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Research Article

Is Perception Reality? Identifying Community Health Needs When Perceptions of Health Do Not Align with Public Health and Clinical Data

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Abstract

Objectives: During a multi-year community health needs assessment process, we sought to prioritize the health needs of the community served by the Meadville Medical Center (Crawford County, PA) and meet the Affordable Care Act requirement for non-profit hospitals.

Methods: We collected community health perspective data through a voluntary in-person survey. Additionally, we collected data from the Meadville Medical Center Emergency Department and the PA Department of Health. Using qualitative methods we compared the datasets to prioritize community health needs.

Results: Both the perceptions and surveillance data show chronic diseases to be the priority health concern. There was a large perception that mental health is a need; however, surveillance data identified sexually transmitted infections and vaccine-preventable diseases as community health priorities.

Conclusions: Public health interventions, education programs, and further research are needed to address the community health needs that were prioritized. The mixed methodology approach we used to conduct our community health needs assessment can be utilized by other small, rural hospitals that need to complete a community health needs assessment to meet Affordable Care Act requirements.

Introduction

According to public health literature, a Community Health Needs Assessment (CHNA) is the process of using quantitative and qualitative methods to systematically collect and analyze data in order to understand the health status and needs of a defined population/community [1]. The Affordable Care Act (ACA) requires that all 501(c) (3) hospitals conduct a CHNA and adopt an implementation strategy to meet identified community health needs at least once every three years [2]. Non-profit hospitals that fail to meet the CHNA requirement of the ACA can be penalized through an excise tax issued by the Internal Revenue Service (IRS). These fines can be as high as $50,000 [2, 3].

The Meadville Medical Center (MMC) is a 249-bed non-profit community hospital located in northwestern Pennsylvania (Figure 1). The MMC in collaboration with local health services organizations and agencies began a multi-year CHNA project to meet the ACA requirements in 2013. The population served by the MMC includes the majority of residents in Crawford County, PA (~58,000 individuals). Crawford County is a rural community located 90 miles north of Pittsburgh, PA and 40 miles south of Erie, PA. Approximately 17% of the population in Crawford County lives below the poverty line; less than 20% of adults have completed a Bachelor's degree in spite of the fact that 87% have completed high school; nearly 18% of adults are senior citizens [4]. The city of Meadville, the Crawford County Seat, is home to approximately 13,000 residents as well as the MMC, Allegheny College, and city, county, and state governmental offices [5]. However, nearly a quarter (24.2%) of the city residents lives in poverty [4].

Although the ACA provides specific instructions about what to include in the CHNA process and reported documents, it provides little guidance about how a CHNA should be conducted. Our research team at Allegheny College [6] has been collaborating with the MMC to conduct a comprehensive CHNA during 2013-15.

The methodology we have developed for the CHNA includes three fundamental objectives:

(1) Developing community partnerships

(2) Developing a mixed methods research protocol and

(3) Disseminating valid and reliable results [7].

The foundation of our mixed methods protocol includes a review of public health surveillance data and an assessment of community perceptions of health [7]. Public health surveillance data - the systematic, ongoing collection, management, analysis, and dissemination of health data [8] - provides a preliminary understanding of the health of the community. Data that can be gathered through this research includes demographic characteristics, rates of reportable diseases, causes of death, and specific risk factors (i.e., environmental hazards, cigarette smoking, and illiteracy, among others) prevalent in the community [9-11]. An analysis of health surveillance data (commonly known as a secondary data analysis) illustrates what is known about the community and its health status. Gaps in the data and knowledge about community health can also be identified after a thorough review of the existing data.

Individual perceptions data are useful to researchers who want to know what individuals perceive to be the most common or pressing health need(s) in the community [9]. These perceptions of community health cannot be determined through an analysis of the public health surveillance data. A comparison of individual perceptions data to surveillance data is necessary to determine how community concerns about health align with reported rates of morbidity and mortality.

Our mixed method CHNA aims to identify health needs within the community and answer specific health-related questions such as if residents are receiving the proper cancer screening tests.

The objectives of our CHNA project were to:

1. Identify perceptions of community health from residents of the city of Meadville
2. Catalogue the community health status using emergency room admissions data from the MMC and public health surveillance data
3. Determine the similarities and differences between perceived and actual community health needs and
4. Prioritize community health needs.

Methods

In order to meet the goals of our CHNA project, three separate data analyses were conducted prior to a data comparison assessment. The community perceptions survey and emergency room admissions analysis discussed below were approved by the Institutional Review Board at Allegheny College.

Community Perceptions

A voluntary in-person survey was conducted during the summer of 2014 to gather information about health needs from community members. The survey was approved by the Allegheny College Institutional Review Board. The target population of the survey was adults (aged 18 and older) living in the geographic area served by the MMC. This includes the majority of Crawford County. The three-question survey was administered at three community locations: a weekend farmers' market; the county-wide senior citizens summer picnic; and the Meadville Area Food Pantry. Participants were recruited on a volunteer basis in-person by undergraduate research assistants. The research assistants provided assistance reading the survey questions to participants with low literacy.

The survey asked the following multiple choice questions:

(1) What do you think are the most important health issues in our community? (answer choices: chronic diseases, infectious diseases, occupational injuries, oral health, mental health, or other)

(2) What do you think are the most important risk factors impacting our community's health? (answer choices: education, obesity, poverty, substance abuse, tobacco use, or other) and

(3) Which of the following are the most important actions needed to improve our community's health? (answer choices: improvements and access to public facilities, increasing public safety, increasing the number of doctors and nurses, promoting healthy lifestyles, providing affordable health care, or other).

Demographic information, including age, zip code, and gender, was also collected from each participant.

Data collected through the survey was inputted into Microsoft Excel. Counts and frequencies of each answer were determined and stratified by the demographic information collected. We used chi-square goodness-of-fit tests to determine if the frequency of responses to each question were statistically significantly different (α =0.05).

Cataloguing Health Status

We used Emergency Room (ER) admissions data from the MMC to determine common reasons for using the emergency services at the hospital. Admissions records from the ER were acquired for the years 2011-2014. The review of ER admissions was approved by the Institutional Review Boards at both Allegheny College and the Meadville Medical Center prior to accessing the data. We reviewed the ICD-9 code for each admission logged between January 1, 2011 and December 31, 2014 and categorized each into one of eight categories: chronic diseases; infectious diseases; injuries; mental health; oral health; pain; women's health; and other/miscellaneous. We used chi-square goodness-of-fit tests to determine if the frequency of admissions in each of these eight categories were statistically significantly different (α =0.05). These categories were created by our research team and used to determine the most common reasons individuals used the ER. We assessed ER visits for the entire population and then stratified the results by age, gender, and payment method including type of insurance.

Comparing Perceptions and Health Status

We determined the leading causes of death in the city of Meadville and top 10 reportable diseases in Crawford County using data from the Pennsylvania Department of Health [13]. County data retrieved from the Department of Health was converted into rates per 10,000 individuals using Microsoft Excel. We used chi-square goodness-of-fit tests to determine if the frequency of mortality and morbidity rates were statistically significantly different (α =0.05).

Determining if Perception Is Reality

We conducted a qualitative comparison among the results from the perceptions survey, ER admissions analysis, and public health surveillance data from the Pennsylvania Department of Health. This qualitative analysis was conducted to determine the similarities and

Figure 1: Map of Meadville and Crawford County, PA. The geographic area served by the Meadville Medical Center includes most of western Crawford County.

differences between what community members perceive to be the most important health issues and associated risk factors with the reported diagnoses and causes of death in our community. Our rationale for making these comparisons was that a prioritized community health need must be an issue that is both identified through public health or clinical data and perceived to be an important issue among community members.

Results

We collected 206 perceptions surveys from community members 18 years of age and older. Of these participants, the majority (55.5%) lived in the same zip code as the MMC. The remaining participants included in our analysis lived in zip codes within the MMC's primary service area (Figure 1).

Participants who lived outside of the geographic area served by the hospital were removed from our analysis. Seventy percent of participants were female and the majority (89%) was greater than 26 years of age. Among the participants greater than 26 years old, 50% were senior citizens (greater than 65 years of age).

Sixty-eight percent of those completing the survey identified either chronic diseases (41%) or mental health (27%) as the most important health issue in our community. The proportion of individuals providing these responses were statistically significantly greater than the proportion of individuals selecting one of the other choices ($p<0.0001$). The most commonly perceived risk factors identified were obesity (29%), poverty (22%), and substance abuse (21%). There was no statistical difference between the frequency of responses ($p=0.45$). The majority of participants believe that either providing affordable health care (37%) or promoting healthy lifestyles (29%) are the most important actions needed to improve our community's health (Figure 2). The frequency of responses were statistically significantly different ($p=0.0026$).

In addition to collecting data about community health perceptions, we conducted an assessment of the Emergency Room (ER) admissions data at the MMC from 2011-2014. There were approximately 36,000 ER admissions annually at the MMC. The categorization of the ER admissions data showed that the most common reasons both men and women visit the MMC ER are for pain, such as headaches, back pain, and undiagnosed chest pain (29.5% of admissions); infectious diseases (27.8%), including illnesses such as influenza and sexually transmitted diseases; and injuries (20.9%). The frequency of admissions categorized were statistically significantly different ($p<0.0001$). Fifty-five percent of the ER patients were females; 45% males. Among the males, the most common category for ER admissions was infectious diseases and the percentage of men being admitted for injuries was 6% higher than women. Mental health issues were the fourth leading cause of ER admissions for both men and women (Table 1).

Admissions among children (ages 0-18 years of age) were primarily for infectious diseases (45% of admissions) and injuries (27%). Among the adult population (aged 19-64), the majority of ER

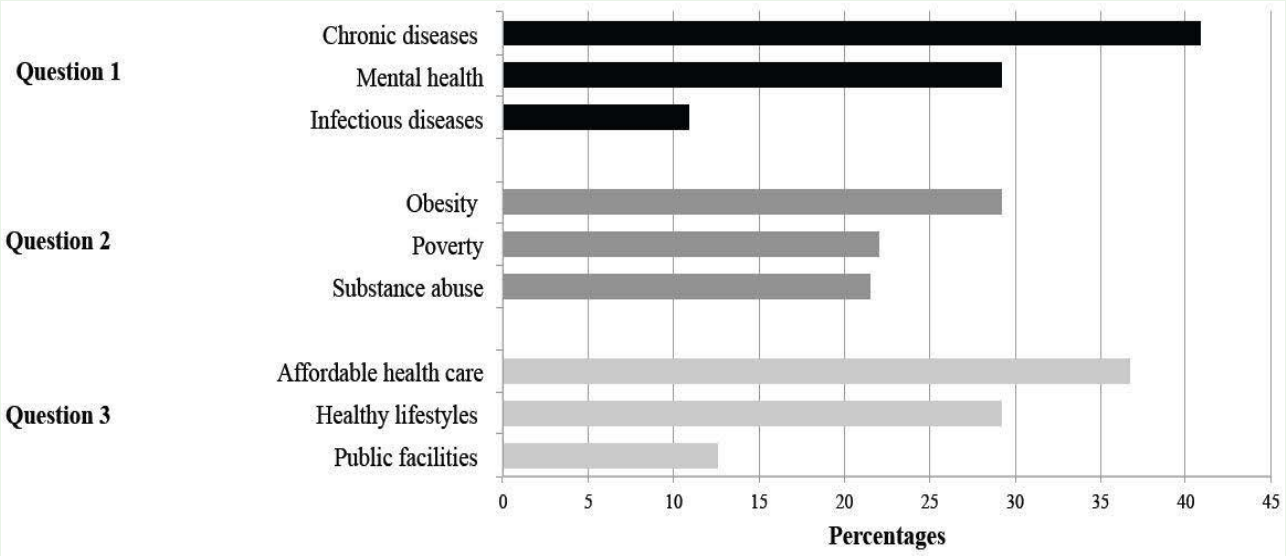

Figure 2: Perceptions of Community Health, Risk Factors, and Actions Needed to Improve Community Health.

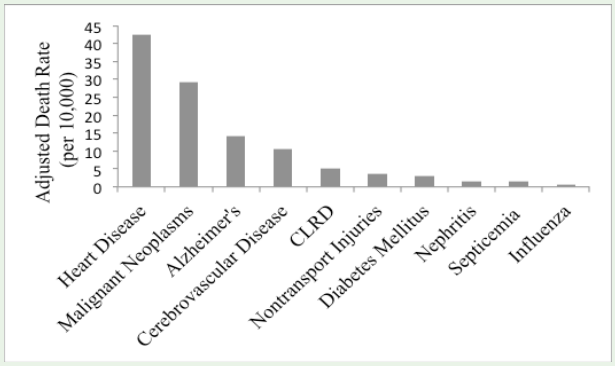

Figure 3: Leading Causes of Death in Meadville, PA (2013).

Table 1: Categorization of Emergency Room Admissions Data from the Meadville Medical Center, 2011-2014.

Diagnosis Category	Total Number of Admissions	Percent of Total Admissions
Pain	59,885	29.50%
Infectious Diseases	31,096	27.80%
Injury	23,370	20.90%
Other/ miscellaneous	10,035	9.00%
Mental health	5,498	4.90%
Oral health	4,359	3.90%
Chronic diseases	1,481	2.40%
Women's health	1,763	1.60%

admissions were for pain (34%), infectious diseases (21%), or injuries (21%). Among adults 65 years of age or older, 24% of ER admissions were for pain. Infectious diseases accounted for 24% of ER admissions followed by injuries (22%).

The majority (50%) of patients visiting the ER paid for their visit using some form of governmental health insurance, namely Medicare and Medicaid. Thirty-five percent of patients had private insurance; 10% were uninsured. Data from the Pennsylvania Department of Health show that the leading causes of death in the city of Meadville are primarily chronic diseases: heart disease, cancer, and stroke (Figure 3).

Two infectious diseases – influenza and septicemia – as well as non-transport injuries were also among the leading causes of death in Meadville. These rates are statistically significantly different ($p<0.0001$).

The most common reportable diseases in the Meadville community were grouped into three overarching categories: sexually transmitted diseases (Chlamydia and gonorrhea); vaccine-preventable diseases (Pertussis and Varicella); and cancer (breast, prostate, colon, and uterine). Campylobacteriosis and Giardiasis were also included in the list of top 10 reportable diseases in the Meadville community.

Discussion

As part of our multi-year CHNA project, we completed three separate data analyses – a community perspectives survey; analysis of ER admissions data; and a review of public health surveillance data – to compare the perceived and actual community health needs in Meadville, PA. The aim of this project was to identify and determine community health needs to both improve our community's health and meet the ACA requirements for non-profit hospitals. Our community perceptions survey showed that chronic diseases and mental health are of the greatest concern. Participants also believed obesity, poverty, and lack of affordable health care were important risk factors associated with community health needs (Figure 2). Data from ER admissions showed that the majority of health emergencies in the community can be attributed to pain, infectious diseases, and injuries (Table 1). Chronic diseases were the cause of the majority of deaths in our community (Figure 3) and sexually transmitted infections, cancers, and two vaccine-preventable diseases were the top reportable diseases in the Meadville community.

A comparison of the perceptions survey data and ER admissions shows that acute issues treated at the MMC ER are not perceived to be the most important community health issues. Only 11% of the survey participants identified infectious diseases as the leading community health concern (Figure 2); however, nearly a third of all ER admissions were for infectious diseases. The ER data show that chronic diseases, including cancer, are rarely treated in the hospital ER (only 2.4% of all admissions). The data also shows that the ER is rarely used by individuals seeking treatment for chronic diseases or mental health concerns (Table 1).

Unfortunately, the community perceptions survey did not ask if pain was considered to be a perceived health concern. Pain was the largest category of ER admissions, but cannot be compared to the survey data. We conducted the perceptions survey prior the analysis of the ER admissions data. Future studies of community health perceptions should include a question to determine if pain is considered a priority community health concern.

The fact that only 30% of patients admitted to the ER had private health insurance aligns with the perception that poverty is a leading risk factor for poor community health and that providing affordable health care would improve community health. We hypothesize that community member's associate access to affordable health care with having private health insurance. Additionally, poverty, along with the other two highest perceived risk factors, obesity and substance abuse, are each associated with increased rates of chronic diseases and mental health diagnoses [13-20].

Eight of the top 10 leading causes of death in the city of Meadville were chronic diseases. The finding that four of the top 10 reportable diseases were different types of cancers further supports and aligns with the perception that chronic diseases are a priority community health concern. However, the fact that two of the leading causes of death and six of the top 10 reportable diseases are infectious in nature illustrates that there is a disconnect between community members perceptions of health needs and what health data illustrates. It is unclear how community members determine what a community health need is. The data show that what individuals are seeking care for at the MMC ER is not associated with perceptions of community health.

Both the reportable diseases data and the ER admissions among children highlighted the high prevalence of infectious diseases in the community. In future studies determining the difference in perceived health concerns between adults with and without children should be a priority. We do not know if the adults completing our survey have

children or not. It is possible that we sampled a population without children. If we did oversample non-parents, it is possible that the perceptions of infectious diseases were missed because adults do not experience infectious diseases as often as children according to the ER admissions data (Table 1).

Mental health was perceived by 27% of the population surveyed to be a priority health concern. There was little data in either the ER admissions dataset or public health surveillance data about mental health. The lack of mental health services in Crawford County and the expense of counseling and mental health care could be the reasons. Mental health issues are not reported or treated in the Meadville area. Further studies are needed to determine if mental health issues are a real or perceived community health issue. We plan to explore other public health surveillance surveys with mental health data, such as the Health Interview Survey and Behavioral Risk Factor Surveillance System (BRFSS) in addition to conducting key informant interviews with local mental health service professionals and service providers. Meadville is also working to become a trauma-informed community [21] to identify and prevent health concerns associated with trauma.

Community Health Applications

We recognize that further inquiry is needed to prioritize and address the most important community health needs in Meadville. Although we used a mixed methods approach to identify and prioritize community health needs, our study had several limitations. First, we did not collect perceptions surveys from a sample population that was representative of the target population; rather we conducted a convenience sample. We attempted to survey a representative sample of volunteers by administering the survey at a mix of community events. Additionally, we limited our analysis of public health surveillance data to the leading causes of death and reportable diseases. Future work will include results from the Behavioral Risk Factor Surveillance Survey and the Pennsylvania Youth Survey.

Despite these limitations, our study highlights both the similarities and differences among perceptions of community health, ER use, and public health surveillance data. We have used the synthesis of this data to prioritize a set of preliminary community health needs. These needs include those where public health interventions or health services are needed; education can be enhanced; and further research is needed.

As seen in the public health surveillance data and perceptions survey, addressing and preventing chronic diseases is a community health need in Meadville. The number of cancer diagnoses and deaths are high and community members are concerned about cancer. Designing and implementing primary prevention programs focused on tobacco cessation, proper nutrition, and completion of the HPV vaccination series need to be priorities. Additionally, work to ensure that all community members have access and knowledge about cancer screening tests has been elevated to a top community health priority. As a result, the MMC is now offering annual lung cancer screening tests to current and former heavy smokers.

Public health education programs focused on preventing sexually transmitted and vaccine-preventable diseases are needed. Sex education, including how to prevent the transmission of sexually transmitted infections, must be made available across the lifespan starting with pre-teen youths and continuing through the geriatric population [22]. Similarly, health education programs focused on vaccine safety and the health consequences of vaccine-preventable diseases are needed. Influenza deaths as well as diagnoses of both Pertussis and Varicella could be decreased if rates of vaccination increased. Vaccine education programs targeted toward pregnant women and new mothers as well as the elderly are needed to increase vaccination rates.

Finally, future research is needed to design and implement effective and sustainable public health interventions and education programs to address the community health needs prioritized. Our future research plans include conducting a community health survey. This survey will collect data about individual health status and access to care, including preventative healthcare practices; physical activity; housing; health insurance; and barriers to leading a healthy lifestyle. We anticipate that the results of this survey will help us to specifically determine if poverty, obesity, and tobacco use are actually contributing to the community health needs. The survey specifically asks participants to list their personal barriers to leading a healthy lifestyle. With this information, we will be able to address the perceived action to improve community health and promote healthy lifestyles.

In conclusion, our work to compare community perceptions of health and data from both clinical and public health data sources was completed as part of the MMC's multi-year CHNA project. We conducted a qualitative data analysis of our three data sources and found that chronic diseases are both a perceived and actual community health need. Infectious diseases are prevalent throughout the community; however are not perceived to be a priority issue. Clinical and public health surveillance data do not provide evidence to support the perception that mental health is a priority community health need; therefore, further investigation of the clinical and public health data is needed. Moving forward this data provides a basis for future work focused on public health interventions, education, and additional research.

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