Questions related to the personal use of prescribed opiates revealed a strong perception of risk related to personal misuse. Respondents largely disagreed (91%: 59.7% strongly disagreed, 31.3% disagreed) with the perception that it is okay to take more of the prescribed medication that what was directed by the doctor. This was reinforced by the fact that 77.7% of respondents reported that they never took more of a prescribed medication than what was directed by their doctor. Furthermore, 15.6% of the respondents indicated they ‘rarely’ take more than what their doctor
directed, and only 6.6% indicated they ‘sometimes’ take more than what their doctor directed. Seventy-three respondents did not answer the questions related to personal use of prescribed opioids. Reasons for taking more than what was prescribed mostly implicated uncontrolled pain (66.7%) and disrupted sleep (35.4%). In regards to the question about reasoning behind excess consumption, respondents were instructed to choose all that apply; only 48 respondents answered this question. The low response rate can lead to a selection bias and increases the chance of assuming a false premise as true.

**Sharing (giving to family and friends).** When asked if it is okay to share prescribed opiates with family or friends, the majority of respondents disagreed (87.6%: 52.4% strongly disagreed, 35.2% disagreed) (Note: these percentages were based on the 210 of 284 respondents who answered the question). This perception was somewhat supported by individual action as 71.9% of the respondents indicated they ‘never’ share prescription medications with their family or friends. Slightly less than one-quarter (22.9%) of respondents indicated they ‘rarely’ share prescription medications; 4.8% indicated they ‘sometimes’ share prescription medications; and one respondent indicated they share prescription medications ‘all the time’. Seventy-four respondents did not answer questions related to sharing prescription opioids with their family and friends. There were a variety of reasons for why respondents said would share their prescription medications. One-half (50%) of the respondents had extra medication and had a family member/friend that needed it. One-fifth (20%) of respondents simply shared their prescribed medications because they were asked (whether they had extra or there was a need). Financial difficulties, based on the following reasons, led to prescription medication sharing as well: family members/friends could not afford the medication (28.3%), they did not have insurance (31.7%), or they had insurance but it did not cover some of the needed prescriptions
(23.3%). In regards to the question about reasoning behind sharing, respondents were instructed to choose all that apply; only 60 respondents answered this question. The low response rate can lead to a selection bias and increases the chance of assuming a false premise as true.

**Sharing (receiving from family and friends).** On the complementary side of giving medications, a series of questions addressed respondents who accepted/received prescription opiates from their family or friends. The majority of respondents disagreed (85.2%: 48.8% strongly disagreed, 36.4% disagreed) with the notion that it is acceptable to take prescription medications given to them by their family and/or friends. This was reinforced by the fact that 70.8% of the respondents indicated that they ‘never’ take prescription medications given to them by family or friends. Approximately one-quarter (25.4%) indicated they ‘rarely’ take prescription medications given to them by family or friends, 3.3% indicated they ‘sometimes’ take prescription medications given to them by family or friends, and one respondent indicated they take prescription medications given to them by family and friends ‘all the time’. Seventy-five respondents did not answer the questions related to receiving prescription opioids from their family or friends. Reasons for accepting a family member’s or friend’s opioid medications were largely focused on convenience and financial factors. Just over one-half (57.4%) of the respondents indicated that they accepted prescription opioids from their family or friends simply because they had the medicine the respondent needed. Another 23.0% of the respondents accepted medication from their family/friends because they did not have time to go to the doctor. From the financial perspective, 47.6% of the respondents accepted opioid medications from their family/friends secondary to not having the money to go to a doctor (19.7%), not having the money to pay for a prescription (16.4%), or being uninsured (11.5%). In regards to the question about reasoning behind sharing, respondents were instructed to choose all that apply; only 61
respondents answered this question. The low response rate can lead to a selection bias and increases the chance of assuming a false premise as true.

**Personal misuse (recreational/illicit).** When respondents were questioned about taking prescription medications for reasons other than their intended use, almost all of them disagreed (94.2%: 77.5% strongly disagreed, 16.7% disagreed) that this was acceptable. Only 5.7% of the respondents agreed with the notion that taking prescription opioids for reasons other than intended use was acceptable. Additionally, the majority of respondents disagreed (88.9%: 66.8% strongly disagreed, 22.1% disagreed) that it was safer to get high on prescription opioid medications than illegal street drugs. This was largely supported by the fact that 91% of respondents indicated they ‘never’ took prescription opioids for reasons other than their intended use. ‘Rare’ use was endorsed 6.3% of the time, and 2.4% of the respondents indicated they ‘sometimes’ take prescription opioids for reasons other than intended use. Seventy-six of the respondents did not answer the questions related to taking prescription opioids for reasons other than their prescribed use. Assisting sleep habits was the main reason (78.9%) for taking prescription opioids for reasons other than their intended use. However, wanting to get high was also identified by 15.8% of the respondents. In regards to the question about reasoning behind using prescription opioids for reasons other than their intended use, respondents were instructed to choose all that apply; only 19 respondents answered this question. The low response rate can lead to a selection bias and increases the chance of assuming a false premise as true.

**Storage.** When looking at the storage of prescription opioids, 92% of respondents disagreed (67.6% strongly disagreed, 24.2% disagreed) with the notion that prescription medications should be accessible to everyone in the house. Only 6.3% of the respondents agreed with this notion while a small minority, 1.9%, strongly agreed. Despite these results, only 35.3%
of the respondents stored their medications in their private bathroom inside a medicine cabinet. Just under one-third (30.9%) of the respondents stored their prescription opioids in the kitchen, with 23.2% of respondents storing their medications in their private bedroom. Seventy-seven of the respondents did not answer the questions related to proper storage of prescription medications.

**Disposal.** Results to questions regarding proper disposal of opioid medications were less reassuring. Approximately two-thirds of the respondents (64.9%) indicated that it was ‘unacceptable’ to keep unused prescription opioids. Despite 41.7% of the respondents knowing the location of a disposal site, only 34.6% of them reportedly took their unused opioids to the disposal site. Other disposal methods involved respondents keeping unused medications (25.5%), throwing unused medications in the trash (18.8%), and flushing unused medications down the latrine (13.9%). Only 51.4% of the respondents reportedly took time to learn about proper disposal methods. Seventy-six of the respondents did not answer the questions related to opioid medications disposal.

**Discussion and Recommendations**

This study refuted the first proposed root cause, which expected that Montgomery County’s population had misperceptions about the risks of prescription opioid misuse. It also highlighted the fact that not all the respondents who acknowledged the risk engaged in preventive behaviors to reduce the risk. As such, multi-level prevention measures that adequately address behavior change will provide a greater impact to curbing the opioid epidemic versus one-dimensional measures that focus solely on consumer education (McCarthy et al., 2015; Kelly & Barker, 2016). This is not to say that education is unimportant to help sustain the strong perception of the risk of opioid misuse, education should continue throughout the
community. In the sections below, behavior and education recommendations are made on four general categories – personal use, sharing, storage, and disposal of opioid medications. Additionally, study limitations are discussed along with highlighting future areas of interest.

**Personal Use**

Survey results indicated that 91% of respondents understood that taking more than the prescribed dosage of an opioid medication was risky. Despite this high level of risk understanding, only 77% of respondents actually practiced the safe behavior of taking only the prescribed dose. The underlying reasons for taking excess medications were poor pain control and sleep disruption. Only 15.8% of respondents indicated excess use was related to getting high. Approaches to decreasing the unsafe behavior of not taking medications as prescribed should be based on improving the doctor/patient relationship. Increasing the access to care and allowing for more time to provide a comprehensive pain management plan would aid in developing a better doctor/patient relationship. Both of these actions would help eliminate treatment barriers such as “fear of uncontrolled pain and stigmatization of being treated alongside people with non-medical opioid use” (Stumbo, Yarborough, McCarty, Weisner, & Green, 2017, p. 47, Abstract-Conclusion). Additionally, addressing the emotional hardships related to chronic pain (i.e., catastrophizing, anxiety, depression) would also help decrease reliance on opioid medications (Martel, Wasan, Jamison, & Edwards, 2013).

**Sharing**

The same dichotomy existed in regards to giving or receiving opioid medications from family and friends. Approximately 88% of respondents knew that giving opioid medications to a family member or friend was risky, however, only 72% of the respondents actually engaged in the safe behavior of not giving opioid medications to their family or friends. Approximately
83% of respondents knew that receiving opioid medications from a family member or friend was risky, however, only 71% of the respondents actually engaged in the safe behavior of not accepting opioid medications from family or friends. Motivations leading to the respondent’s unsafe behavior were largely altruistic in origin. Whether giving or receiving, the respondents reported behavior was based on providing/obtaining pain relief; not on recreational use of opioid medications. Financial limitations were the main reason for poor pain control. Based on this information it would appear that providing improved financial support for obtaining prescribed medications might help reduce the risky behavior of sharing opioid medications amongst family and friends. As no literature was found to support this notion, further research is required.

**Storage**

Improper storage of prescribed opioid medications was a significant uncontrolled risk factor; this supports the second identified root cause of prescription opioid misuse in Montgomery County (Appendix A). Despite 92% of respondents disagreeing with the notion that prescription medications should be accessible to everyone, none of the respondents incorporated a secure storage method within their home. This is an area ripe for educational intervention as 5 to 11% of people who abuse prescription opioids steal them from a family member (Cicero et al., 2011). Community campaigns on proper storage techniques such as the National Family Partnership’s Lock Your Meds® campaign along with expanding opportunities to obtain prescription lock boxes should help curb this form of access to opioid medications (National Family Partnership, 2017). Furthermore, the vested interest theory (VIT) may prove useful for encouraging behavior that prevents prescription medication misuse (Donaldson, Siegel, & Crano, 2016).
Disposal

Improper disposal methods also presented an uncontrolled risk factor; this supports the second identified root cause. Despite 64.9% of respondents indicating it was unacceptable to keep unused prescription opioids, only 34.6% of them reportedly took their unused medications to a proper disposal site. Another 25% of the respondents simply kept the unused medication at home. Only 51.4% of the respondents took time to learn about proper disposal methods. In a survey looking at Americans’ views of opioid pain reliever abuse, improper storage and improper disposal were ranked as the second and third highest causes (65.1% and 64.1%, respectively) (Barry et al., 2016). Establishing a community campaign that addresses the hazards of keeping medications and highlighting medication disposal locations could help curtail the opioid epidemic. Similar to changing behaviors related to improper storage, the vested interest theory (VIT) shows potential in changing behaviors related to improper disposal methods.

Limitations

Study limitations included small sample size and small proportions of respondents answering specific questions both of which contribute to selection bias. Montgomery County has a population of 535,141 (United State Census Bureau, 2010); the sample size for this initial survey review is 284 respondents. Because of the small sample size, there’s a greater chance for assuming a false premise as true. This is especially likely for the four questions that looked at reasoning behind a respondent’s perceptions or actions: these questions often had only 60 to 70 respondent answers.

Selection bias is likely due to this survey being available in an online version only. In order to have access to a computer and be able to navigate web-based surveys, respondents will most likely have a higher socioeconomic class and education level. This was substantiated by
the fact that approximately 92% of the respondents had some form of college education and 76.7% of the respondents were gainfully employed. Potential avenues for increasing the number of respondents across the socioeconomic spectrum include creating a mobile phone version of the survey, having large agencies (i.e., Women, Infants, Children; Job and Family Services; etc.) send the survey link to their customer’s text numbers, or having hospitals create a link on their respective patients’ web-based sign in pages (Smith, 2017).

**Future Areas of Interest**

In light of these preliminary findings, engagement with community leaders should continue in order to have additional surveys completed by a wider scope of community members. Surveys that try to identify high-risk geographical areas would allow for a more concentrated education and intervention campaign against prescription opioid misuse. Lastly, assessing the impact of planned interventions with a second survey would allow for critical feedback on the success of any implemented programs.
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Appendix A: Logic model for the Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey

**Problem:**
There is a prescription drug misuse problem in Montgomery County

**Root Cause:**
- Prescription opioids are highly accessible.
- Sharing opioid prescriptions is safe.
- There is a lack of education within the general population regarding safe opioid medication use.

**Misperception:**
- Opioid prescriptions are safe and legal to get high on.
- Opioid prescriptions are stored properly within the home.

**Interventions:**
- Improve doctor/patient relationship
- Address emotional hardship related to chronic pain
- Improving financial support
- Education campaign on proper storage and disposal
- Better access to medication lock boxes
- Vested Interest Theory
Appendix B: Exemption status for survey conducted by the Montgomery County ADAMHS and the Montgomery County Prevention Coalition

Chart 4: Does Exemption 45 CFR 46.101(b)(2) or (b)(3) (for Tests, Surveys, Interviews, Public Behavior Observation) Apply?

From Chart 2

Does the research involve only** the use of educational tests, survey procedures, interview procedures, or observation of public behavior?

** "Only" means that no non-exempt activities are involved. Research that includes exempt and non-exempt activities is not exempt.

Does the research involve children to whom 45 CFR part 46, subpart D applies?

Does the information obtained recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and could any disclosure of the human subjects' responses outside the research reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation?

Research is not eligible for exemption under 45 CFR 46.101(b)(2).

However, the 45 CFR 46.101(b)(3) exemption might apply.

Are the human subjects elected or appointed public officials or candidates for public office? (Applies to senior officials, such as mayor or school superintendent, rather than a police officer or teacher.)

Does any Federal statute require without exception that the confidentiality of personally identifiable information will be maintained throughout the research and thereafter?

Research is eligible for exemption under 45 CFR 46.101(b)(3) from 45 CFR part 46 requirements.

Research is not eligible for exemption under 45 CFR 46.101(b)(2) or (b)(3).

Return to Chart 2 and consider whether 45 CFR 46.101(b)(4) exemption applies.
Appendix C: Decision chart indicated analysis of anonymous existing data is not covered by 45 CFR part 46.

Chart 1: Is an Activity Research Involving Human Subjects Covered by 45 CFR part 46?

- Start here.
- Is it research?
  - Yes: Is the activity a systematic investigation designed to develop or contribute to generalizable knowledge? [45 CFR 46.102(d)]
  - No: Activity is not research, so 45 CFR part 46 does not apply.

- Activity is research. Does the research involve human subjects?
  - Yes: Does the research involve obtaining information about living individuals? [45 CFR 46.102(f)(1)]
    - Yes: Is the information individually identifiable (i.e., the identity of the subject is or may readily be ascertained by the investigator or associated with the information)? [45 CFR 46.102(f)(2)]
    - No: The research is not research involving human subjects, and 45 CFR part 46 does not apply.
  - No: The research is not research involving human subjects, and 45 CFR part 46 does not apply.

- Does the research involve intervention or interaction with the individuals? [45 CFR 46.102(f)(1), (2)]
  - No: Activity is research involving human subjects. Is it covered by the regulations?
  - Yes: Is it conducted or supported by HHS? [45 CFR 46.101(a)(1)]
    - Yes: The research involving human subjects is covered by the regulations.
    - No: Does the institution hold an FWA under which it applies 45 CFR 46 to all of its human subjects research regardless of the source of support?
      - Yes: The research involving human subjects is covered by the regulations.
      - No: Go to Chart 2.

- The research is not research involving human subjects, and 45 CFR part 46 does not apply.

- Is the information private? (About behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, or provided for specific purposes by an individual and which the individual can reasonably expect will not be made public.) [45 CFR 46.102(f)(2)]
  - Yes: Unless exempt under 45 CFR 46.101(b), 45 CFR part 46, subpart A applies to the research, and as appropriate subparts B, C, and D also apply.
  - No: Other Federal, State and local laws and/or regulations may apply to the activity. [45 CFR 46.101(f)]
Appendix D: The Montgomery County Adult Risk Perception of Prescription Opioid Misuse Survey

Marijuana / Prescription Medication Survey – Adult

In order to effectively serve our community, the Alcohol, Drug, and Mental Health Services Board for Montgomery County and Public Health-Dayton and Montgomery County are partnering together to conduct a survey concerning your personal views on health. The information collected will help provide greater understanding of attitudes towards prescription medication and marijuana. The survey will take approximately five to seven minutes to complete.

Demographics

1. Do you live in Montgomery County?
   a) Yes
   b) No

2. What is your Zip Code? __________

3. What is your race? (Mark all that apply)
   a) African American
   b) Asian
   c) Caucasian
   d) Hispanic or Latino
   e) Middle Eastern
   f) Other not listed

4. What is your gender?
   a) Female
   b) Male

5. What is your age? __________

6. What is the highest level of education you have completed?
   a) Less than High School diploma or GED equivalent
   b) High School diploma or GED equivalent
   c) Some college; less than 1 year
   d) Some college; more than 1 year, no degree
   e) Professional Degree; no college
   f) Associate Degree
   g) Bachelor Degree
   h) Master Degree
   i) Doctorate Degree
7. What is your current employment status?
   a) Employed for wages
   b) Self-employed
   c) Out of work and looking for work
   d) Out of work and not currently looking for work
   e) Homemaker
   f) Student
   g) Retired
   h) Disabled
   i) Other (Please specify)

8. Do you currently work in Montgomery County, Ohio?
   a) Yes
   b) No

9. Do you currently go to school in Montgomery County?
   a) Yes
   b) No

**Marijuana Questions**

The first set of questions asks your opinions regarding YOUTH and marijuana. Youth are defined as anyone under the age of 21.

10. How easy is it for youth to get marijuana?
    a) Very easy
    b) Somewhat easy
    c) Somewhat difficult
    d) Very difficult
    e) Unsure

11. Where do you believe youth are getting marijuana? (Mark all that apply)
    a) Growing their own
    b) Friends
    c) Family Members
    d) Other Adults
    e) Other Youth
    f) Internet
    g) Unsure
    h) Other

12. How harmful do you think marijuana use is for youth?
    a) Very harmful
    b) Somewhat harmful
    c) Not at all harmful
    d) Unsure
13. How many of your friends think it is alright for youth to use marijuana?
   a) All of them
   b) Most of them
   c) A few of them
   d) None

14. How much do you think your friends approve or disapprove of the use of marijuana by youth?
   a) Strongly approve
   b) Approve
   c) Unsure
   d) Disapprove
   e) Strongly disapprove

*Answer the following questions about how severe you think the consequences ARE for youth who got caught using marijuana.*

15. How severe do you think the **legal** consequences are if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic

16. How severe do you think the **school** consequences are if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic

17. How severe do you think the **family** consequences are if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic

*Answer the following questions about how severe you think the consequences SHOULD BE for youth who got caught using marijuana.*

18. How severe do you think the **legal** consequences should be if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic
19. How severe do you think the **school** consequences should be if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic

20. How severe do you think the **family** consequences should be if a youth got caught using marijuana?
   a) No consequences
   b) Minor
   c) Moderate
   d) Major
   e) Catastrophic

21. Why do you think some youth choose to use marijuana? (Rank order)
   Please list your ranking on the line below (From 1 to 8; with a 1 meaning your # 1 reason for using)
   ______ Peer Pressure
   ______ Normalized in the popular media
   ______ Escape / coping
   ______ Boredom
   ______ Rebellion
   ______ To feel grown up
   ______ To fit in
   ______ Curiosity / experimentation

22. How easy is it for adults to get marijuana?
   a) Very easy
   b) Somewhat easy
   c) Somewhat difficult
   d) Very difficult
   e) Unsure

23. Where do you believe adults are getting marijuana? (Mark all that apply)
   a) Growing their own
   b) Friends
   c) Family Members
   d) Other Adults
   e) Other Youth
   f) Internet
   g) Unsure
   h) Other

24. How harmful do you think marijuana use is for adults?
   a) Very harmful
   b) Somewhat harmful
   c) Not at all harmful
   d) Unsure
25. How many of your friends think it is ok for adults to use marijuana?
   a) All of them
   b) Most of them
   c) A few of them
   d) None

26. How much do you think your friends approve or disapprove of the use of marijuana by adults?
   a) Strongly approve
   b) Approve
   c) Unsure
   d) Disapprove
   e) Strongly disapprove

27. Why do you think some adults choose to use marijuana? (Rank order)
   Please list your ranking on the line below (From 1 to 8; with a 1 meaning your # 1 reason for using)
   _____ For the effect of THC (delta-9-tetrahydrocannabinol), the main active chemical
   _____ Normalized in the popular media
   _____ To relax
   _____ Peer, family, role model influence
   _____ Low perception of harm
   _____ To relieve stress, anxiety, fear or anger
   _____ Spiritual reasons
   _____ Curiosity / experimentation

**Prescription Drug Questions**
*The final questions of the survey are in regards to YOUR views on prescription medication.*

28. It is acceptable to take more of my prescription medications than directed by my doctor when I need it.
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

29. I take more of my prescription medications than what is directed by my doctor.
   a) All the time
   b) Sometimes
   c) Rarely
   d) Never

30. I take more of my prescription medications because…choose all that apply
   a) I am in so much pain
   b) I like the way it makes me feel
   c) To help me sleep
   d) I do not think I was prescribed the proper dosage for my symptoms
   e) Other (please specify)
31. It is acceptable to share prescription medications with family and/or friends if they need it.
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

32. I share prescription medications with family and/or friends if they need it.
   a) All the time
   b) Sometimes
   c) Rarely
   d) Never

33. I share prescription medications with family and/or friends because… Choose all that apply.
   a) I have extra medication and they need it
   b) They asked me
   c) They like how it makes them feel
   d) They need help sleeping
   e) They couldn’t afford the medication
   f) They do not have insurance
   g) They have insurance but it doesn’t cover some of the prescription medications that they need
   h) Other (Please specify) _____________________________

34. It is acceptable to take prescription medications given to me by family and/or friends.
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

35. I take prescription medications given to me by family and/or friends.
   a) All the Time
   b) Sometimes
   c) Rarely
   d) Never

36. I take prescription medications given to me by family and/or friends because…Choose all that apply
   a) I don’t have time to go to the doctor
   b) I don’t have the money to go to the doctor
   c) I don’t have money to pay for a prescription
   d) I don’t have insurance
   e) They had medicine I need
   f) It helps me sleep
   g) I like the way it makes me feel
   h) I have insurance but it doesn’t cover some of the prescription medications that I need
   i) Other (Please specify) _____________________________

37. It is acceptable to take prescription medications for reasons other than their intended use (such as to feel good, to get high, to sleep, etc.).
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree
38. I take prescription medications for reasons other than their intended use (such as to feel good, to get high, to sleep, etc.).
   a) All the time
   b) Sometimes
   c) Rarely
   d) Never

39. I take prescription medications for reasons other than their intended use because…Choose all that apply:
   a) I like the way it makes me feel
   b) I need help sleeping
   c) I need help concentrating
   d) I don’t feel good when I don’t take them
   e) I need help for staying awake
   f) I want to get high
   g) Other (please specify)

40. It is safer to get high on prescription medications than illegal street drugs.
   a) Strongly Agree
   b) Agree
   c) Disagree
   d) Strongly Disagree

41. When I get rid of my prescription medications, I typically:
   a) Throw them in the trash can
   b) Flush them down the toilet
   c) Take them to a disposal site
   d) I do not get rid of my prescription medication – I keep them in case I need them again
   e) Other (Please specify): ____________________________

42. It is acceptable to keep unused prescription medication(s) that I know longer need to take.
   a) Yes
   b) No

43. I am aware of prescription medication disposal sites in my community.
   a) I am aware of at least one location
   b) I am aware they exist, but I am unsure of a specific location
   c) I am not aware of any in my community
   d) I do not know what a disposal site is

44. I take the time to read about how to properly dispose of prescription medication(s).
   a) Yes
   b) No

45. Where do you store the majority of your prescription medications?
   a) In my bathroom inside of a medicine cabinet
   b) In my bedroom next to my bed
   c) In my kitchen
   d) I do not have a specific place I store my prescription medication
   e) Other (Please specify): ____________________________
46. Should prescription medications be accessible to everyone in a household?
   a) Yes
   b) No
Appendix E: List of Competencies Met in CE

Wright State Program Public Health Competencies Checklist

<table>
<thead>
<tr>
<th>Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess and utilize quantitative and qualitative data.</td>
</tr>
<tr>
<td>Apply analytical reasoning and methods in data analysis to describe the health of a community.</td>
</tr>
<tr>
<td>Apply behavior theory and disease prevention models to develop community health promotion and intervention programs.</td>
</tr>
<tr>
<td>Communicate public health information to lay and/or professional audiences with linguistic and cultural sensitivity.</td>
</tr>
<tr>
<td>Make evidence-informed decisions in public health practice.</td>
</tr>
<tr>
<td>Evaluate and interpret evidence, including strengths, limitations, and practical implications.</td>
</tr>
<tr>
<td>Demonstrate ethical standards in research, data collection and management, data analysis, and communication.</td>
</tr>
</tbody>
</table>

Concentration Specific Competencies Checklist

<table>
<thead>
<tr>
<th>Emergency Preparedness:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicate and manage information related to an emergency</td>
</tr>
<tr>
<td>Demonstrate the mastery of the use of principles of crisis and risk management</td>
</tr>
<tr>
<td>Use research and/or evaluation science methodologies and instruments to collect, analyze and interpret quantitative and qualitative data</td>
</tr>
<tr>
<td>Employ ethical principles in the practice of public health emergency preparedness</td>
</tr>
</tbody>
</table>