DETERMINING PERSONAL AND COMMUNITY PHYSICAL ACTIVITY DISPARITIES IN PIMA COUNTY USING THE AMERICAN FITNESS INDEX

by

Kevin T. Ralls

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As members of the Practice Inquiry Project Committee, we certify that we have read the practice inquiry project prepared by Kevin Ralls, titled “Determining Personal and Community Physical Activity Disparities in Pima County Using the American Fitness Index” and recommend that it be accepted as fulfilling the practice inquiry requirement for the Degree of Doctor of Nursing Practice.

____________________________________________________________ Date: April 21, 2014
Ruth Taylor-Piliae, PhD, RN, FAHA
Associate Professor with Tenure

____________________________________________________________ Date: April 21, 2014
Audrey Russell-Kibble, DNP, FNP-C
Clinical Assistant Professor

____________________________________________________________ Date: April 21, 2014
Kathleen May, PhD, RN, PHCNS-BC
Clinical Associate Professor

Final approval and acceptance of this practice inquiry is contingent upon the candidate’s submission of the final copies of the practice inquiry to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the practice inquiry requirement.

____________________________________________________________ Date: April 21, 2014
Practice Inquiry Project Director: Ruth Taylor-Piliae, PhD, RN, FAHA
Associate Professor with Tenure
STATEMENT BY AUTHOR

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SIGNED: Kevin T. Ralls, DNP candidate, FNP-C, MSN
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DEDICATION

I would like to dedicate this Practice Inquiry to my new wife, Chrisselda. Your love and support got me through the tough times and continues to inspire me everyday.
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ABSTRACT

Background. In Pima County, twenty-four percent of the population is obese, and this figure has steadily increased over the past ten years. A major cause is lack of regular exercise, which is a factor for other chronic health illnesses as well. An important intervention for improvement has been identified as regular, moderate-intensity physical activity. Proper surveillance is necessary to identify health disparities and barriers. The purpose of this scholarly practice inquiry (PI) was to use the American College of Sports Medicine American Fitness Index (ACSM-AFI) instrument to identify personal and community health disparities in Pima County, using the Global Strategy on Diet, Physical Activity and Health (DPAS) as a framework. Additionally, the purpose was to identify pertinent stakeholders who would benefit from these findings.

Methods. This was a descriptive cross-sectional study that used publicly available surveillance data. The analysis of the ACSM-AFI instrument results for Pima County, Arizona yielded personal health indicators, community/environment indicators, county advantages, and challenges in comparison to national averages, and identification of pertinent stakeholders. The sample population for this study was comprised of the residents of Pima County, Arizona as determined by publically available surveillance data.

Results. Pima County, compared to the national average, has a higher percent of moderately physically active residents, a lower percent of obese residents, more park-related expenditures, more swimming pools, more recreational centers, and more golf courses. Pima County has a lower percent of residents with health insurance, a higher death rate from diabetes and cardiovascular disease, lower parkland in city land area, a lower level of state requirements for
Physical Education classes, fewer primary care providers, fewer dog parks, baseball diamonds, acres of parkland, and more violent crime.

Conclusions. The major deficits, which should be the focus for community leaders, were health care coverage, cardiovascular and diabetes mortality, and environmental safety. These findings are relatable to obesity, metabolic syndrome, and socioeconomic barriers, which were identified in the initial literature review conducted for this PI. Examples of four major areas of pertinent stakeholders were the Pima County Health Department, the Pima County Business Community, the Arizona Daily Star, and The University of Arizona.
CHAPTER ONE – INTRODUCTION

Physical inactivity has been identified as the fourth leading risk factor for global mortality, causing an estimated 3.2 million deaths globally (World Health Organization, 2013). On average, Americans do not get an adequate amount of physical activity in their daily lives (CDC, 2012). Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure (WHO, 2013). The Centers for Disease Control and Prevention (CDC) states that less than half of all adults and only 3 out of 10 adolescents achieve an adequate amount of physical activity per the 2008 Physical Activity Guidelines (CDC, 2012). The benefits of physical activity are well-established. The CDC (2012) states that people who are physically active tend to live longer and have lower risks for chronic disease conditions such as heart disease, stroke, type 2 diabetes, and certain types of cancer.

Even though there are well-established benefits to physical activity, a large proportion of adults in the United States remain physically inactive, despite consistent evidence of the benefits of reduced chronic disease morbidity and mortality that regular physical activity confers (Shelton et al., 2011). Of the major chronic disease conditions that can occur, obesity and diabetes are among the most heavily influenced by physical activity (Bergouignan et al., 2009).

In the United States, approximately two thirds of adults are obese, which is defined as having a body mass index (BMI) equal to or greater than 30.0, or overweight, defined for adults as BMI of 25.0 to 29.9 (CDC, 2013). Additionally, one fifth of children are obese. A major underlying cause of this significant statistic is physical inactivity. Bergouignan and colleagues (2009) state that epidemiological data suggests that during the last few decades, energy intake and fat consumption have increased as physical activity has decreased. Reasons for inactivity
vary from poor physical health to lack of exercise resources. However, the growing trend of less physically active Americans is contributing to increases in co-morbidities, such as obesity (CDC, 2009a).

In the United States there are more than 20.9 million people who have been diagnosed as diabetic (CDC, 2013). This statistic has increased nearly 100 percent since 1998. This is a significant trend, because it is, in part, due to the national decline in healthy physical activity levels. Nedeltcheva, Kessler, Imperial, and Penev (2009) state that a sedentary lifestyle has emerged as the leading modifiable risk factor for type 2 diabetes. Therefore, the risk factors for diabetes are increased throughout a population that lacks of physical activity.

There are several barriers to having a physically active lifestyle, but surveillance and intervention at the community level are necessary in order to be successful at addressing the barriers (ACSM, 2013). A full assessment of a specific sample population must be conducted in order to identify individual and community health disparities. With these data, interest groups such as civic planners and policy makers can be made aware of the issues specific to their cities and towns. Synthesis of these data would identify negative health trends and improve planning for community interventions. By assessing physical activity at the community level instead of at the state or national level, community-specific interventions can be made, which would save the city planning bodies’ time and resources.

Physical Activity Guidelines

Children

The CDC (2012) states that children and adolescents should do 60 minutes or more of physical activity each day. This includes aerobic activity, muscle strengthening, and bone
strengthening. Examples of aerobic activity include either moderate-intensity aerobic activity, such as brisk walking; or vigorous-intensity activity, such as running at least three days per week (2012). Examples of muscle strengthening include gymnastics or push-ups, at least three days per week as part of the child's 60 or more minutes (2012). Examples of bone strengthening activities include jumping rope or running, which should be done at least 3 days per week as part of the child's 60 or more minutes (2012). For the purpose of this PI as outlined by the CDC (2012), the age group that defines children is from 6-17 years old.

Adults and Seniors

The CDC (2012) states that adults and seniors need at least:

(a) 150 minutes of moderate-intensity aerobic activity, i.e., brisk walking, every week and muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) or

(b) 75 minutes of vigorous-intensity aerobic activity, i.e., jogging or running, every week and muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms) or

(c) An equivalent mix of moderate- and vigorous-intensity aerobic activity and muscle-strengthening activities on two or more days a week that work all major muscle groups (legs, hips, back, abdomen, chest, shoulders, and arms).

Adults are defined as aged 18-64 years old. Seniors are defined as aged 65 years and older (CDC, 2012). The guidelines pertain to individuals who are generally in good health and can tolerate the recommended level of physical activity.

Background and Significance
National Data

In the United States, 48.8 percent of the population practice recommended levels of physical activity and 24.1 percent practice no leisure-time physical activity at all (CDC, 2009). Therefore, according to these data, almost one quarter of the national population engages in no physical activity whatsoever. The CDC (2013) states that more than one-third of U. S. adults (35.7%) are obese. Obesity-related conditions include heart disease, stroke, type 2 diabetes, and certain types of cancer. These illnesses are some of the leading causes of preventable deaths and increased annual medical costs, which were approximately $147 billion in 2008 (CDC, 2013). These conditions are all correlated with physical inactivity.

Pima County, Arizona

Pima County, Arizona has a population of 992,394 people and consists of Tucson, Marana, Oro Valley, Three Points, Green Valley, Sells, San Luis, Ajo, Pisinimo, and Arivaca (U.S Census Bureau, 2013). With regards to the assessment of Pima County, obesity, diabetes, and heart disease will be a major focus because of their direct relationship with physical inactivity.

The top ten causes of death in Pima County, Arizona, as identified by the Pima County Health Department (PCHD) (2012) are: (1) cardiovascular disease, (2) malignant neoplasms, (3) accidents or injuries, (4) chronic lower respiratory diseases, (5) cerebrovascular disease, (6) drug-induced deaths, (7) diabetes, (8) Alzheimer's disease, (9) intentional self-harm or suicide, and (10) injury by firearms. Of these top-ten causes of death, cardiovascular disease, cerebrovascular disease, diabetes, lower respiratory disease, colon cancer, and breast cancer are
all potentially preventable diseases that are influenced by the person’s physical activity level (PCHD, 2012).

According to the PCHD (2012), twenty-four percent of the population in Pima County are obese, which is defined as having a body mass index of 30 or greater. The average body mass index in Pima County has steadily increased over the past ten years (PCHD, 2012). The lack of regular exercise is a major factor in the increasing obesity rate, yet regular, moderate-intensity physical activity can reduce this risk along with many other chronic health conditions (PCHD, 2012; Bergouigan et al., 2009). The impact physical inactivity has on chronic illnesses was also reflected by Bergouignan and colleagues (2009) who stated that physical inactivity encourages obesity and diabetes.

When considering physical activity at the community level, it is important to assess the environment and available resources. In Pima County, residents have access to 10 fitness facilities per 100,000 people, which is lower than the national benchmark of 17 per 100,000 residents (PCHD, 2012).

**Conceptual Framework**

*Assessing Health in the Community*

The World Health Organization (WHO) framework (see Figure 1) for the implementation of the Global Strategy on Diet, Physical Activity and Health (DPAS) has been used to guide assessment of community health disparities in the past (WHO, 2006). A commonly accepted definition of health disparities is: “Differences in the incidence, prevalence, mortality, and burden of disease and often adverse health conditions that exist among specific population groups in the United States” (National Cancer Institute, 2010).
Figure 1 WHO DPAS Framework.

This framework was developed to address chronic illnesses world-wide such as cardiovascular diseases, obesity, diabetes, certain types of cancers, and respiratory illnesses. The WHO (2006) states that of all deaths due to a chronic illness, 80% will occur in low and middle income countries; and that inexpensive and cost-effective interventions such as adopting a physically active lifestyle can prevent the majority of these illnesses. The main focus on this framework regarding this PI was the monitoring, evaluation, and surveillance components.

The DPAS framework was designed to establish new or strengthen existing structures for implementing healthy lifestyles throughout diverse health sectors, for monitoring and evaluating
the DPAS framework effectiveness, and for guiding resource investment and management to reduce the prevalence of non-communicable diseases and the risks related to unhealthy diet and physical inactivity (WHO, 2006). The framework includes process, output, and outcome phases. In order to guide these stages, research must occur on which health disparities to approach first. Therefore, this framework serves as a measurable process with output indicators that permit accurate monitoring and evaluation of actions taken, in response to community-level health disparities (WHO, 2006).

Framework Components

*Monitoring and Evaluation of DPAS Implementation as Applied to this Study.*

According to the DPAS schematic model, ministries of health should provide leadership on physical activity through the development and implementation of supportive policies, programs, and environments (WHO, 2006).

While the DPAS framework was originally used to assist ministries of health, government agencies, and stakeholders in monitoring the progress of their actions to reduce non-infectious chronic illnesses (Sacks, Swinburn, & Lawrence 2009), it can still be used for a community level assessment. When using the DPAS, community level health disparities require investigation, so that policy makers and community leaders can work together to improve the situation (WHO, 2006). In addition, it is important to involve stakeholders (such as government health agencies, policy makers, city planners, the medical community, non-government organizations, and community representatives), when assessing community level health disparities (WHO, 2006).
The American College of Sports Medicine American Fitness Index (ACSM-AFI) (2013) was successfully designed as an assessment instrument that can identify community health disparities using government data such as the census. The ACSM-AFI enables stakeholders in communities to assess the level of physical activity and understand individual and societal behaviors related to physical activity (ACSM, 2013).

Problem Statement

In the United States, approximately two thirds of adults and one fifth of children are obese or overweight (CDC, 2009). These rates have increased dramatically, over the last thirty years, indicating that obesity has become a national epidemic. There are several factors contributing to this problem, including genetics, poor diet, and socioeconomics. However, a major factor that contributes to this issue is physical inactivity (CDC, 2012). Physical activity has steadily decreased among children and adults the past few decades (CDC, 2012). However, it is difficult to identify specific interventions that interest groups such as policy makers, city planners, community leaders, and health care entities can implement for improvement if applied to such a broad target (ACSM, 2013). The DPAS framework can be used to assess community health disparities related to participation in physical activity, increase communication among stakeholders, and identify community health areas that can be addressed through programs, policies, or interventions (PCHD, 2012).

The American College of Sports Medicine American Fitness Index (ACSM-AFI) is an assessment instrument that can determine the level of physical activity, and address individual and societal behaviors related to physical activity at the community level, thus identifying community health disparities (ACSM, 2013). The specific part of the DPAS framework that the
ACSM-AFI instrument pertains to is the *Indicators* section, which is part of *Monitoring, Evaluation, and Surveillance*. The WHO (2006) states that these indicators are identified as variables that help to measure changes and also facilitate the understanding of where we are, where we are going, and how far we are from the underlying goal.

The ACSM-AFI focuses on community-level surveillance using publicly available data and identifies health disparities specific to a community and its population (ACSM, 2013). The ACSM-AFI can be used continuously to evaluate implementations by stakeholders. Research, monitoring, evaluation, and surveillance should continue throughout the whole process to provide the public health department with feedback on the modifications needed (WHO, 2006).

The ACSM-AFI (2013) instrument was designed to analyze the health status of communities, focusing on preventative health behaviors, levels of chronic disease conditions, and access to health care. Focusing on physical activity at the community level is key, because of the impact that physical inactivity has on the general health of community residents.

The ACSM-AFI identifies community assets that support healthy lifestyles, such as support programs and local policies for physical activity (ACSM, 2013). What makes the ACSM-AFI unique from other instruments is that it captures the state of a community’s health and environmental resources and compares them to national averages (ACSM, 2013). The reason for conducting this study among communities or large metropolitan cities is because the solution to physical inactivity and obesity lies at the community level (ACSM, 2013). Applying the ACSM-AFI instrument to Pima County, Arizona: and utilizing data sources from local and national databases will provide key public health stakeholders current health and environmental disparities.
Metropolitan Statistical Area

The ACSM-AFI uses a Metropolitan Statistical Area (MSA) to define the area to study. The ACSM (2013) authors state that an MSA is a city core and its surrounding areas that act together as a unit in order to support the wellness of residents of the area. For this PI, Pima County was used. This is because defining one city by its limits overlooks the interaction of the surrounding suburban areas, which contain residents who need fitness-related resources as well (ACSM, 2013). Pima County was also chosen because major statistical data exist for Pima County in more detail than for the City of Tucson alone. Therefore, this analysis addressed the City of Tucson as well as the surrounding cities in Pima County.

Purpose

The purpose of this Scholarly Practice Inquiry was to use the American College of Sports Medicine American Fitness Index (ACSM-AFI) instrument to identify personal and community health disparities in Pima County, using the Global Strategy on Diet, Physical Activity and Health (DPAS) framework, to identify pertinent stakeholders who would benefit from these findings.

Aims

The following aims for this study, applied to Pima County, Arizona:

1. Conduct the ACSM-AFI assessment.
2. Compare personal health indicators with national averages.
3. Compare community/environmental health indicators with national averages.
4. Identify improvement priority areas.
5. Identify appropriate stakeholders.
Implications for Practice

Primary care providers are acutely aware of community health disparities and their role in the prevention of chronic illnesses in adults and children. There is a growing epidemic of childhood obesity in the United States, and the prevalence of obesity among children has more than tripled over the past 25 years (Boyle, Lawrence, Schwarte, Samuels, & McCarthy, 2009). This is an important population to focus on because at-risk children can be profiled early and interventions can be performed early before long-term clinical illness begins. Some of the problems that can occur among obese children and adults include type 2 diabetes, high blood pressure, and depression (Boyle, et al., 2009). Increasing physical activity would significantly reduce these risks.

Health disparities that are a consequence of physical inactivity are important to prevent because they carry expensive economic costs. Total health care costs related to obesity and overweight in adults was more than $100 billion dollars in 2004 (Boyle et al., 2009). Therefore, it is a benefit to our healthcare system to prevent diseases that occur from a lack of physical activity.

The promotion of physical activity within the community can be easily implemented by practitioners in a primary care role because health promotion and disease prevention occurs at this level. Prevention has become a key strategy in efforts to reduce the impact of obesity, and there is consensus that health care providers and health care institutions play a critical role (Boyle et al., 2009). Examples of successful prevention strategies include lifestyle-change counseling, which has been shown to help patients lose excess weight, be physically active, and maintain desired weight loss when conducted by primary care providers (2009).
Even though primary care providers are in an opportune role to promote physical activity, there are some barriers, which make this challenging. Health care systems often do not encourage their health care providers to engage in lifestyle-change counseling because of the lack of reimbursement or insurance coverage for visits to physicians, nurses, health educators, dietitians, and other health care providers for prevention or management of obesity (Boyle et al., 2009). Some common responses from the primary care community are that many health care providers have insufficient time during routine clinical visits to address obesity prevention and also have reported a lack of obesity-prevention services and resources to which they can refer patients (2009). Therefore, it is important to focus on physical activity disparity and its supporting data in order to have a strong base of evidence.

Definitions and Abbreviations

*Table 1 Definitions and Abbreviations.*

<table>
<thead>
<tr>
<th>Abbreviation/Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACSM-AFI</td>
<td>American College of Sports Medicine - American Fitness Index</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
</tr>
<tr>
<td>DPAS</td>
<td>Global Strategy on Diet, Physical Activity and Health</td>
</tr>
<tr>
<td>MSA</td>
<td>Metropolitan Statistical Area</td>
</tr>
<tr>
<td>PCHD</td>
<td>Pima County Health Department</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>Abbreviation/Term</td>
<td>Definition</td>
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<tr>
<td>------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Health disparities</td>
<td>Differences in the incidence, prevalence, mortality, and burden of disease and often adverse health conditions that exist among specific population groups in the United States” (National Cancer Institute, 2010).</td>
</tr>
<tr>
<td>Recommended physical activity</td>
<td>Moderate-intensity activities in a usual week (i.e. brisk walking, bicycling, vacuuming, gardening, or anything else that causes small increases in breathing or heart rate) for at least 30 minutes per day, at least 5 days per week; or vigorous-intensity activities in a usual week (i.e. running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate) for at least 20 minutes per day, at least 3 days per week or both. This can be accomplished through all types of physical activities (i.e. household, transportation, or leisure-time activities) (CDC, 2010).</td>
</tr>
<tr>
<td>Physical Inactivity</td>
<td>Less than 10 minutes total per week of moderate or vigorous-intensity physical activities (i.e. household, transportation, or leisure-time activity) (CDC, 2010).</td>
</tr>
</tbody>
</table>
Physical inactivity greatly contributes to the poor health of all Americans, including residents living in Pima County, Arizona. Major illnesses such as obesity, diabetes, and heart disease can be prevented or significantly reduced with regular physical activity. The need to reduce physical inactivity at the community level is evident (Pima County Health Department, 2012). However, a more detailed assessment of community health disparities is needed to capture both personal and environmental indicators contributing to a physically inactive lifestyle.

Using the DPAS framework, the ACSM-AFI fitness index was identified as an effective assessment instrument to identify community health disparities. Results can then be communicated to the appropriate stakeholders and policy makers to improve the overall health of the community.
CHAPTER TWO - REVIEW OF THE LITERATURE

Physical inactivity has many negative effects on overall health. Participation in physical activity is influenced by indicators of personal health and environmental resources. Assessment of personal and environmental indicators is needed for understanding potential health disparities at the community level.

Literature Search

An electronic search of several databases was performed using the MEDLINE-PubMed, EBSCO Host SPORTDiscus, and OVID-CINAHL through The University of Arizona Health Sciences Library (AHSL). The keywords “physical activity” AND “disparities” AND “community” were used to find relevant full text articles published in the past five years, in the English language, among humans. Additional limits included clinical trials and meta-analyses. This yielded a total of 50 articles for review. A total of 38 articles were discarded due to non-relevance to the topic of physical activity. An additional 3 articles were retrieved using the ancestry method, resulting in a total of 15 articles for review (see Table 3 Review of Literature for Physical Activity Disparities in a Community Setting).

Literature Review

Among the articles reviewed (N=15), there were five randomized control trials (RCTs) (Wang et al., 2012; Timmerman et al., 2012; Nedeltcheva, Kessler, Imperial, & Penev, 2009; Bergouignan et al., 2009; Zoellner et al., 2013), two quasi-experimental studies (Zoellner et al., 2011; Mier et al., 2011), one longitudinal cohort study (Sun et al, 2012), one prospective cohort study (Cohen et al, 2013), four cross-sectional studies (Grieser et al., 2008; Laska, Pasch, Lust, Story, & Ehlinger, 2011; Shelton et al., 2011; Hageman, Pullen, Hertzog, Boekner, & Walker,
A large number of African-Americans were evident in at least three study samples, which comprised the majority of the study samples (Griffith et al., 2011; Zoellner et al., 2013; Zoellner et al., 2011). There were three studies that had women-only samples (Bergouignan et al., 2009; Mier et al., 2011; Hageman et al., 2012). The average age range for all of the samples were between 30-50 years old. During the review of the literature, there were some emerging themes that began to form a pattern, including obesity, metabolic syndrome, and socioeconomic barriers.

**Literature Synthesis**

There are some consistent findings among the literature reviewed, which support the need to focus on physical inactivity regarding community health assessment. A common theme was the correlation between physical inactivity and obesity, metabolic syndrome, and socioeconomic barriers. See Table 3 Review of Literature for Physical Activity Disparities in a Community Setting

**Obesity**

Several studies conducted showed the correlation between physical inactivity and the prevalence of obesity. Randomized clinical trials (RCTs) \(N=2\), quasi-experimental \(N=1\), prospective cohort study \(N=1\), cross-sectional \(N=3\), and qualitative \(N=1\) study designs were used to identify the increased risk of obesity in physically inactive sample populations (Bergouignan et al., 2009; Zoellner et al., 2013; Mier et al., 2011; Cohen et al., 2013; Grieser et al., 2008; Laska et al., 2010; Hageman et al., 2012; Boyle et al., 2009). The majority of the studies were conducted among healthy older male and female adults. Sample populations
included large percentages of African-Americans even though only one study was performed with an exclusively African-American sample (Griffith et al., 2011).

In more than one study, evidence of the impact of physical activity on obesity was indicated by reductions in BMI as well as overall weight loss when physical activity was present (Grieser et al., 2008; Hageman et al., 2012; Laska et al., 2010; Zoellner et al, 2013). Another finding was that waist circumference, a marker of abdominal adiposity, was reduced on most participants in at least one study (Zoellner et al., 2013). BMIs as well as poor weight control due to physical inactivity occurred amongst young adults in both 2-year and 4-year colleges (Laska et al., 2010). Poor diet was also acknowledged as a factor in several studies Bergouignan et al., 2009; Laska et al., 2010; Boyle et al., 2009), but physical activity was discussed as the most significant factor.

Physical inactivity increases fat storage within the muscles, therefore leading to an increased tendency to become obese (Bergouignan et al., 2009). Even though the sample population in this particular study was mainly women, it is significant considering that they were all initially lean in body type. The effect of increased fat storage may be elevated in those who are already overweight and at risk (2009).

Large populations exist that spend a majority of daily time in a sedentary state, and only one-fourth of the national population followed 2008 physical activity guidelines, per the CDC (Cohen et al., 2013). The sample used by the Cohen et al. (2013) was localized to the southeastern U. S., but the correlation between the majority of the participants being sedentary and obese is significant (Bergouignan et al., 2009; Mier et al., 2011; Cohen et al., 2013).

Metabolic Syndrome
Another theme associated with physical inactivity is metabolic syndrome. Based on review of the literature, RCTs (N=3) and quasi-experimental (N=1) studies concluded that there is an increased risk of metabolic syndrome amongst those who do not participate in a sufficient amount of physical inactivity (Nedeltcheva et al., 2009; Timmerman et al., 2012; Wang et al., 2012; Zoellner et al., 2013).

Furthermore, regular physical activity reduces other factors such as high blood pressure, which also reduces the risk of being diagnosed with metabolic syndrome (Zoellner et al., 2011). Samples of the literature reviewed included mostly middle-aged and elderly, black and white females. (Griffith et al., 2011; Shelton et al., 2011; Wang et al., 2012; Zoellner et al., 2011; Zoellner et al., 2013)

The National Heart, Lung, and Blood Institute defines metabolic syndrome as a group of risk factors that raises risk for heart disease and other health problems, such as diabetes and stroke (Zoellner et al., 2011). There are five conditions that are considered risk factors for metabolic syndrome: A large waistline, high triglycerides, low HDL cholesterol, high blood pressure, and high fasting blood sugar (2011). Development of insulin resistance is a precursor to diabetes, which is why the findings of the literature reviewed for this scholarly PI were important.

Indicators for metabolic syndrome risk in the reviewed studies were physical inactivity, insulin resistance, poor insulin signaling, and poor nutrition (Zoellner et al., 2011). Physical inactivity has been correlated with an increase in metabolic syndrome diagnosis and is becoming more common due to a rise in obesity rates among adults (Zoellner et al., 2011). Sedentary lifestyles in combination with short sleep times facilitated an increased development of insulin
resistance and reduced glucose tolerance (Nedeltcheva et al., 2009). Aerobic exercise increases the effect of nutrient intake in older adults, which ultimately improves insulin signaling (Timmerman et al., 2012). Also higher levels of physical activity lowered the odds of metabolic syndrome (Hageman et al., 2012). This lowered risk was because the more physical exercise the participants engaged in, the more their BMI would improve.

There was a significant decrease in primary blood pressures in those who went from a sedentary lifestyle to a regular exercise regimen (Zoellner et al., 2011). This is significant because one of the major risk factors for metabolic syndrome is high blood pressure (Zoellner et al., 2011). Therefore, engaging in regular physical activity can help prevent high blood pressure and reduce the risk of metabolic syndrome by limiting this risk factor.

Research findings from these studies strongly support the importance of physical activity in helping to prevent metabolic syndrome. Those who have a sedentary lifestyle are more likely to be diagnosed with metabolic syndrome as well as become obese.

*Socioeconomic Barriers*

After reviewing the literature, some socioeconomic barriers to regular physical activity became apparent. Longitudinal cohort study ($N=1$), cross-sectional ($N=1$), and qualitative ($N=1$) study designs were used to identify the common socioeconomic barriers experienced by physically inactive samples. The most common conclusions were the lack of prioritization within the low-income family and neighborhood safety (Shelton et al., 2011; Griffith et al., 2011; Sun et al., 2012). The majority of studies were conducted among healthy older male and female adults.

Social factors should be considered when determinants of physical activity are studied,
and physical activity interventions among lower-income populations should address multiple levels, including the social network level and other aspects of social context (Shelton et al., 2011). Also, social networks and role-related conflicting demands of the residents must be considered (Shelton et al., 2011).

A major barrier to regular physical activity among the elderly is the safety of the neighborhood (Sun et al., 2012). The results were particular to the elderly population because this was the majority of one study sample (Sun et al., 2012). However, the overall conclusion was that the safety of the neighborhood significantly affects the physical activity level of its residents.

Other barriers to achieving an adequate amount of physical activity were work, family, and community priorities, which limited time and motivation for engaging in physical activity (Griffith et al., 2011). Physical activity is not considered a normative individual or social activity, which contributes to men prioritizing work and family responsibilities over physical activity (Griffith et al., 2011). This mostly affects low-income families because of this busy provider role, which can have increased or atypical work hours. There are other issues affecting those who are low-income and/or occupy a role within the family where they are highly involved (Shelton et al., 2011). These individuals may deprioritize physical activity in their lives because they are already focused on being providers for their families and cannot foresee any free time to include physical activity.

Summary

Within the literature reviewed, there are some consistent findings among the studies that support the need to focus on physical inactivity. A common theme was the correlation between
physical activity and obesity, metabolic syndrome, and socioeconomic barriers. Several studies conducted showed the correlation between physical inactivity and the prevalence of obesity. The main indicator in most of the studies was BMI. The majority of the reviewed studies supported the conclusion that physical inactivity is correlated with obesity.

The second finding in the literature was the correlation between physical inactivity and metabolic syndrome. The majority of the literature showed that there is an increased risk of metabolic syndrome amongst those who do not participate in a sufficient amount of physical inactivity.

The third conclusion was that there are significant socioeconomic barriers to maintaining adequate physical activity levels. The barriers are mainly a lack of neighborhood safety and the lack of prioritization within the low-income family. Neighborhood safety is important because if the residents do not feel safe going out of their homes to exercise, then they are more likely to remain indoors and adopt more if a sedentary lifestyle. Also those who have demanding roles within the family are more likely to disregard regular physical activity as a priority.

Therefore, the literature supports that physical inactivity is a major indicator of specific health disparities discussed. It can be concluded that assessing physical activity within a community should be a priority, due to the impact that it has on the overall health of the individual.
CHAPTER THREE – METHODS

The aims of this PI were to implement the ACSM-AFI assessment for Pima County, compare personal and community/environmental health indicators to the national averages, and identify improvement priority areas and appropriate stakeholders. One of the instruments that exist in the realm of physical activity assessment at both the personal and community levels is the American College of Sports Medicine American Fitness Index (ACSM-AFI) Instrument. A general overview of the ACSM-AFI methodology, along with its application to Pima County will be presented.

Design

This PI was a descriptive cross-sectional study, which used publicly available surveillance data. The purpose of a descriptive study is to observe, describe, and document aspects of a situation as it naturally occurs and sometimes to serve as a starting point for hypothesis generation or theory development (Polit & Beck, 2008). The analysis yielded personal health indicators, community/environment indicators, county challenges and advantages in comparison to national averages, and resources to focus health promotion efforts (ACSM, 2013).

Sample and Setting

The sample for this study was residents of Pima County, Arizona using publically available personal health indicators and community/environmental resources. The setting was Pima County. Pima County was chosen instead of the City of Tucson due to the limited statistical data on the city of Tucson and the extension of most data beyond Tucson city limits. The ACSM (2013) states that defining a “city” by its city limits overlooks the interaction
between the core of the city and the surrounding suburban areas. Residents outside the city limits have access to fitness-related resources in their suburban area as well as the city core; likewise, the residents within the city limits may access resources in the surrounding areas (ACSM, 2013). Pima County, Arizona was considered the MSA for this study. One of the major cities located within this MSA is Tucson. The inclusion of all of Pima County was necessary because the goal of this analysis was to obtain data that will improve the health and wellness of the entire community. There were no exclusion criteria based on gender, age, race, or socioeconomic situation, because the databases had already surveyed the entire sample population.

Limitations, including missing data, were left out of the analysis. The ACSM-AFI (ACSM, 2011) authors state that data were missing for most of the community/environmental indicators for eight metropolitan areas in their initial AFI analysis. They addressed this limitation by not calculating a score for the community/environmental component of the affected MSA (ACSM, 2013).

No specific criteria exist in order for a sample to be eligible for ACSM-AFI instrument analysis. The MSA needs to have enough public data collected on it to run the analysis. The nationally available data needed to measure these characteristics and resources are not available to allow comparisons of all of the smaller geographical levels in the MSAs, however, it would be possible for communities within the MSA to collect local data using the measurements and strategy outlined in this report to identify opportunities and to monitor improvements occurring as a result of their initiatives (ACSM, 2011).

Protection of Human Subjects
This PI did not meet the requirement to be considered human subjects research. Data collected came from already established public records. No individual names or disclosure of private information occurred. See Appendix A: Human Research Form.

Data Elements Criteria

The ACSM-AFI (2013) authors state that elements necessary in order to be included in the data index must have met the following criteria:

- “Be related to the level of health status and/or physical activity for a community” (p. 1)
- “Have recently been measured and reported by a well-respected agency or organization at the metropolitan area” (p. 1)
- “Be available to the public” (p. 1)
- “Be measured routinely and provided in a timely fashion” (p. 1)
- “Be modifiable through community effort” (p. 1)

Publically available census-type data exists from several organizations, which fulfill these criteria for Pima County, Arizona.

Study Measure

American Fitness Index Instrument

The American College of Sports Medicine American Fitness Index (ACSM-AFI) is an assessment instrument that analyzes publicly available community data to identify the condition of preventative health behaviors, levels of chronic disease conditions, and access to health care (ACSM, 2013). This instrument specifically focuses on physical fitness and community assets, such as physical activity policy and community support. This instrument was created due to an ACSM-commissioned Omnibus survey in 2007, which concluded that the solution to obesity and
sedentary lifestyles lies at the local community level (ACSM, 2013). In the original omnibus survey sample, 72 percent rated the community’s efforts to promote physical activity as average or worse, and 95% of participants acknowledged that physical activity was key for disease prevention (ACSM, 2013).

The ACSM-AFI instrument was developed through a Delphi Method–type scoring system, which was used to reach a consensus on whether each item should be in the AFI the weight it should carry (ACSM, 2013). A weight of 0.5 was assigned to elements that were considered to be of little importance; 1.0 for those items considered to be of moderate importance; and 1.5 to those elements considered of high importance to include in the data index (ACSM, 2013).

From this process, 30 indicators (see Table 4 Population Characteristics in Pima County Compared to the U. S. National Data, Table 5 Personal Health Indicators in Pima County Compared to the U. S. National Data, Table 6 Community and Environmental Indicators in Pima County Compared to the U. S. National Data, Table 7 School Health Policy in Pima County Compared to the U. S. National Data) were identified and weighted for the index; and 17 other descriptive variables were selected (ACSM, 2013). Each item was first ranked (worse value = 1) and then multiplied by the weight assigned by consensus of the ACSM expert panel (ACSM, 2013). The weighted ranks were then summed up by the indicator group to create scores for the personal health indicators and the community/environment indicators (ACSM, 2013). Finally, the Metropolitan Statistical Areas (MSA) scores were standardized to a scale with the upper limit of 100, by dividing the MSA score by the maximum possible value and multiplying by 100 (ACSM, 2013).
The following formula summarizes the scoring process: \( r = \text{MSA rank on indicator}, \ w = \text{weight assigned to indicator}, \ k = \text{indicator group}, \ n = 11 \text{ for personal health indicators}, \ n=15 \text{ for community/environmental indicators}, \) and \( n=1 \text{ for health care provider indicators} \) (ACSM, 2013). The MSA Scoremax is a hypothetical score, if an MSA ranked best on each of the elements. The individual weights are averaged for both indicator groups to create the total score (ACSM, 2013).

**Procedures**

The ACSM-AFI data were obtained from public records such as the U. S. Census and the U. S. Department of Agriculture (see Table 2 Data Collection Sources). The ACSM-AFI identifies areas of excellence, areas for improvement, and personal health and community/environmental health indicators (ACSM, 2013). These data are then entered into tables (see Table 4 Population Characteristics in Pima County Compared to the U. S. National Data, Table 5 Personal Health Indicators in Pima County Compared to the U. S. National Data, Table 6 Community and Environmental Indicators in Pima County Compared to the U. S. National Data, Table 7 School Health Policy in Pima County Compared to the U. S. National Data) and a profile of personal health indicators and community/environmental resources is produced as numbers and percentages. These data are then compared to neighboring communities or national averages. After identifying community health disparities, these results are intended to be communicated to key local stakeholders who would have the resources to implement changes.

The first step in the ACSM-AFI was to describe the community. This began by determining 17 different population characteristics. Population characteristics (ACSM, 2013) include age, gender, education level, ethnicity, employment, household income, crime and
disability rates within the community (see Table 4 Population Characteristics in Pima County Compared to the U. S. National Data). Primary data sources included the HRSA Health Resources County Comparison Tool.

The second step was to search for Personal Health Indicators (e.g., Health Behaviors, Chronic Health Problems, and Health Care), using data obtained from the national Behavioral Risk Factor Surveillance System (BRFSS) survey (CDC, 2013). See Table 5 Personal Health Indicators in Pima County Compared to the U. S. National Data. The death rates for cardiovascular disease and diabetes were obtained through the Centers for Disease Control and Prevention WONDER database (ACSM, 2013). Information on mortality rates for Pima County are in the PCHD (2012) databases. The number of primary care providers per 100,000, is available through the HRSA Area Resource File and through the County Health Ranking (2013). Health Behaviors (ACSM, 2013) include information on the amount of physical activity, fruit and vegetable intake, smoking behavior, and chronic health problems (ACSM, 2013) including obesity and diabetes data, and perceived physical and mental health.

The third step was to identify community and environmental indicators. See Table 6 Community and Environmental Indicators in Pima County Compared to the U. S. National Data. This process mainly identifies physical fitness resources and facilities. The ACSM (2013) defines recreational facilities as establishments primarily engaged in operating fitness and recreational sports facilities, featuring exercise and other active physical fitness conditioning, or recreational sports activities such as swimming, skating, or racquet sports. All data for recreational facilities, as well as measures of parkland, come from a report prepared annually by
The Trust for Public Land, called City Park Facts and in the County Health Rankings (ACSM, 2013). Additional data are also available from Pima County.

To determine access to healthy food choices, data were collected from the U. S. Department of Agriculture Farmers Markets and the County Health Rankings. Data pertaining to the use of public transportation to work and the percent biking or walking to work are available through the U. S. Census American Community Survey and the County Health Rankings (ACSM, 2013). Built Environment (ACSM, 2013) data include available parklands, farmer’s markets, and public transportation usage.

The fourth step was to identify health policies regarding physical education in schools. See Table 7 School Health Policy in Pima County Compared to the U. S. National Data. The indicator that identifies the level of state requirement for Physical Education (P.E.) classes (high school, middle school, and elementary school) is obtained from the School Health Policies and Programs Study (ACSM, 2013). The most recent version of these data is from 2012. Each state is assigned a number 1, 2, or 3 to indicate whether PE is required at the elementary, middle, and/or high school levels (2013).

The fifth step was to assess the physical fitness advantages and challenges relative to Pima County, Arizona. This was a comparison of data between Pima County and the national average for each category. The purpose of this comparison is to gain a relative sense of how well Pima County is doing compared to others, and to help stakeholders determine priorities for action (ACSM, 2013). However, the ACSM (2013) states that this comparison is not designed to determine statistically significant differences or to calculate scores or ranking. Advantages are areas where a community’s value is better than most or all comparison communities (ACSM,
Challenges exist if a community’s value is worse than most or all comparison communities (ACSM, 2013). It is also important to observe the degree of difference so that priorities for action can be taken.

This output identifies potential targets for implementing initiatives to improve these measures, which would improve the overall health, fitness, and quality of life of the residents of a community (ACSM, 2013). It is important to use these determinants for further communications with stakeholders. It is important to discuss among stakeholders to learn more about the community context and prioritize where physical fitness interventions are needed first.

The sixth and final step was to use the AFI to advocate for improved physical fitness. The purpose of completing the ACSM-AFI instrument is to help community stakeholders better understand the community’s physical activity level and health status and to help guide strategic planning activities (ACSM, 2013). The ACSM includes a Consult the AFI Community Action Guide, which has tools and resources to focus local health promotion efforts (ACSM, 2013). The Guide provides details on how to determine and communicate with relevant stakeholders in Pima County, Arizona who would benefit from the data and be able to facilitate the resources to promote physical fitness interventions.

Data Collection Sources

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<tr>
<th>Data Source</th>
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<tr>
<td>School Health Policies and Programs Study</td>
<td><a href="http://www.cdc.gov/shpps/">www.cdc.gov/shpps/</a></td>
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</table>

Data Analysis Plan

(1) Conduct the ACSM-AFI assessment.

This aim was met by inputting all of the necessary data into the ACSM-AFI. This was mostly done in percentages, which is how the data are represented.

(2) Compare personal health indicators with national averages.

This aim was met by comparing the percentages of required data between Pima County and the national average percentages.

(3) Compare community/environmental health indicators with the national averages.
This aim was met by comparing the percentages of required data between Pima County and the national average percentages.

(4) Identify improvement priority areas.

Areas for improvement are a product of the ACSM-AFI. This output is mostly described in percentages.

(5) Identify appropriate stakeholders.

These data were obtained by using names and organizations to be identified following the ACSM-AFI Community Action Guide.

Summary

Great detail is needed when discussing the ACSM-AFI instrument and how it was applied to the PI objectives. The ACSM-AFI instrument and its methodology was discussed, as well as how to apply it to Pima County, Arizona. The steps for conducting the ACSM-AFI were also discussed and included the identification of personal health indicators, community/environmental indicators, school health policy, identification of community advantages and challenges, and resources to help identify the appropriate stakeholders in the county. The application of the instrument yielded personal and community health disparity data relative to physical activity, which identifies the most significant areas where change is needed.
CHAPTER FOUR – RESULTS

The aims of this PI were addressed using the ACSM-AFI instrument to assess personal and community health disparities. Directions and implementation of the ACSM-AFI were obtained from the My AFI Community Application Instrument instructions (ACSM, 2013). Further analysis was done according to the ACSM-AFI instructions on the My AFI website (ACSM, 2013). A descriptive study using publicly available surveillance data was conducted. The analysis yielded personal health indicators, community/environment indicators, Pima County challenges and advantages in comparison to national averages, and resources to focus health promotion efforts.

Sample and Setting

Publically available personal health indicators and community/environmental data resources for Pima County, Arizona served as the sample population for this study. The setting was Pima County. There were no exclusion criteria based on gender, age, race, or socioeconomic situation, because the databases had already surveyed the entire sample population.

Implementing The ACSM American Fitness Index Instrument

The ACSM-AFI was implemented using the ACSM My Community Application Tool Instructions, which were located on the ACSM-AFI website (ACSM, 2013). Instructions were followed regarding data implementation and comparison for analysis (see Figure 2 American Fitness Index Pima County MSA Description, Figure 3 American Fitness Index Output Notable Result for Pima County, Figure 4 American Fitness Index Output Components for Pima County). Advantages and challenges were determined based on ACSM-AFI recommendations for
positive/negative trends as defined by $\geq 2.5\%$ difference in percentages or $\geq 20\%$ difference in numerical values when comparing the two data groups (ACSM, 2013). The format of the output was modeled after the ACSM-AFI 2013 Health and Community Fitness Status report of the 50 largest MSAs in the country. This report format allowed for identification of the MSA advantages, challenges, statistical description/profile, and the output data itself. An additional section added for this PI was entitled *American Fitness Index Output Notable Result for Pima County*, which allowed for further discussion of significant findings in context of recent data. These are discussed within the various indicators.

**Demographics**

The population of Pima County was 980,263. A total of 23 percent of the population were less than 18 years old, while 61 percent were between 18 and 65 years old, and 16 percent were greater than 65 years old. Approximately 50 percent of Pima County was female. Eighty-seven percent of the population had a high school graduate degree or higher. Seventy-four percent of the population were White, 35 percent were Hispanic, 3.5 percent were African-American, and 2.6 percent were Asian. Pima County had an 8.4 percent unemployment rate and a median household income of 46,443 dollars per household. Approximately 15.6 percent of Pima County families were reported to live below the poverty line.

**Comparison of Personal Health Indicators**

There were some advantages that became apparent after implementing the ACSM-AFI. (see Figure 2 American Fitness Index Pima County MSA Description, Figure 3 American Fitness Index Output Notable Results for Pima County, Figure 4 American Fitness Index Output Components for Pima County). Advantages were identified as $\geq 2.5\%$ difference in
percentages or $\geq 20\%$ difference in numerical values that yielded a better response than the national average per ACSM-AFI Index recommendations (ACSM, 2013). The first advantage was that Pima County has a lower percent of residents currently smoking when compared to the national average (18.7% vs. 21.2%). Pima County has a higher percent of moderately physically active residents than the national average (25.7% vs. 21%). Pima County also has a lower percent of obese residents than the national average (20.5% vs. 27.8%).

There were some challenges also identified after the analysis was completed. Challenges were identified as $\geq 2.5\%$ difference in percentages or $\geq 20\%$ difference in numerical values that yielded a worse response than the national average (ACSM, 2013). The first challenge noted is that Pima County has a lower percent of residents with health insurance (82% vs. 89%). The second challenge was that Pima County has a higher percent of asthma than the national average (12.5% vs. 9%). Pima County has a 23 percent higher death rate from diabetes per capita than the national average (29.3/100,000 vs. 22.4/100,000). Pima County also has a 24.7 percent higher death rate from cardiovascular disease per capita than the national average (252.2/100,000 vs. 193.6/100,000).

All additional personal health indicators were either similar in measurement or not applicable due to lack of data. Similarities between measurements were identified as $\pm 0-2.4\%$ differences in percentages or $< 20\%$ difference in numerical values regardless of the positive/negative data trend (ACSM, 2013). The data set that could not be completed for this section was the percent eating 5+ servings of fruits/vegetables per day. The ACSM took into account basic nutrition data for this ACSM-AFI analysis. However, these data were not available for the Pima County MSA. All other data were similar and unable to be identified as
advantages or challenges.

Comparison of Community and Environmental Health Indicators

All advantages, challenges, and similarities were identified using the same parameters as defined in the previous section. The first advantage identified for Pima County was that there are more park-related expenditures per capita than the national average ($52.8 millions vs. $45.7 million). The second advantage is that there are more swimming pools per capita in Pima County than nationally (4.6/100,000 vs. 3.1/100,000). There are more recreational centers per capita in Pima County than nationally (2/20,000 vs. 1/20,000). A final advantage is that there are more golf courses per capita in Pima County than nationally (5.1/100,000 vs. 0.9/100,000).

The first challenge identified for Pima County is that there is lower parkland as a percent of city land area than the national average (3.1% vs. 8.1%). Pima County has a lower level of state requirements for Physical Education classes than the national average (2 vs. 2.5). There are a lower number of primary care providers per capita in Pima County when compared the national average (80/100,000 vs. 93.7/100,000). Pima County has fewer dog parks per capita than the national average (0.1/100,000 vs. 1.9/100,000). Pima County has fewer baseball diamonds per capita than the national average (0.21/10,000 vs. 1.9/10,000). A final challenge is that Pima County has 5.2 percent fewer acres of parkland than the national average (7.2/1,000 vs. 12.4/1,000).

All other community and environmental health indicators were either similar in measurement or not applicable due to a lack of data. The data sets that could not be completed for this section were the tennis courts per 10,000 residents, park units per 10,000 residents, percent using public transportation to work, and farmers’ markets per 1,000,000 residents. All
other data were similar and unable to be identified as an advantage or challenge.

Community Stakeholder Identification

The AMSC (2013) states that in order to impact policy change, one must first educate policy makers about the issues that concern the coalition and be strategic in creating awareness. Influencing public policy to in order to facilitate the desired change is the goal. The major areas of advocacy to pursue are government policy, non-government policy, media, and education (ACSM-AFI, 2013). When contacting these policy groups, there are suggested rules for advocacy and communication.

Specific advocacy rules are outlined by the ACSM (2013):

1. Get to know legislators, their districts, opinions, and expertise.
2. Acquaint yourself with the staff members of legislators, committees, and resources.
3. Identify fellow advocates and partners in the public health community.
4. Identify groups and other legislators whom you may need to negotiate for changes in legislation.
5. Strengthen relationships with allies and work with legislators who are flexible.
6. Be honest and straightforward when working with legislators.
7. Be polite and thank those who help you in the legislature or advocacy community.
8. Learn and understand the legislative process.
9. Be brief, clear, accurate, and persistent when communicating your position.

Government Policy

Government policy contacts that would be applicable to Pima County would be the Pima County Health Department, the Pima County Board of Health, the Pascua Yaqui Tribe Health
Department, and local mayors, such as Tucson’s Jonathan Rothschild. The ACSM (2013) states that community-based organizations that want to participate in policy issues need to have a clear understanding of who makes decisions, how decisions are made, and how policies are introduced.

**Non-government Policy**

In addition to public policy that is enacted by lawmakers and regulatory agencies, policy can also be implemented by community institutions such as businesses and industries (ACSM, 2013). One of the major topics to motivate this focus is physical activity and employee health. An important detail to consider is that health promotion activities are likely to yield greater returns from increased employee productivity than from medical care cost-savings (ACSM, 2013). An important contact in Pima County would be the Pima County Business Community. This is an organization that would be motivated by cost-saving interests and would benefit from improved employee physical fitness.

**Media**

The ACSM recommends using media as a tool to reach stakeholders. Media can be used to educate the public about what causes or contributes to the physical inactivity epidemic in our nation, frame the physical inactivity epidemic as a social concern that affects everyone, and promote services and resources that encourage physical activity within the community (ACSM, 2013). One possibility is to write a letter to the editor of the local newspaper to educate the public and bring awareness of the physical inactivity epidemic in the community (ACSM, 2013). The ACSM (2013) also states that the media can be the most efficient way to communicate with the largest audience possible in the least amount of time. Locally, there are several media
outlets, including local news and newspapers. Examples of local news stations for contact would be KOLD News 13, KMSB News 11, and KVOA News 4. An example of a local newspaper is the *Arizona Daily Star*.

**Education**

Education resources are important to take advantage of when considering policy changes for physical fitness. The ACSM (2013) states that regulations and codes might be established by community agencies such as education departments and school boards. An example of local education resources to contact would be The University of Arizona, Pima Community College, the Pima County School Superintendent’s Office, the Tucson Unified School District and, the Sunnyside School District.

**Summary**

The aims for this PI were fulfilled during the implementation of the ACSM-AFI. The ACSM-AFI assessment was conducted according to the AFI instrument instructions. Output was generated, which included a list of advantages, challenges, a description of the Pima County MSA, notable results, and an output of ACSM-AFI components similar to those done by the ACSM on 50 major cities in 2013 (ACSM, 2013). This allowed for better analysis and identifiable health disparities.

The personal health indicators as well as the community/environmental health indicators were compared for Pima County and the national averages. Results were either classified as advantages, challenges, similarities, or non-applicable due to incomplete data.

The appropriate Pima County stakeholders, as well as rationale, were identified. Government policy, non-government policy, media, and education were all identified as
pertinent contacts that would be necessary in order to identify stakeholders and strategize an intervention. Potential contacts for Pima County were identified in each of the four recommended areas of networking.
CHAPTER FIVE – DISCUSSION

The purpose of this PI was to use the American College of Sports Medicine American Fitness Index (ACSM-AFI) instrument to identify personal and community health disparities in Pima County and to identify pertinent stakeholders who would benefit from these findings.

The aims of this PI were to conduct the ACSM-AFI assessment in the Pima County Metropolitan Statistical Area (MSA), compare personal health indicators with national averages, compare community/environmental health indicators with national averages, identify improvement priority areas, and identify appropriate stakeholders.

Principal Findings

The first advantage noted in the ACSM-AFI was that Pima County has a higher percent of moderately physically active residents than the national average. Additionally, Pima County has a lower percent of obese residents than the national average. This is encouraging to consider because reports from one year prior suggested that the obesity rates in Pima County were closer to 24 percent (PCHD, 2012).

The increased number of physically active residents along with the decreased rates of obesity are encouraging, in the sense that current implementation of physical activity initiatives are either effective or the situation regarding community physical activity and exercise is not drastically negative. On the other hand, even though 78 percent of the Pima County residents had performed physical activity in the past thirty days (at the time of data collection), only one in four residents achieved daily moderate physical activity. If future physical activity change campaigns are developed, improving the physical activity status of the community should be the focus, and this indicator would be important evidence.
The data show that Pima County spends more than the national average per capita on park-related expenditures even though Pima County has lower parkland as a percent of city land area than the national average. Also Pima County has 5.2 percent fewer acres of parkland than the national average. The data show that there is less established parkland in cities and the Pima County MSA than the national average. However, this is still significant, considering that physical fitness resources include maintaining public recreational lands. Maintaining these lands further promotes physical activity by giving the community an environment in which to exercise.

In addition to this, Pima County has more recreational centers per capita than the national average, more golf courses per capita than nationally, and more swimming pools than the national average. These data are not surprising, considering that both swimming and golfing are major recreational activities, which are prominent in Pima County. However, it is notable that there are more recreational centers in Pima County than the national average, which means that the focus for physical activity initiatives might be to encourage the community to take advantage of exercising at these recreational centers instead of questioning whether there are enough in the first place.

Some challenges were identified after the ACSM-AFI analysis was completed. The first challenge noted is that Pima County has a lower percent of residents with health insurance than the national average. This indicator is significant because it affects Pima County residents’ access to health care and to primary care providers.

Primary care providers play a key role in improving physical health and decreasing risks for sedentary-lifestyle-related diseases, such as diabetes (CDC, 2009). This is an important indicator, considering that Pima County also has 13 percent fewer primary care providers than
the national average. The lower number of providers suggests that Pima County is at a
disadvantage when it comes to health care coverage, and this should be a point of policy interest.
This PI does not include any data regarding the recent implementation of the Affordable Care
Act and, therefore, does not take into account any data regarding recent health care coverage
enrollment. This indicator could be used as a strategy to encourage more Pima County residents
to enroll in insurance coverage.

Not only is primary care coverage an issue, but health care and cause of death from
chronic illnesses is a significant challenge in Pima County when compared to the national
average. Pima County has a 23 percent higher death rate from diabetes per capita than the
national average. This is a significant health indicator because diabetes continues to be the
leading cause of kidney failure, non-traumatic lower-extremity amputations, and blindness
among adults aged 20–74 (CDC, 2009b). This indicator could be reflective of the poor primary
care coverage in Pima County. The CDC (2009b) states that management of diabetes and its
complications require public health efforts, daily monitoring of blood sugar, annual foot exams,
eye exams, influenza vaccines, and pneumococcal vaccinations. Primary care providers
generally manage all of these requirements. A significantly larger mortality rate from diabetes
and a correlation between low primary care provider coverage in Pima County should be an area
of focus for policy makers. A future strategy could be formed with a central theme of primary
care prevention to offset high morbidity and mortality from diabetes and diabetes-related
complications.

Pima County also has a 24.7 percent higher death rate from cardiovascular disease per
capita than the national average. According the PCHD (2012), cardiovascular disease is the
leading cause of death in Pima County. Approximately 1/3 of adults report having two or more of the major risk factors for heart disease and stroke including: high blood pressure, high cholesterol, diabetes, current smoking, physical inactivity, and obesity (CDC, 2009b). The notable risk factors pertinent to this PI are physical inactivity, obesity, and metabolic syndrome. A similar approach, as proposed in the diabetes mortality discussion, can be adopted with regards to improving access to primary care and preventative strategies to reduce cardiac mortality in Pima County.

A positive finding regarding cardiac health was that Pima County has a lower percent of residents currently smoking when compared to the national average. This is important because smoking contributes to several disease processes, including cardiovascular disease and cancer, which are the two leading causes of death in Pima County (PCHD, 2012). The lower percent of smokers could be a measure of successful anti-smoking policy implementation, and continuous surveillance could further monitor this success.

Pima County has a lower level of state requirements for Physical Education classes than the national average. This is a crucial problem because elementary and high school students are at an increased risk for obesity, with lower physical activity levels and lower fruit and vegetable consumption in Arizona youth when compared to their national counterparts (CDC, 2013). Initiatives that have already occurred in Pima County are School Health Advisory Councils in 11 school districts and trained wellness and district coordinators who focus on how to improve nutrition and physical activity in public schools (CDC, 2013). Promotion of physical fitness outside of school has also been discussed by the CDC and includes awareness and use of Pima County bicycle and multiuse paths for recreation, fitness, and active transportation (CDC, 2013).
An additional focus that should be considered is addressing physical education requirements and improving them so that physical fitness can also be a part of the solution.

Statistics on violent crime in Pima County are important to focus on even though this is not included on the ACSM-AFI output. Pima County has 16.4 percent more violent crime than the national average. This is noteworthy because a finding earlier in this PI was that physical activity is correlated with the safety of the neighborhood and the environment. If residents do not feel safe going outdoors to exercise, they remain indoors and are more likely to become sedentary (Sun et al., 2012). Therefore, awareness of neighborhood safety can help to educate policy members that the more safe a community is, the more likely the residents will participate in physical activity outdoors. More physical activity would improve the overall fitness levels of the community residents.

Some lingering environmental challenges are that Pima County has fewer dog parks per capita than the national average and fewer baseball diamonds per capita than the national average. City planners and physical fitness legislators could use these data when considering parkland use. Recreational and city park resources can be strategized towards these challenged areas in order to correct these deficits. Initiatives for improving neighborhood safety would encourage more physical activity as well.

Strengths and Limitations

A strength of using the ACSM-AFI was that there were clear instructions on what data were necessary and where to enter it into the instrument. Directions for where to find the data were also provided in detail. Having this direction reduced the risk of using outdated or inaccurate data from non-credible sources. It also increased the legitimacy of the ACSM-AFI
analysis because the same data sources that were used for this PI were also used for the other MSA’s conducted by the ACSM in the past. Mainly government and state-sponsored databases were used for the ACSM-AFI analysis.

One major limitation of this PI was that not all data points were available to be entered. In the Personal Health Indicators section, the percent eating 5+ servings of fruit per day was not available for the Pima County MSA using the recommended resources. In the Recreational Facilities section, the tennis courts per 10,000, park units per 10,000, percent using public transportation to work, and farmers’ markets per 1,000,000 were not available for the Pima County MSA using the recommended resources.

Another limitation of this PI was that there was no formula available to synthesize the ACSM-AFI obtained for Pima County, so that the Pima County MSA could be added into the rankings amongst the 50 largest MSA’s in the country which were already established by the ACSM one year ago (ACSM, 2013). This was unfortunate because a comparison of where the Pima Country MSA was ranked amongst other MSAs would have been a beneficial perspective to have for determining personal health indicators and community/environmental indicators relative to the featured cities.

Meaning of this Study

This study was meant to assess the health status of Pima County using the ACSM-AFI. All aspects of the study were listed in the PI Aims. An initial literature review showed that lack of physical activity was highly correlated with obesity, metabolic syndrome, and various socioeconomic barriers. Evidence of these indicators was present in the Pima County MSA.

Indicators showed that there were a larger number of deaths from diabetes and
cardiovascular disease. Both of these diseases have an established relationship, based on prior literature, with metabolic syndrome and obesity. However, obesity rates alone were not different and, in fact, were lower than the national average. The focus of a possible contributing factor is the lack of health care in Pima County compared to the national average. An overall poorer insurance coverage profile and fewer providers per resident are possible reasons.

An additional parallel included community safety. This theme was also found in past literature as a contributing factor to physical inactivity. In general, if the community is not safe, the residents will not take advantage of physical activity opportunities that are provided throughout the community. The crime rate in Pima County is higher than the national average, which would also suggest that a focus on improving community safety would improve physical activity rates for Pima County residents.

Implications for Clinical Practice

A major theme repeated in this PI is the lack of healthcare coverage in the Pima County MSA. It is possible that higher deaths from diabetes and cardiovascular disease-related complications are a measure of poor disease control at the primary care level. This would be evident by the low number of primary care providers per resident as well as poor insurance coverage. This justifies a culture of primary disease prevention and health promotion that is already being practiced by primary care providers. However, the impact of this indicator may serve as a reminder of the importance of practicing preventative medicine. This may urge providers to take more advantage of diabetic and cardiovascular health resources so that patients can have support and education before the disease process progresses.

Questions for Further Research
Future research should consider extending the findings of this PI to compare the Pima County MSA with other major cities in the United States. The ACSM-AFI was applied to the top 50 MSAs in the United States, and it would be beneficial for community leaders and policy makers to have this comparison present. It would allow for comparison of other similar MSAs and could provide direction on the best way to improve noteworthy challenges that have been identified. Successful physical activity health promotion efforts in MSAs similar to Pima County could also be studied and implemented.

Summary and Conclusions

The ACSM-AFI instrument was successfully implemented for Pima County, Arizona. The output was formatted per ACSM-AFI standards. Comparison to national averages showed both advantages and disadvantages regarding personal and community/environmental indicators.

Based on the results obtained, there seems to be some indication of initial success in the current physical activity levels, possibly aided by the presence of some recreational resources. However, there are still a significant number of residents who do not meet the physical activity requirements. Major barriers to achieving adequate physical activity include poor healthcare coverage, increased rates of cardiovascular mortality, increased rates of diabetes mortality, and environmental safety. Future policy changes could be implemented to improve mortality rates by enabling more health care coverage for Pima County residents. With increased preventative health care measures, management of chronic diseases, such as cardiovascular disease and diabetes, can be more effective in reducing morbidity and mortality. Awareness of the crime and safety profile of Pima County can enable policy makers to focus on improvement and, therefore, increase physical activity within the community because residents will feel safer leaving their
homes when seeking out physical activity resources. 

Pertinent stakeholders were identified using the ACSM-AFI instrument. Four major areas of contact were identified. This included government policy, non-government policy, media, and education. There is a strategy available in each of these outlets for raising awareness and launching interventions that will improve the overall health of Pima County residents by improving physical activity. An example of each area includes the Pima County Health Department, the Pima County Business Community, the Arizona Daily Star, and The University of Arizona. Strategies can be formed on each of these fronts to address physical activity barriers and solutions.

Ultimately, the results obtained suggest that the physical fitness profile of Pima County, Arizona is similar or better than the national average. The major deficits identified were health care coverage, cardiovascular and diabetes mortality, and environmental safety. These results should be the major focus for stakeholders and community leaders, with strategies for improvement implemented. Potential focal areas should be increased health care coverage for residents, preventative healthcare, cardiovascular and diabetes management, and community safety. With this information, stakeholders and community leaders can improve the health disparities of Pima County residents and maximize quality of life within the community.