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Management of Hypertension in Student Patients in a University Student Clinic

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The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Assistant Dean for MSN and DNP Studies, on behalf of the program; we verify that this is the final, approved version of the student's DNP Project including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

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DNP Practice Inquiry Project Report

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University of Kentucky

College of Nursing

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Dedication

I would like to dedicate this project to my husband Jim, who has shown unwavering patience, and has provided emotional support. He has encouraged, and sometimes prodded, to keep me on course. I would also like to dedicate this project to my clinic director, Dr. Shannon Smith-Stephens, who has served on my committee and provided technical support within the clinic while I was engaged in my study. In addition, I would like to thank my co-workers: Leigh Ann Ruggles, who has been the sole provider in the clinic when classes and advising required me to be in Lexington; also, the nurses and other staff members for being receptive to my project and the protocol that was developed.

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Introduction to DNP Practice Inquiry Project

This Practice Inquiry Project report consists of three manuscripts. The first manuscript is a literature review exploring the use of the balanced scorecard in healthcare. The Morehead State University Counseling and Health Services clinic aspires to a long-term goal of using a balanced scorecard as a quality improvement tool. As a balanced scorecard is an undertaking that requires a significant investment of time to develop, a fully developed scorecard was not a realistic objective for this practice inquiry project. Hypertension is a commonly seen chronic condition in the 18 to 24 age group. The National College Health Assessment (NCHA), a survey of approximately 80,000 U.S. college students aged 18-24 years, conducted in the spring and fall each year in the United States, has repeatedly demonstrated that the majority of these students have a poor diet, and less than half meet recommendations for cardio or aerobic exercise; over a third are overweight or obese (American College Health Association [ACHA], 2015). Estimates of markers for metabolic syndrome in this age group has ranged from 9 percent to 34 percent (Morrell, Lofgren, Burke, & Reilly, 2012). The National Health and Nutrition Examination Survey (NHANES) estimated the prevalence of metabolic syndrome in the 20 to 29 age group at 22 percent. This puts them at higher risk for hypertension, cardiovascular disease, and diabetes.

The second manuscript outlines steps followed in instituting protocol for management of hypertension in college-aged patients, who have been diagnosed with hypertension, in a university clinic. The setting where the protocol was introduced was the health clinic division of the Morehead State University Student Counseling and Health Services. The third manuscript documents a study of the management of hypertension carried out at the Morehead State University health clinic. First a hypertension treatment protocol was developed and put into practice. Staff members were familiarized with the protocol and a retrospective chart review was

done after the protocol had been in place for five months to 1) assess for the prevalence of elevated blood pressure in college students seeking care in the MSU student clinic, 2) develop clinic guidelines for treatment and management based on JNC 8 guidelines to reach a goal of maintaining the diastolic blood pressure of 75 percent of the hypertensive patients in the clinic at a systolic pressure of less than 140 mm Hg and diastolic pressure of less than 90 mm Hg., 3) evaluate provider compliance with clinic hypertension protocol, and 4) evaluate outcomes including assessing for improvements in blood pressure, lipid values, and weight. The focus of the audit was to collect demographic data, blood pressures, LDL's, evidence that lifestyle management recommendations were discussed with the patients, and to survey antihypertensive medications that were prescribed. Preferred medications were those recommended for patients in the protocol. According to Healthy People 2020, much of the financial burden of preventable health problems and the long-term costs of chronic diseases can be attributed to behaviors begun during adolescence lending increased importance to detecting and managing hypertension in the college aged population (Healthy People 2020, n.d.).

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Manuscript One

Literature Review:

College Health Balanced Scorecard

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Abstract

Purpose: A literature review was conducted to identify studies dated 2000 or later which examined the use of the balanced scorecard in healthcare organizations. Priority was given to articles that focused on the use of the Balanced Scorecard in college student health clinics.

Method: Electronic reviews of CINAHL, MEDLINE (EBSCOHost), and Academic Search Complete were conducted to identify articles appropriate for inclusion. Primary consideration was given to articles related to healthcare in the United States with the additional inclusion of influential studies and articles from Great Britain and Canada. The search terms "scorecard and healthcare." "balanced scorecard and healthcare" and "college health and scorecard" were used. Articles reviewed were those that met the criteria for the use of the balanced scorecard in healthcare organizations. Earlier seminal works were also included for historical perspective.

Findings: 27 articles met inclusion criteria and were reviewed. There were few studies found that focused on the use of the balanced scorecard in academic student health centers. Conclusions: The Balanced Scorecard is a relevant quality management tool for use in healthcare organizations and has a favorable outlook for successful use in college clinics**.**

Clinical Relevance: The Balanced Scorecard has the potential to be an effective quality management tool for healthcare organizations with adaptation to meet the needs of various health care entities including college health clinic settings. Careful strategic planning based on mission and vision is needed as well as long-term commitment.

Background

Kaplan and Norton first introduced the concept of the balanced scorecard for the strategic management of business organizations in 1992. Traditional management systems were unable to link short-term actions to long-term strategy. The balanced scorecard was developed to address this shortcoming by assessing performance measures in four areas, or perspectives, and their relationships in affecting outcomes: financial, customer satisfaction, internal business, and learning and growth (Kaplan & Norton, 1992). Inamdar & Kaplan (2002) state that the balanced scorecard is a strategic quality "multidimensional framework for describing, implementing, and managing strategy at all levels of an organization by linking objectives, initiatives, and measures to an organization's strategy" (p. 180). The framework focuses on customer satisfaction, facilitates monitoring and assessment of strategy, provides a means for communication and collaboration among stakeholders, assigns accountability for performance, and provides feedback to facilitate adjustments in strategy as needed (Inamdar & Kaplan, 2002, p. 179). Zelman, Pink, and Matthias (2003) stated that balanced scorecard concepts are relevant to use in health care, but they must be modified to reflect the unique needs of the health care industry. The four perspectives can be modified to better represent the inner workings of the healthcare organization.

As a result of the passage of the Affordable Care Act in 2010, there are millions of new insured patients in the healthcare system. The primary care workforce is thought to be pivotal to success in meeting the needs of the newly insured as well as those patients who were already insured and partaking of primary care services. As a result, primary care practices will play a central and influential role in determining the success of Accountable Care Organizations (McWilliams, 2013). The Affordable Care Act provided for rewarding financial incentives for

improving quality of care and reducing costs for Medicare patients. State Medicaid programs have been joining the effort to improve quality and reduce costs by devising their own risk-based models of healthcare reform (Barr, 2015). As a result, primary care practices are being encouraged to change their models from fee-for-service management to value-enhancing activities such as counseling and shared decision-making to improve the health of their patients (McWilliams, 2013). Many healthcare organizations, that previously lacked measures to improve quality and safety, have begun creating scorecards to monitor and improve quality and safety (Pronovost, Berenholtz, & Needham, 2007).

While balanced scorecards have been used most in hospital settings, there is little evidence from review of the literature that primary care settings, or college health clinics have adopted their use. According to Healthy People 2020, much of the financial burden of preventable health problems and the long-term costs of chronic diseases can be attributed to behaviors begun during adolescence (U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion, n.d.). College student health clinics are in a position to provide health services that are centered on the unique needs of this population. These services should be centered on health promotion and disease prevention while enhancing individual and group health and safety (American College Health Association [ACHA], 2012). Just as primary care clinics have an increasing need to monitor and improve quality, safety and value, college health clinics have a similar need. This is especially true in light of budget cuts to public universities in recent years.

The balanced scorecard is being increasingly utilized in healthcare to measure performance and to demonstrate the value of a healthcare entity. Patients receive higher quality care when health-care organizations use established performance measures to evaluate, monitor

and improve performance (Roberts et al., 2009). With the advent of electronic health records, large amounts of data are available that can aid in assessing quality. The balanced scorecard can help extract meaningful data from all of the information available, focus on what is important and analyze relationships that may impact outcomes (Park & Huber, 2007). The purpose of this literature review was to explore the available literature that describes how healthcare organizations identify the need for a balanced scorecard, then develop and implement the scorecard, with particular interest in whether scorecards can be effectively used in the college student health setting to guide significant improvement of quality, safety and efficiency of healthcare, and demonstrate value of services.

Methods

The search engines CINAHL, MEDLINE, EBSCOHost, and Academic Search Complete were used to identify peer-reviewed studies and expert articles from 2000 to 2015 that were appropriate for review. Primary consideration was given to articles related to healthcare in the United States with the additional inclusion of high-quality studies and articles from Great Britain and Canada. The search terms “scorecard and healthcare,” “balanced scorecard and healthcare,” and “college health and scorecard” were used. Seminal works published prior to 2005 were also included for historical perspective. Articles reviewed were those that met the criteria for the use of the balanced scorecard in both for-profit and not-for-profit healthcare organizations. A search of the American College Health Association website was also conducted to investigate the use of balanced scorecards in college health student clinic settings and to identify key performance indicators of importance in college health settings. Key performance indicators are measurable values that indicate how well an organization is meeting its stated objectives. In a college health setting, key performance indicators in a balanced scorecard would be chosen to measure

outcomes that are specific to the health and safety of the college student population. 27 articles met inclusion criteria and were reviewed. (See Table 1)

Results

The articles were a mix of case studies and expert reviews of balanced scorecard approaches used in a variety of healthcare settings, including large and small hospitals, primary care settings and specialty group settings. One of the articles examined the use of the balanced scorecard in academic health centers but the discussion in the article was not specific to the student health clinic setting. One article reviewed a variation of the Balanced Scorecard, the Competing Values Framework – CVF, comparing it to the Balanced Scorecard Framework (Wicks, 2007). That article was included because it presented a helpful critique of some possible drawbacks of using the Balanced Scorecard framework in healthcare non-profit service organizations. Since no articles were found in the database searches that discussed the use of a balanced scorecard in a college or university health setting, a subsequent search of the Internet was done. This resulted in locating a presentation of the use of the balanced scorecard in a university health clinic setting that included a copy of the balanced scorecard used in that setting. Because a paucity of literature was found on balanced scorecards in college student health clinic settings, the perspectives and key performance indicators used for the scorecards of other types of health care organizations could provide insight into adaptation of the balanced scorecard framework to the college health setting.

The Balanced Scorecard

Framework. The original Balanced Scorecard framework, as developed by Kaplan and Norton, contained performance measures in four areas: financial, customer satisfaction, internal business, and learning and growth (Kaplan & Norton, 1992). That framework was used in all of

the articles with the exception of one.

Mission and vision. The balanced scorecard framework does not replace the need for a mission, vision and organizational strategy but complements them by providing a means to organize, monitor and measure strategic objectives developed to achieving the organization's mission and vision. As stated by Inamdar & Kaplan (2002), the overriding purpose of the balanced scorecard is to use the framework as a tool to "translate an organization's mission and strategy into a comprehensive set of performance measures and strategically aligned initiatives" (p. 181). According to Rimar, Morahan and Richman (2000), before developing and implementing a balanced scorecard, an organization should have a mission that clearly describes the reason for the organization's existence. A vision statement should be developed that provides an overall direction for accomplishing the mission. The vision statement should be specific, realistic and should guide strategy to accomplish the organization's mission. The specific purpose of a strategy and goals should be to ensure that an organization accomplishes its mission and vision (Schwartz, 2005). Thus, key elements should be extracted from the mission and vision statements to generate the framework for the scorecard, to identify strategic priorities, and to choose appropriate objectives (Gumbus & Wilson, 2004).

Strategy. In order for a balanced scorecard to be effective, an appropriate strategy must be planned prior to developing the scorecard. Kaplan and Norton identified four processes that they believed should be followed in developing a strategy. These processes form a planning and feedback system that allows for testing of the strategy. The first three processes, "translating the vision," "communicating and linking," and "business planning," are essential for planning and implementing strategy, while the fourth process, "feedback and learning," takes strategy full-circle (Kaplan & Norton, 2007, para 5-8). This periodic review allows companies to "re-assess

assumptions and theories about cause-and-effect relationships," thereby guiding corrections to strategy to account for changes in threats and opportunities, or to adjust for previously unforeseen relationships (Kaplan & Norton, 2007, p. 158; see example of a Strategy Map for the college health setting in Figure 1.)

When developing a strategy, it is important to consider a combination of lead and lag indicators (Haworth, 2008). Lag indicators include outcomes, expenses and return on investment and are measures of results at the end of a period of monitoring. Lead indicators are in-process measures that can be *predictive* of outcomes, such as patient satisfaction, safety measures, and adherence to evidence-based practice guidelines. Once strategy is defined, the balanced scorecard facilitates translating strategy into appropriate and measurable actions along perspectives first defined by Kaplan and Norton (1992) or perspectives adapted to the needs of a specific organization.

Perspectives. The four perspectives that are used in a typical balanced scorecard can be used in healthcare or can be adapted to better fit the organization's mission. In a non-profit setting, the financial perspective may not be the most important perspective as it is for a for-profit business or clinic; in this setting, the customer perspective may be the priority (Voelker, Rakich, & French, 2011). Closely following the customer perspective would be the internal business perspective, followed by learning and growth. The financial perspective remains important because, although profit is not a priority, any health organization must remain at least financially viable. The literature review revealed that many organizations change or adapt the perspectives to fit their particular needs. "Perspectives that are commonly added to balanced scorecards for health care organizations include quality of care, outcomes, and access" (Zelman et al., 2003). Voelker, Rakich, & French (2001) maintain that "changing the scorecard does not

change the model itself; it reflects strategy" (p. 17). Although the following discussion of the four perspectives is centered on the typical perspectives, an example of a balanced scorecard for college health, with modified perspectives, is shown in Table 2.

Customer. Customer satisfaction can be measured by surveys of patients who use the services of a healthcare organization. Goodspeed (2006) recommends that rural hospitals define customers as the patients, the physicians and the community. The U.S. Department of Veterans Affairs (VA) Stars and Stripes Health Network's balanced scorecard uses a three-question survey to query patients; it includes questions about education and information provided, pharmacy services and patient complaints. Also included in the customer perspective is a measure of employee engagement as determined by a yearly survey of employees (Biro, Moreland, & Cowgill, 2003).

Internal. Internal issues measured may include quality of care, outcomes, and access, which were deemed to be important healthcare metrics by Zelman et al. (2003). Monitoring performance with appropriate indicators helps to identify shortcomings and see where improvements are needed to ensure that patients receive high-quality service (Grant & Proctor, 2011). Rural community hospitals may consider setting goals that meet the needs of patients, the community, and physicians (Goodspeed, 2006). The scorecard should help measure and improve patient satisfaction and clinical productivity (Crabtree, 2011). The VA Stars & Stripes Network measures quality by adherence to overall clinical practice guidelines and a comprehensive prevention index (Biro et al., 2003). To evaluate performance, timeliness and number of patient compensation and pension examinations completed are measured. These examinations reflect claims of disability related to active military service and have a high priority

in the VA System. Access to care is measured by number of wait days for various departments (Biro et al., 2003).

In one study of nursing in a sample of acute care hospitals in Ontario, Canada, indicators from existing balanced scorecards were used to determine how nursing staffing levels affected clinical outcomes, patient satisfaction and financial indicators (Hall et al., 2007). At Bridgepoint Health, in Toronto, Canada, a large hospital for complex disease management and rehabilitation, strategy mapping was used to develop a balanced scorecard with best practice nursing indicators for the purpose of optimizing nursing processes and organizational capabilities (Jeffs, Merkley, Richardson, Eli, & McAllister, 2011). Indicators were selected to show the relationship of nursing care to patient, financial, organizational and system level outcomes. The use of a BSC led to marked improvement in scores on customer service surveys, and improvements in several quality indicators including an increase in preventive healthcare measures.

Specific internal items measured in the Rensselaer University student health clinic's scorecard included immunization rates, response to counseling outreach programs and knowledge increase from education programs as measured by pre and post tests. Measured outcomes of evidence-based medical treatments were centered on pharyngitis and asthma. In this scorecard, medical issues represented in the scorecard could easily be adapted over time to include those that are currently deemed most appropriate. This could be based on EHR reviews of frequency of diagnoses or seriousness of the health problems seen in the clinic. The Rensselaer scorecard also included a process measurement that indicated that the clinic would conduct to monitor adherence to evidence–based guidelines and reporting on outcomes.

Learning and growth. Learning and growth perspectives should consider the skills, culture and technology needed to be successful. Objectives may be related to staff training,

nursing staff turnover, and staff loyalty and engagement (Goodspeed, 2006). Employee learning and growth should be seen as an "enabler" that will help the organization achieve other performance objectives. Learning and growth promotes best practices and sharing of results (Gumbus & Wilson, 2004, p. 229-231). Professional development metrics included peer reviews, measurement of participation in professional conferences yearly, and a measurement of the level of EHR use.

Financial. Metrics in the financial perspective monitor income, expenditures and improve efficiency in the use of financial resources (Grant & Proctor, 2011). The primary aim of financial management in a for-profit business is to maximize cash flow and profit for the organization (Kaplan & Norton, 1996). In healthcare organizations, as in most if not all other organizations, financial performance is a lag indicator that depends on the success of other factors including strategy and service (Dugger, 2014). The primary objective may be to operate within budget (Haworth, 2008). For financial management to be successful, "risk must be managed as well as return" (Kaplan & Norton, 1996, p. 49). Financial measures related to healthcare may include percentage of collections received and measures of adherence to budget as in the VA Stars & Strips System (Biro et al., 2003). Rural hospitals may place importance on objectives that measure long-term sustainability and resources needed to fulfill the hospital's mission in the community (Goodspeed, 2006).

Objectives. With the vision and strategy as a guide, specific objectives should be developed for each of the four perspectives that will eventually make up the organization's balanced scorecard. Objectives should be consistent with accomplishing the overall vision and should be measurable. Measures must address the objectives, must be obtainable in the organization, must have meaning to the staff and must be realistic and adequate (Rimar,

Morahan, & Richman, 2000). In order for the balanced scorecard approach to be successful, staff members should be active participants in the development of realistic and meaningful shared objectives and measures to build trust and to sustain interest in achieving goals. To maintain the interest of the staff in achieving objectives, the scorecard should be visible and accessible (Haworth, 2008).

Measures. The implementation of electronic healthcare record systems has resulted in large amounts of data that can be accessed to provide metrics for measuring the success of objectives in a balanced scorecard. Numeric data affords the possibility of visualizing inter-relationships among objectives in the chosen perspectives. Often organizations put related information in the scorecard in blocks, or color code data, to more easily identify levels of acceptability in results or for creating an easily visualized warning that corrective action may be needed (DeBlois, 2007; Grant & Proctor, 2011; Rees & Houlehan, 2013). The balanced scorecard thus provides a snapshot view of how well performance is meeting expectations (Crabtree, 2011).

According to Pronovost, Berenholtz, & Needham (2007), "measures to evaluate progress must be important, valid, and used to guide improvements in patient safety" (p. 2065). Schwartz & Schwartz (2005) maintain that the balanced scorecard should include no more that 23-25 total measures. Schwartz & Schwartz further state a belief that internal processes could have as many 5s 8-10 measures since this perspective involves key supporting processes that help to align strategy and assess improvement. Balanced scorecards have been developed in several ways including using dedicated software, with Microsoft Excel or other spreadsheet program, or can be a paper-based version. Using software allows for easier and quicker updating of information and measurements.

Feedback. Once a strategy has been formulated, the balanced scorecard has been implemented, and data has been collected, there should be some type of feedback to providers as the last step in the balanced scorecard process. Periodic updates of measures may be done monthly or quarterly depending on the needs of the organization. These metrics can be plotted across time periods on run charts, from baseline to the current QI period, to better illustrate trends (Roberts et al., 2009). Multiple metrics may be tracked on a single chart, with each variable having its own line. Statistical analysis can be done to test for significant change using a statistical software package such as SAS (Roberts et al., 2009).

The scorecard could be easily used for single loop feedback, but double loop feedback can result in quarterly or yearly revisions to improve the utility of the scorecard (Park & Huber, 2007). Feedback loops facilitate learning and decision-making. Single-loop learning involves identifying problems that may be interfering with strategy or preventing an organization from reaching pre-determined goals. Corrective action is taken without changing the strategy or goals. Applying strategies to achieve desired outcomes may occur multiple times but, if not successful, strategies and goals may need to be examined. Double-loop learning occurs when corrective actions are unsuccessful and strategies and goals are re-evaluated.

Strengths and limitations. There are challenges and barriers that may be encountered in implementing a balanced scorecard. The ability and readiness of an organization to support the implementation of a balanced scorecard must be assessed. Management must be convinced to support the use of the scorecard since development and implementation of a successful strategy and scorecard could be long and difficult. Even then, management must commit substantial time to maintaining the scorecard. Trade-offs are often necessary to construct measures that do not conflict with each other. Employees must also be committed to achieving objectives. Getting

data and analyzing it in a timely fashion and cost-effective manner can also be challenging. The scorecard must be kept simple, and the addition of new measures entails making decisions about eliminating others (Inamdar & Kaplan, 2002).

Some have criticized the balanced scorecard as a top-down management tool that puts too much emphasis on results without providing solutions (Grant & Proctor, 2011; Wicks, 2007). In a case study of an attempt to save an unidentified financially failing 150-bed teaching non-profit hospital, a balanced scorecard approach was used in an attempt to improve financial stability and save the hospital from closing. Although there was a significant increase in patient satisfaction and employee satisfaction trended slightly upward during 2003 when the BSC approach was used, the hospital eventually failed financially and closed its doors the next year. Factors identified as contributing to the failure of the BSC to save the hospital were the lack of management transparency and leadership support emphasizing the need for effective shared vision communication (Lorden, Coustasse, & Singh, 2008).

Wicks (2007) argues that alternatives, such as the Completing Values Framework (CVF), are available that may be more appropriate for healthcare entities that are service-oriented rather than profit-oriented. The author maintains that the Balanced Scorecard Framework (BSC) "focuses too much on profit and process outcomes and too little on people and the organizational cultures in which they work" (p. 310). The CVF uses four action imperatives instead of perspectives: compete, control, collaborate, and create. The author argues that these imperatives incorporate the perspectives found in the BSC but places more emphasis on the employees' perspectives, encourages collaboration, and emphasizes mentoring to facilitate employee success. However, Grant & Proctor (2011) found that, in their experience of using the balanced scorecard in the wards of the National Health Service (NHS) in Great Britain, arguments against

using the BSC in the measurement and management of quality of healthcare, were not found to have merit. The use of a monitoring system that involved the nurses in developing metrics and engaging the nursing staff in monthly meetings to discuss findings and develop plans to address shortcomings were identified as essential to the success of the BSC at the NHS. At Palomar Pomerado Health in Escondido, California, staff interest and involvement was achieved by displaying the balanced scorecard in an online tool which allowed access, tracking and monitoring of the scorecard at all levels of the organization (Shoemaker & Fischer, 2011).

Discussion

Review of the literature reveals a growing volume of publications that describe the use of balanced scorecards in health care settings, expanding on the original use of the balanced scorecard in industry. Modifications to the original balanced scorecard make it more relevant to the missions and needs of a health care organization. The balanced scorecard cannot be developed until the mission and vision of the organization are formulated. Then a strategy must be developed to achieve the mission and vision. Four processes should be followed to develop and test strategy. These are "translating the vision, communicating and linking, business planning, and feedback and learning" (Kaplan & Norton, 2007, para 5-8). The balanced scorecard framework is used as a tool to translate strategy into perspectives and measurable objectives (Inamdar & Kaplan, 2002).

There is a paucity of literature on the use of the balanced scorecard in student health centers. The only documentation of the use of a balanced scorecard in student health centers was for the Rensselaer University student health clinic (Readdean, 2011). Although financial profitability is not the only goal, these clinics must be sustainable by serving the mission effectively through adherence to a pre-determined budget. The American College Health

Association (ACHA) is the foremost organization for matters related to college and university health. The ACHA's Annual National College Health Assessment (NCHA) data and outreach program evaluations provide valuable information regarding the health habits, behaviors and perceptions of college students (ACHA, 2009). The survey can help provide valuable information for planning health promotion and prevention programs and would be useful in planning a balanced scorecard for the college clinic setting. ACHA's Standards of Practice (ACHA, 2005) recommend that practitioners in student health clinics follow evidence-based approaches to health care and health promotion (Burwell, Dewald, & Grizzell, 2010). Since guidelines for primary care would be used in a student clinic for managing health needs, lessons learned from other organizations via the literature review could be applied to a balanced scorecard for a student health center with priorities for health promotion given to current problems identified in ACHA's Annual National College Health Assessment.

At the Rensselaer clinic, customer satisfaction is measured in several ways including a yearly customer satisfaction survey, measurement of cultural diversity of those using clinic services, monitoring of access to services, and timeliness of appointments. For the internal process perspective, select medical, counseling, preventive and health education processes were tracked and measured. The learning and growth perspective metrics involved peer review, professional continuing education, and adherence to previously developed medical "scenarios" in the EHR. From outcomes data provided in the scorecard, it appears that some of the measures were done at the end of each semester while others were done on a yearly basis. Overall, the scorecard follows the Kaplan & Norton framework closely. There were no more than four objectives in any perspective.

Conclusions

Although documented use of the balanced scorecard framework in the college student health clinic setting is rare in the literature, there is ample literature on the use in other types of healthcare organizations, including service and not-for-profit entities. These case studies and reviews provide information that can guide successful planning, implementation and management. Discussions of challenges and barriers related to the use of a scorecard in the literature can help in avoiding problems that may occur and threaten the success of the scorecard.

The college student health and counseling setting has a unique mission and vision. Since college student health and counseling clinics are usually dependent upon the support and external factors of the larger college or university setting, these must be considered when planning, implementing and managing quality and safety with a scorecard approach. With careful strategic planning and adaptation of the scorecard approach to meet the unique needs and challenges of a college health clinic, the outlook for improving services and outcomes while continuing to be financially sustainable appears to be feasible.

Due to the relatively small size of college and university health clinics as compared to other institutions in the literature that have successfully used the BSC approach, a simplified implementation strategy may be needed to initiate the use of the BSC. (See example, Table 2). For instance, the small college health clinic could start with fewer perspectives or a limited number of objectives. Thorough planning and strategy mapping prior to implementation should involve staff members in all areas to foster commitment from the staff and garner their support in accepting accountability for individual objectives. Planning and strategy mapping should include ensuring a thorough understanding by staff members of the mission and vision of the clinic along with the need to tailor strategy to achieve the mission and vision. The staff should be aware of

the Healthy People 2020 stance on the importance of effective adolescent healthcare in fostering healthy behaviors to reduce the financial burden of preventable health problems and the long-term costs of chronic diseases. Following successful implementation of a simplified approach to the BSC, objectives in the four perspectives could be revised or expanded to allow for a more robust use of the BSC in the future.

Table 1. Integrative Review College Health Balanced Scorecard

Complete Citation	**Sample and Setting**	**Study Design, Purpose, and Methods or Intervention**	**Measured Outcomes, Key Findings**	**Limitations**	**Results/ Implications**
American College Health Association. (2009). American College Health Association - National College Health Assessment II: Reference Group Executive Summary Fall 2009. Retrieved from http://www.acha-ncha.org/docs/ACHA-NCHA_Reference_Group_ExecutiveSummary_Fall2009.pdf	34,208 students at 57 postsecondary schools in the U.S. Average age of students who participated was 22.15 years, median 20.00 years, Std Dev: 6.26 years. 45.4 % were male, 60.7% were female.	Demographic information collected on survey participants. Purpose of study was to assist college health service providers, health educators, counselors, and administrators in collecting data about their students' habits, behaviors, and perceptions on the most prevalent health topics. Surveys were developed following a pilot testing process. Paper surveys were used at 12 of the 57 schools, web surveys were used at 45 of the schools.	Topics surveyed were general health, disease and injury prevention, academic impacts of health, violence, abusive relationships, personal safety, alcohol use, tobacco use, other drug use, sexual behavior, nutrition, exercise, mental health, and sleep.	ACHA-NCHA II not appropriate for trend comparison of items from the original ACHA-NCHA 2008 survey due to survey design between the two studies with a new baseline.	National study, provides largest known comprehensive data set on the health of college students gaining a current profile of health trends with the campus community.
Biro, L. A., Moreland, M. E., & Cowgill, D. E. (2003, May/June). Achieving excellence in veterans' healthcare—a balanced scorecard	U.S. Department of Veterans Affairs Stars and Stripes Healthcare Network with 10	Scorecard was developed as top management tool designed to structure priorities and establish benchmarks. Evolved	Scorecard measures were 1) quality, including prevention and practice guidelines; 2) access in six	Modifications will be needed and weights may need to be adjusted as priorities or	Marked increase in several quality indicators and scores on customer service surveys. Process

approach. *Journal for Healthcare Quality*, *25*(3), 33-39. http://dx.doi.org/10.1111/j.1945-1474.2003.tb01057.x	VA medical centers, 41 community-based clinics, and 12 Veterans Resource Centers providing care to more than 200,000 veterans yearly in Delaware, New York, Ohio, Pennsylvania, and West Virginia.	with input from the CEOs and chiefs of staff of the network's 10 medical centers using information from patients, stakeholders, best practices and industry trends. The network's balanced scorecard was published with the intention that other VA and private-sector hospitals and healthcare systems would be able to emulate it and use it as a benchmark for quality and performance.	clinics; 3) customer satisfaction; 4) staff performance; and 5) financial efficiency for four fiscal years prior to publishing. Discovered that quality and efficiency require the most attention.	availability of resources change.	demonstrated interrelationship of each of the five benchmark areas.
Crabtree, C. W. (2011). Balanced nursing report card. *Computers, Informatics, Nursing*, *29*(11), 613-618. http://dx.doi.org/10.1097/NCN.0b013e31823ba39 Crabtree, C. W. (2011). Balanced nursing report card. *Computers, Informatics, Nursing*, *29*(11), 613-618.	Lexington VA Medical Center Patient Care Units.	Purpose of article was to explain how the Balanced Nursing Report Card (BNRC) was developed at the Lexington VA Medical Center.	Benchmarks were developed, ranges of scores were examined for measurability and formulas were written to show incremental changes at determined segments and were balanced according to the degree to	BNRC process must be dynamic and allow for growth and revision to maintain the usefulness of the report.	The Joint Commission deemed the BNRC to be a best practice. The BNRC helped show the contribution of nurses and highlighted areas of opportunity for improvement.

http://dx.doi.org/10.1097/NCN.0b013e31823ba39			which the metric is affected by direct care delivery. Interdepartmental competition to raise scores led to improvement in hand hygiene and patient safety from the first BNRC to the subsequent reports		
DeBlois, D. (2007, March/April). Using a balanced scorecard to achieve great outcomes. *The Remington Report*, *15*(2), 18-22.	Kno-Wal-Lin Homecare and Hospice, a Medicare-certified and state licensed homecare, hospice, and private duty provider located in Rockland, Maine. Average daily census = 300.	Anecdotal report. Purpose of article was to describe development and implementation of the company's scorecard.	Achievement of superior clinical outcomes and reduction of re-hospitalizations;	The balanced scorecard must be adapted periodically to achieve targets.	Achieved superior clinical outcomes leading to national recognition from the company's information technology company, a Vision Award from a national benchmarking company. Due to success with financial goals, approval was obtained from the parent company to construct a free-

					standing hospice house.
Dugger, C. (2014, October). Balanced scorecard for the medical practice. *AAOS Now*, *8*(10), 29-30.	14 surgeon orthopaedic practice – New England Orthopaedic Surgeons - in Springfield, MA.	Anecdotal report. Purpose of initiative was development of a balanced scorecard for the practice that incorporated four domains: Organizational Knowledge and Learning, Internal Processes, Patient Experience, and Financial	Increased engagement and ownership for the management team and created agreement about what processes and results are important to achieve success.	Selective use of metrics needed to avoid creating a significant burden for practice staff.	The BSC provides a structure that ensures that management maintains a focus on measuring service-related performance with which to evaluate service levels.
Goodspeed, S. W. (2006). Metrics help rural hospitals achieve world-class performance. *Journal for Healthcare Quality*, *28*(5), 28-32. http://dx.doi.org/10.1111/j.1945-1474.2006.tb00628.x	Sample rural hospital with fictitious data.	Purpose of article was to describe the emerging trend of using metrics to achieve world-class performance and financial stability in rural hospitals.	Rural Hospital Balanced Scorecard measures indicators in four areas: Finance, Patient and Health Care Community, Clinical and Business Process, and Learning and Growth.	Rural hospitals often do not have the necessary staff to collect and input data into elaborate data collection systems and may not have the patient volume to justify the collection of certain financial and patient care metrics so they must correctly identify select metrics that will	Metrics aid rural hospital staff in developing actions or initiatives that improve finances, expand core clinical service, make strategic affiliations and improve patient, staff and physician satisfaction. Enables demonstrating clinical

				focus on long term value.	excellence and performance on the CMS core measures.
Grant, L., & Proctor, T. (2011). Measuring quality: How to empower staff to take control. *Nursing Times*, *107*(7), 22-25. Retrieved from http://www.nursingtimes.net/nursing-practice/clinical-zones/management/measuring-quality-how-to-empower-staff-to-take-control/5025982.article	Great Britain National Health Service (NHS)	Purpose of article was to describe using the Balanced Scorecard as a means to measure quality and empower staff to take control of maintaining a high standard of care quality.	Efficiency, patient safety, excellence in care, DSSA compliance (delivering same-sex accommodation, patient experience	Care must be taken to choose indicators that are scientifically sound, measurable, usable and feasible at a reasonable cost. A nursing balanced scorecard must include indicators that reflect evidence that the quality or quantity of nursing substantially contributes to changes measured by the indicators.	The balanced scorecard can assist in monitoring customer satisfaction and can be useful in drawing attention to trends reflecting both good practice as well as undesirable outcomes that merit urgent attention.
Gumbus, A., & Wilson, T. (2004, July/August). Designing and implementing a balanced scorecard: Lessons learned in	Non-profit and government sectors that are mission driven as opposed to	Purpose of article was to address the key issues of design and implementation with a step-by-step guide to how to design a	Alignment of organization's mission, vision, and strategic plan to key measures that	Pitfalls that can put the BSC at risk: 1) members of the senior team not committed to the BSC program;	Improved accountability and follow-up as well as streamlined communication

nonprofit implementation. *Clinical Leadership & Management Review*, *18*(4), 226-232.	financially focused.	balanced scorecard and lessons to avoid problems in governmental and nonprofit settings.	define success for the organization.	2) executives not held accountable for implementing the BSC; 3) the BSC treated as a planning event and not a long-term program	of performance measures.
Hall, L. M., Peterson, J., Baker, G. R., Brown, A. D., Pink, G. H., McKillop, I., ... Pedersen, C. (2007, June 21). Nurse staffing and system integration and change indicators in acute care hospitals: Evidence from a balanced scorecard. *Journal of Nursing Care Quality*, *25*(3), 242-250. http://dx.doi.org/10.1097/01.NCQ.0000310655.60187.92	Data collected from 5 regions in the Ontario area with 34 hospitals in Region 1 (2/3 small rural facilities), 28 hospitals in Region 2 (4 teaching, 14 community, and 10 small settings), 18 hospitals in Region 3 (including 5 teaching and 13 community settings), 22 hospitals in Region 4 (3/4 in community settings), and 17 hospitals in Region 5 (2 teaching, 5	Retrospective, comparative research using secondary data collected for 3 fiscal years, from 2001 to 2003, in Ontario for the Hospital Acute Care series collected by the Hospital Report Research Collaborative.	In all 3 years, "hospital type" was significantly and positively related to nursing care hours. Community hospitals had significantly higher mean patient care hours than small or teaching hospitals. No significant difference existed between mean patient care hours for both small and teaching hospitals. Region in which institutions were located also was positively related to mean patient hours. RN staff hours were influenced by	Further research needed to determine whether other factors, such as absenteeism levels or management styles, have any impact on the nursing financial indicators	The type of hospital, whether teaching, community, or small, has an important role in explaining nursing resource utilization. Regional differences were apparent for overall patient care resource use. Hospital executives may use these findings to identify concepts that have been successful in other settings, enabling them to build the supports

	community and 3 rural sites).		"supports in place for hospital staff" and "hospital type." Direct patient care hours were affected by the hospital's relationship to the community.		provided to hospital staff.
Haworth, J. (2008, June). Measuring performance. *Nursing Management, 15*(3), 22-28. Hoban, M. T., & Ward, R. L. (2003). Building culturally competent college health programs. *Journal of American College Health, 52*(3), 137-141. http://dx.doi.org/10.1080/07448480309595736	Emergency department of Barts and The London NHS Trust. Convenience sample of 43 senior nurses and doctors who work in the ED and the medical and emergency directorate. This sample included four directorate managers, 29 nurses of junior sister grade and above, and ten doctors.	Qualitative study. Questionnaire consisting of 23 open and closed questions including some with Likert scales and were based on the four original BSC domains completed by the sample group with thematic analysis of responses.	Data from questionnaire results and literature support the use of the BSC in emergency care.	Data demonstrates that, to ensure that the idiosyncrasies and organizational objectives of individual EDs are addressed and achieved, the frame- work must be adapted to specific settings.	Balanced scorecard frameworks can be used to measure performance in emergency care settings
Inamdar, N., & Kaplan, R. S. (2002, May/June 2002). Applying the balanced scorecard in	Healthcare executives in nine provider organizations	Qualitative study Executive summary following six question	Adopting the guidelines led to measurable performance	Requires team-based collaborative approach among	Study identified how BSC can become a valuable tool for

healthcare provider organizations. *Journal of Healthcare Management, 47*(3), 179-195.		open-ended verbal survey of nine provider organizations that were implementing the Balanced Scorecard. Knowledge gained from study used to formulate five guidelines for BSC implementation.	improvements, financial results, and customer satisfaction.	disciplines that have not previously worked together.	healthcare executives in managing organizations in a highly complex and uncertain environment.
Jeffs, L., Merkley, J., Richardson, S., Eli, J., & McAllister, M. (2011). Using a nursing balanced scorecard approach to measure and optimize nursing performance. *Nursing Leadership, 24*(1), 47-58. http://dx.doi.org/10.12927/cjnl.2011.22334	Five executives at Bridgepoint Health in Toronto, ON discuss experience in developing a nursing strategic plan and nursing balanced scorecard.	Strategy mapping and focused planning.	Focused planning approach was instrumental in optimizing nursing performance. Unexpected underperformance for reducing stage 2 or greater pressure ulcers.	Quality of decisions made depends on organization's ability to collect data from multiple sources using standardized definitions, mine data and extract them for statistical analysis and effectively present them in a compelling and understandable way to users and decision-makers.	Vital to the success of an organization's strategic plan are ongoing endorsement, engagement and visibility of senior leaders. Data generated from a nursing balanced scorecard offers organizations opportunities to evaluate progress in realizing strategic goals and ensures that key stakeholders

					are engaged in the process.
Kaplan, R. S., & Norton, D. P. (1992). Using the balanced scorecard—measures that drive performance. *Harvard Business Review*, *70*(1), 71-79.	Discussion of several large companies' efforts to improve performance and realize financial gains. Companies discussed include ECI and Milliken.	Development of cohesive BSC based on experiences of several large companies.	New balanced scorecard approach to performance measurement is consistent with initiatives in companies including cross-functional integration, customer-supplier partnerships, global scale, continuous improvement, and team rather than individual accountability.	Disappointing financial measures sometimes occur because companies do not follow up their operational improvements with another round of actions.	The Balanced Scorecard helps managers understand interrelationships and keeps companies moving forward.
Lorden, A., Coustasse, A., & Singh, K. P. (2008, April-June). The balanced scorecard framework—a case study of patient and employee satisfaction: What happens when it does not work as planned? *Health Care Management Review*, *33*(2), 145-155.	150 bed community teaching non-profit hospital. 300-700 respondents to patient surveys per quarter Pre and post intervention study with 12 question	Quantitative research methodology followed a single longitudinal embedded case study design complemented by qualitative participatory research. Statistical analysis: Levene's test for equal variances used to assure comparability among four groupings.	Hospital failed financially and permanently closed its' doors despite statistically significant increases in both outpatient and inpatient satisfaction scores. Employee satisfaction scores overall trended	Hospital was facing significant financial issues. BSC did not address the significant financial issues the hospital was facing indicating poor transparency.	Underscored the importance of strong leadership support, transparency and strength of the BSC.

	survey, 1st phase n=227, 2nd phase n=191.	ANOVA performed to identify any significant change in mean patient satisfaction score for a given time interval. Employee satisfaction evaluated through a 2-question survey	upwards but management employee satisfaction had demonstrated significant decreases.		
Park, E. J., & Huber, D. L. (2007). Balanced scorecards for performance management. *Journal of Nursing Administration, 37*(1), 14-20.	Nursing case management	Non-study article discusses the BSC as a performance management tool to both evaluate and direct case management performance in meeting organizational missions and strategies.	N/A	Balanced view is important; failure to notice interrelationships, decisions in one area may compromise other areas.	Improvements in quality of care and increased financial profits.
Pronovost, P. J., Berenholtz, S. M., & Needham, D. M. (2007). A framework for health care organizations to develop and evaluate a safety scorecard. *Journal of the American Medical Association, 298*(17), 2063-2065.	Safety in health care organizations.	Discusses development of framework to evaluate safety scorecards.	Author developed worksheet to evaluate a Patient Safety Scorecard. 3 main categories with subcategories and questions in worksheet for evaluating a PSC: 1) Is the measure important?	Risk of substantial measurement and selections bias when using the BSC for safety. The science of measuring patient safety is immature.	The need to track patient safety is increasing but must have a plan to improve performance.

http://dx.doi.org/10.1001/jama.298.17.2063			2) Is the measure valid? 3) Can the measure be used to improve safety in the organization.		
Readdean, K. (2011). The balanced scorecard: A quality assurance system for college health. Retrieved from http://www.nyscha.org/files/2011/handouts/FR-6.04%20Balanced%20Scorecard%20Presentation.pdf	Rensselaer University Student Health Center	PowerPoint presentation on developing a BSC for the college health setting	Presentation includes the BSC developed for Rensselaer Student Health Center with references cited to demonstrate evidence-based development of the measures included in the BSC.	Few references available on BSCs specific to college health centers. (Used college health guidelines to develop the BSC including ACHA-NCHA college health survey database.)	Health issues in the college student can affect success in school. Effective measures can help track measures to improve student physical and mental health.
Scanlan, A. (2007, February). Balancing act: Using the clinic scorecard to improve practice performance. *MGMA Connexion*, 34-39.	Medical practice	Purpose of article was to describe implementation of the balanced scorecard as a strategic management system that impels managers to focus on the performance metrics that drive success in improving operational performance and quality of service.	N/A	Leaders must decide which measurements to evaluate and the knowledge gained must be integrated into a closed-loop decision-support process that acts on the information. A medical group must tie the	A successful implementation and use of the balanced scorecard information will serve the entire organization and align everyone with its' mission and goals. The ultimate goal, then, is to improve operational

				performance-management effort to its' daily operations. The performance measurements must have meaning to the owners, the staff and the patients. Planning must be connected to the processes and integrate with all other factors.	performance and quality of service.
Schwartz, J. (2005, October). The balanced scorecard versus total quality management: Which is better for your organization? *Military Medicine*, *170*(10), 855-858.	Health care organizations	Purpose of this non-study article was to present objective comparison of TQM and BSC with advantages/ disadvantages of each method.	N/A	Possible disadvantages – TQM: 1. Lack of long-term commitment and leadership for management; 2. Insufficient empowerment of employees ; 3. Lack of cross-functional, cross-disciplinary efforts; 4. Emphasis on trivial problems ; 5. Lack of focus and training; 6.	No one right answer. If organization is large and bureaucratic, then BSC may be better fit. If an organization is small and service related, TQM may be better fit. With either method, if you if you cannot measure it, you cannot manage it.

				Lack of quality measurement ; 7. Emphasis on quick fixes BSC: 1. Lack of long-term commitment and leadership for management ; 2. Too many/few people involved in planning process; 3. Failure to involve the right people in planning process; 4. Too many/few metrics ; 5. Developing unattainable metrics; 6. Lack of employment awareness ; 7. Use as a punitive device.	
Shoemaker, L. K., & Fischer, B. (2011). Creating a nursing strategic planning framework based on evidence. *Nursing*	California public health care system, Palomar Pomerado Health (PPH) comprised of Palomar	Article describes evidence-informed strategic planning process and framework used by PPH.	Magnet-recognized system. Collaborative leadership structure.	Requires frequent monitoring of the initiatives.	Must involve nurses at all levels of the organization to be successful with a

Clinics of North America, *46*, 11-25. http://dx.doi.org/10.1016/j.cnur.2010.10.007	Medical Center (tertiary medical center), Level II trauma center, Pomerado Hospital (community hospital), part skilled nursing facilities, home care division, ambulatory surgery center, outpatient behavioral medicine center, outpatient women's pavilion and 2 retail health clinics.				framework that has multiple facets and incorporates multiple initiatives.
Voelker, K. E., Rakich, J. S., & French, G. R. (2001, Summer). The balanced scorecard in healthcare organizations: A performance measurement and strategic planning methodology. *Hospital Topics*, *79*(3), 13-24.	For profit and not-for-profit healthcare organizations.	Article discusses BSC in healthcare organizations and compares the four balanced perspectives included in the scorecard for for-profit versus not-for profit health organizations.	N/A	Complex; requires long-term commitment. Some estimates suggest a 70 percent failure rate for scorecard implementations.	Managers who are considering adopting a BSC for their organizations should research the topic thoroughly and, above all, know what they hope to achieve before they start the project.

Wicks, A. M. (2007, September/October). Competing values in healthcare: Balancing the (un)balanced scorecard...including commentary by Kinney CS. *Journal of Healthcare Management, 52*(5), 309-324.	Healthcare organizations.	Executive Summary. Discusses the BSC and introduces CVF as an alternative.	CVF encourages collaboration. It is based on tensions between different organizational loci. It helps to clarify how changes in one part of the system will affect other parts. The CVF incorporates all of the perspectives found in the BSC approach and places greater emphasis on the importance of people relative to profits and processes.	The BSC does not specifically include the employees' perspective, despite the fact that Kaplan and Norton included having a "motivated and prepared" workforce as an underpinning of the framework. The BSC only provides measures of actual organizational outcomes and offers no clear guidance on how to improve those outcomes.	Authors suggest using CVF either on its' own or as complement to existing BSC systems.

Zelman, W. N., Pink, G. H., & Matthias, C. B. (2003). Use of the balanced scorecard in health care. *Journal of Healthcare Finance*, *29*(4), 1-16.	Variety of health care organizations.	Purpose of article is to review the use of the balanced scorecard in health care and draw some conclusions about its' use.	BSC relevant to healthcare but modification needed. Recent innovations focus on improvement of the application of the scorecard through measurement and evaluation.	Adoption of a BSC increases the need for valid, comprehensive and timely information.	The BSC should be adapted to the specific needs of each individual healthcare entity.

Figure 1. Strategy Map

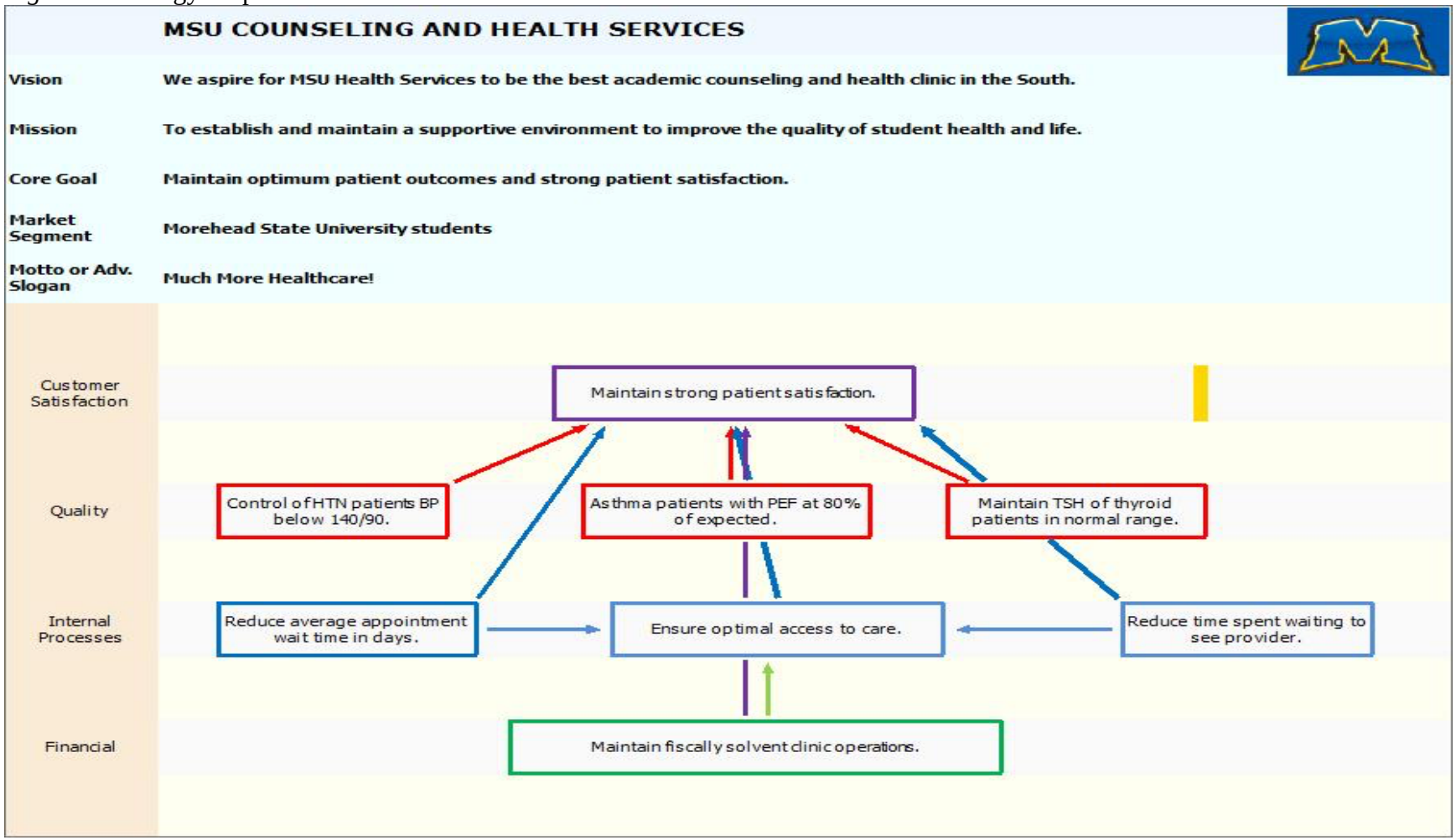

Table 2. Simplified College Health Balanced Scorecard

Framework Elements	Strategic Measures	Data Definitions	Data Source
Customer Satisfaction	Patient satisfaction	• Ratings on par with other institutions of higher education.	• ACHA-PSAS with Reference Group for benchmarking.
Quality	Improve disease specific health outcomes: • Hypertension • Asthma • Thyroid disease	• Percent of patients with diagnosis of HTN with control of BP below primary HTN levels in 3-month period. • Percent of patients seen in clinic with peak expiratory flow levels at 80% or greater prior to discharge from clinic in 3-month period. • Percent of patients with thyroid disease with TSH in normal range in 3-month period.	• Manual chart review of patients with HTN diagnoses in EHR in 3-month period. • Manual chart review of patients with asthma diagnoses in EHR in 3-month period. • Manual chart review of patients with thyroid disease diagnoses in EHR in 3-month period.
Internal Business Processes	Access to Care	• Average appointment wait time in days during 6-month period. • Time spent in clinic waiting from time of entry to seeing provider during 6-month period.	• Log maintained by intake clerk with date of request and date appointment time granted • Appointment time study reports in EHR.
Financial	Fiscally solvent clinic operations	• Operations within budget for 3 month period – funds received = or > than expenses.	• Financial records audit of profits and expenses for 3-month period with profits.

Manuscript Two

Hypertension Management Protocol for Student Patients in a University Clinic Setting

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Scope and Purpose

Following evidence-based high quality guidelines with consistent recommendations can potentially decrease the use of inappropriate and unnecessary care, and can save both lives and money (Keyhani, Kim, Mann, & Korenstein, 2011). Often there are contradictory guidelines available for specific health problems. Since there is no central authority responsible for approving guidelines for use in the United States, it is important for health care clinics to evaluate the various guidelines available for applicability to a particular clinic, flexibility, clarity and validity.

Available multidisciplinary personnel should be included in selecting appropriate guidelines for development of a protocol and for developing clinic specific protocols. Once guidelines have been selected for use in developing a protocol, it becomes important to tailor the protocol to the specific expertise of a facility's personnel, the typical patient population and the new evidence and maintain validity of the protocols (Cooke & Gould, 2013). Providers should also keep in mind that there might be situations in which clinical judgment may require modification of treatment in a way that does not strictly follow the guidelines (Davis, 2015). Considerations for modification may be necessary to include patient preferences, to account for tolerability of medication, and to control cost (Davis, 2015). The purpose of this paper is to Heal

Background and Significance of the Problem

Long-term health consequences of hypertension include an increased risk of myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately. Factors contributing to hypertension include smoking, obesity, lack of physical activity, and high salt intake in the diet, excessive alcohol consumption, older age, and genetics. According to The Eighth Joint National Committee on Hypertension (JNC 8; James et al., 2014), for patients under

sixty years of age, approaches should include initiating lifestyle interventions and prescribing appropriate antihypertensive medication when systolic diastolic blood pressure is consistently ≥ 140 mm Hg or diastolic blood pressure is ≥ 90 mm Hg. Medication choice should be based on factors such as severity of hypertensive state, age, race, and co-morbidities. According to Healthy People 2020, much of the financial burden of preventable health problems and the long-term costs of chronic diseases can be attributed to behaviors begun during adolescence lending increased importance to detecting and managing hypertension in the college aged population (Healthy People 2020). Lifestyle modification to develop healthy behaviors in the young adult years is an important factor in preventing chronic disease (Freudenberg et al., 2013).

According to Sood, Rinehart, & Baker (2010), it is estimated that one in three Americans have hypertension at an approximate cost of $69.4 billion in the year 2008 (p. 885). It is also estimated that about half of patients who have been diagnosed with hypertension do not reach goals for blood pressure as a result of not taking medications as prescribed and not making recommended lifestyle modifications. Per NCHS data, the South has the highest rates of hypertension in the United States (Schlomann, Virgin, Schmitke, & Patros, 2011). A qualitative study by Schlomann et al., conducted in a rural Southern Appalachian non-profit Nurse Practitioner-run clinic in Kentucky, identified several factors that contributed to hypertension in patients treated at the clinic. These included competing life demands and other factors that affect successful management of hypertension, such as stress, economic struggles, difficult life circumstances, family history, side effects of medications, forgetfulness, dislike of taking medications, negative experiences with the healthcare system and inadequate resources. Adis Medical Writers (2013) noted a high correlation between obesity and hypertension in younger patients, thought to be due to insulin resistance and activation of the sympathetic nervous system

and the renin-angiotensin system along with a higher incidence of co-morbidities that must be taken into account when prescribing antihypertensive medications. Another factor that should be considered is that high blood pressure occurs at earlier ages, more frequently and with increased severity in African Americans as compared to Caucasians (National Heart and Lung Institute, 2011).

Review of Available Guidelines for Management of Hypertension

Available guidelines for the management of hypertension include the Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) for the management of high blood pressure in adults (James et al., 2014), the American Heart Association / American College of Cardiology (AHA/ACC/CDC) guideline, and the U.S. Preventive Services Task Force. The American Society of Hypertension published a guideline on hypertension in 2013 jointly with the International Society of Hypertension (ISH/ASH). In 2007, the World Health Organization (WHO) jointly released, with the International Society of Hypertension, comprehensive recommendations for the prevention of cardiovascular disease and guidelines for the management of cardiovascular risk in 2007, but WHO has not published an update since then either independently or in conjunction with another organization.

JNC 8

The Joint National Committee published its' eighth and latest report in 2014 and addressed evidence of benefits of initiating an antihypertensive at specific thresholds and whether this improved outcomes. The committee also addressed the comparative benefits versus risks of various antihypertensives on long-term outcomes. While the seventh report recommended separate treatments for patients with comorbid conditions, the eighth report

simplified the recommendations making similar recommendations for all groups and reduced the number of medications recommended for initial treatment from 5 to 4 medications.

The JNC 8 Evidence-Based Guidelines for the Management of High Blood Pressure in Adults state that hypertension is "the most common condition seen in primary care and leads to myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately" (James et al., 2014, p. 507). JNC 8 recommends a systolic blood pressure goal of ≤ 140 mmHg., and a diastolic blood pressure goal of ≤ 90 mm Hg. for those under the age of 60 or adults of any age with diabetes or chronic kidney disease. For initial drug treatment in non-African-Americans, the committee recommends an angiotensin-converting enzyme inhibitor (ACE1), angiotensin receptor blocker (ARB), calcium channel blocker, or a thiazide-type diuretic (James et al., 2014). For African-Americans, a calcium channel blocker or thiazide-type diuretic is recommended for initial drug therapy (James et al., 2014). For optimal cardiovascular health, especially for those already at increased risk, the American Heart Association also recommends screening fasting lipids, body mass index (BMI), blood glucose, smoking, physical activity, and diet with lifestyle style modifications to manage these risk factors (American Heart Association [AHA], 2014).

AHA/ACC/CDC

The science advisory from the American Heart Association, the American College of Cardiology, and the Centers for Disease Control, on control of hypertension, published in 2013, recommends the use of an algorithm for diagnosis and management. For Stage I hypertension, which is a systolic blood pressure of 140-159 or a diastolic blood pressure of 90-99, a trial of lifestyle modification is recommended as the first step, while consideration can be given to adding a thiazide. Re-check is recommended in 3 months. If BP is not at goal, a thiazide,

ACE1, ARB, CCB, or combo is recommended. For Stage II hypertension, a systolic BP of 160 or greater, or a diastolic BP greater than 100, lifestyle modification plus 2 drugs is preferred. The same 4 drugs used for Stage I are to be used, but in combination.

USPSTF

The U.S. Preventive Services Task Force (2015), recommends ambulatory and home monitoring of blood pressures, over a 12-24-hour period, to confirm the diagnosis of hypertension following screening in the clinic unless the patient has a very high blood pressure or clinical signs of organ damage. There was evidence that elevated home systolic blood pressures are predictive of an increased risk of cardiovascular disease. Fewer patients require treatment when this method is employed. The USPSTF recommends a thiazide diuretic, ACE1 or calcium channel blocker for initial treatment in non-black patients. In black patients, either a thiazide diuretic or calcium channel blocker should be initiated. Contrary to other guidelines, the USPTF concluded that there is insufficient evidence for blood pressure screening in adults under the age of 39 but believes there is indirect evidence of the need for screening beginning at age 18. At age 40 yearly screening should begin. The exception to this recommendation is in obese and African American patients due to an increased risk of hypertension in these patients.

ISH/ASH

The American Society of Hypertension and the International Society of Hypertension released a joint hypertension guideline in 2014 (Weber et al., 2014). Recommendations for BP parameters for diagnosis are similar to the other guidelines. A major difference in this guideline is the recommendation for blood tests on the same day as diagnosis if possible. Blood tests that are recommended include electrolytes, fasting glucose, serum creatinine, lipids, hemoglobin/hematocrit, and liver function. A urinalysis is recommended to look for red cells,

white cells, and microalbumin. An EKG is also advised. Treatment follows an algorithm that is nearly identical to the one advised by the AHA/ACC/CDC.

ACHA and Healthy Campus 2020

Morehead State University is a member institution of The American College Health Association (ACHA). The mission of the ACHA is to promote the health and well-being of students at universities and colleges in the United States. More than 800 institutions of higher learning participate in the ACHA, and there are over 2800 individual members consisting of health care professionals at member institutions.

Healthy People, an initiative of the U.S. Department of Health and Human Services, establishes goals and objectives for disease prevention and promoting the health of the nation. Healthy People 2020 objectives are grouped into various categories, including one for encouraging healthy behaviors in adolescents. This category includes recommendations for adolescents aged 10 to 19 and young adults aged 20 to 24. The ACHA develops objectives specific to college students, aptly named Healthy Campus. Student objectives for Healthy Campus 2020 address health impediments to academic performance, health communication, injury and violence prevention, mental health, nutrition and maintenance of healthy weight, physical activity and fitness, sexually transmitted diseases and HIV, family planning, substance abuse, tobacco abuse, and immunization and infectious disease. College-age students with hypertension often are overweight or obese, do not have optimal nutrition, and do not exercise regularly. Other problems that may exacerbate hypertension in this age group include co-morbid conditions such as metabolic syndrome, elevated lipids, substance abuse and tobacco abuse (American College Health Association [ACHA], n.d.). Managing hypertension must necessarily include these issues.

Protocol Development

Conceptual Perspective

The Academic Center for Evidence-Based Practice Star Model (ACE) (See Figure 1) defines strategies for translating evidence-based knowledge into healthcare practice (Schaffer, Sandau, & Diedrick, 2013; Stevens, 2012). In this model there are five steps:

> (1) discovery of new knowledge; (2) summary of the evidence following a rigorous review process; (3) translation of the evidence for clinical practice; (4) integration of the recommended change into practice; and (5) evaluation of the impact of the practice change for its contribution to quality improvement in health care (Schaffer et al., 2013, p. 1200; Stevens, 2012).

There may be delays when implementing evidence-based evidence into clinical practice (Irwin, Bergman, & Richards, 2013). According to Fineout-Overholt, Melnyk, and Schultz, gaps and delays are more often due to external factors that influence implementation than professionals' knowledge and skills (Irwin et al., 2013; Fineout-Overholt, Melnyk, & Schultz, 2005). Support from managers is an important factor is an important factor in implementing evidence-based practice, especially in providing time for facilitating implementation and mentors (Irwin et al., 2013; Fineout-Overholt & Melnyk, 2011).

Process of Developing the Protocol

According to Adams & McCarthy, the components of an evidence-based guideline should include a purpose statement, definitions of key terms, a statement of individuals at risk, an assessment of the patients who are most likely to benefit from the guideline, a description of the practice or procedure, and a description of process and outcome variables that will be used to evaluate changes that occur in a practice after instituting a new guideline, and references (2007).

It also important to take into consideration the characteristics and needs of the institution where the protocol will be used, the typical patient population, and personnel when developing the protocol. Specific recommendations should be made for key personnel who will use the guideline defining their role in implementing and using the protocol (Adams & McCarthy, 2007).

Following the ACE model, the first step is to research to identify applicable research related to hypertension management (Schaffer et al., 2013; (Stevens, 2012). Since a multidisciplinary team is ideal for developing protocols, staff should be selected from the various disciplines available in the clinic. In the MSU clinic situation, this would mean having both practitioners and nurses on the team since these two groups will be using the protocol for hypertension management. These individuals should meet as a group to work on the hypertension management protocol. At the first meeting, it is important to develop a consensus of opinion regarding the needs of the patient population, including the number of patients we believe may be at risk. We should consider risk factors and co-morbid conditions, including obesity. In a university health clinic, the needs may differ from the needs of other populations. The stress of school life is important to consider as a protocol is developed. Following this meeting, each of the team members should search for guidelines for review for the second meeting.

The purpose of a second meeting, following step 2 of the ACE model, is to review the evidence and summarize the findings. Next, according to step 3 of the ACE model, we should decide on elements to be included in the protocol while continuing to consider the needs of clinic and our student patients (Schaffer et al., 2013; Stevens, 2012). Consideration should be given to interventions that are practical and whether the protocol might be difficult to implement, result in

changes in service delivery, or require the development of new skills (Hill, Bullock, & Alderson, 2011). Agreement should be reached as to which guidelines, or strategies, best match the needs of the patients, and the resources and personnel available in the clinic. Following the creation of the protocol, the team should discuss each item in the protocol to see if revisions need to be made to the protocol before it is finalized and put into practice. The fourth step of the ACE model is to implement the protocol (Schaffer et al., 2013; Stevens, 2012). After the protocol is finalized, it should be presented to all personnel in a staff meeting to raise awareness of the roles of clinic personnel in implementing the protocol. Since the MSU clinic utilizes an EMR, which has the capability of using templates, the practitioners should develop templates to ensure that components of the protocol are followed and charted. The protocol developed for MSU's health clinic is shown in Table 1.

Using the ACE Model to Evaluate

Step 5 of the ACE model requires an evaluation of the impact of the protocol for quality improvement (Schaffer et al., 2013; Stevens, 2012). Chart audits should be done to determine the level of compliance with the protocol, and patient outcomes should be evaluated. Reasons for this are multifactorial including not only an evaluation of compliance and outcomes, but also the efficiency of the protocol as written, and an assessment of what works and what doesn't so that changes can be implemented to improve the protocol.

Once the results of the chart audit are available, staff members should be apprised of the results. Based on the results and suggestions from staff members, needed changes should be made in the protocol or in the manner of implementation. Long-term sustainability of the protocol depends on periodic review and making changes that will improve the protocol to ensure the desired end results.

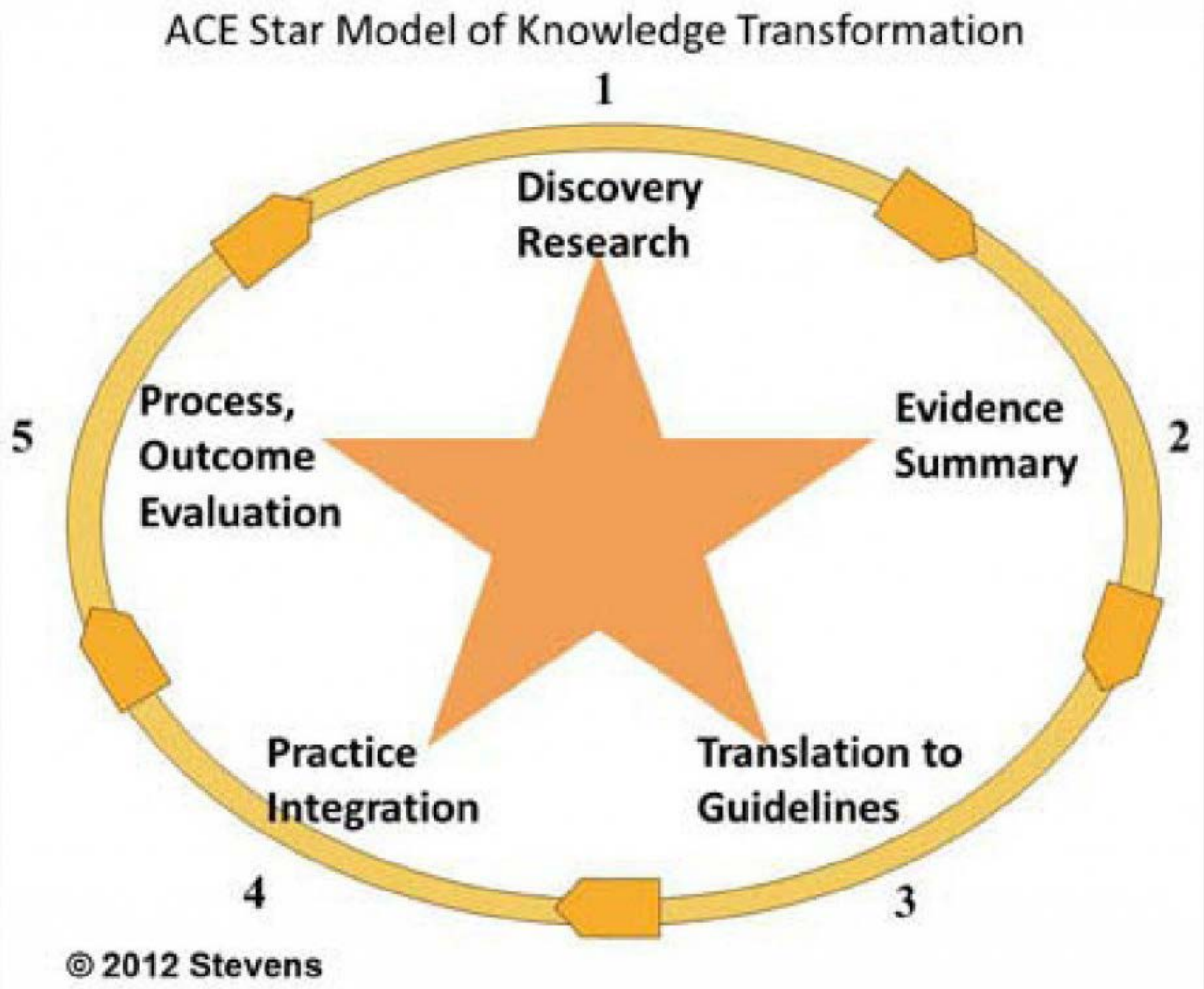
Discussion

When managing hypertension in college-age students, it is important to remember that these students want to be well-informed about their condition and management. Good communication between the provider and the patient can have a significant impact on compliance and success of treatment. Most students would also like to be involved in their care and in decision-making regarding treatment alternatives (Campbell, Auerbach, & Kiesler, 2007). Providers should be familiar with available resources, build supportive and collaborative relationships that are culturally appropriate, and solicit feedback from patients to improve outcomes (Hoban & Ward, 2003). According to the IOM's *Crossing the Quality Chasm*, quality care should be safe, effective patient-centered, timely, efficient, and equitable (Institute of Medicine, 2001; National Committee for Quality Assurance [NCQA], 2007). Information technology has the potential to significantly improve the quality of health care. Automation of reminders, electronic prescribing and pre-determined templates for care, along with technology to assist with diagnosis and management, can provide a significant impact on the improvement of quality ((Institute of Medicine, 2001).

Risk factors for high blood pressure include age, race/ethnicity, obesity, gender, lifestyle habits, and family history (National Heart and Lung Institute [NHLBI], 2015). Hypertension is common modifiable condition (Scordo & Pickett, 2014). Patients should be educated about the benefits of salt reduction, exercise, alcohol consumption, and cigarette smoking (Scordo & Pickett, 2015). Life expectancy of Americans is low compared to many other developed, high-income countries in the world, and Americans have relatively higher rates of chronic disease and disability (Ho, 2013). Reducing rates of chronic disease at younger ages may improve lifelong health and improve mortality (Ho, 2013). Chronic health problems develop over time.

Modifiable behaviors such as smoking, obesity, sub-optimal nutrition, and lack of exercise and physical fitness are examples of unhealthy behaviors that contribute to chronic illness. In order to affect long-term outcomes, social, environmental, and financial factors must be taken into consideration when encouraging behavior modification (Ho, 2013).

Figure 1. The Academic Center for Evidence-Based Practice Star Model (ACE)



Note. From "Stevens, K. R. (2012). *Star model of EBP: Knowledge transformation*. Academic Center for Evidence-based Practice. The University of Texas Health Science Center at San Antonio. Retrieved from http://www.aahs.org/aamcnursing/?page_id=745

Table 1. Morehead State University Health Clinic Protocol for Management of Hypertension

MSU Counseling & Health Services Protocol	
Revision: 1	Prepared by Kathleen Solter APRN
Effective Date:	December 1, 2014
MANAGEMENT OF HYPERTENSION	
Policy/Procedure:	To ensure evidence-based management of hypertension and use of consistent management and treatment guidelines among providers.
Purpose:	To provide the steps for diagnosis, treatment and management of elevated blood pressures for clinic patients.
Scope:	This procedure applies to all clinic health services nurses and prescribing healthcare providers.
Responsibilities:	Nurse admitting patient to exam room is responsible for taking vital signs, recording current medications and medication allergies, determining patient's preferred pharmacy, and recording patient statement of purpose of visit. Provider is responsible for viewing vital signs and determining if blood pressure is within normal limits. For blood pressures outside of normal range, provider will determine course of management based on clinic procedure.
Policy and Procedure:	Management of Elevated Blood Pressure or Hypertension in Adults < 60 years of age.
Definition:	Essential hypertension has no identifiable etiology but is likely due to multiple factors. To be diagnosed as hypertension, blood pressure remains elevated, if not treated.
Risk Factors:	• Obesity

<table>
<tr><td></td><td>

Diet high in sodium and fat and low in potassium
Excessive alcohol intake
Ethnicity – Non-Hispanic blacks have highest incidence and prevalence.
Family history of hypertension.
Smoking
Physical inactivity
Oral contraceptive use

</td></tr>
<tr><td>Classification of adult blood pressure</td><td>
<table>
<tr><th>Category</th><th>Systolic (mm Hg)</th><th></th><th>Diastolic (mm Hg)</th></tr>
<tr><td>Normal</td><td><120</td><td>and</td><td><80</td></tr>
<tr><td>Pre-hypertension</td><td>120-139</td><td>or</td><td>80-89</td></tr>
<tr><td>Stage 1 hypertension</td><td>140-159</td><td>or</td><td>90-99</td></tr>
<tr><td>Stage 2 hypertension</td><td>≥ 160</td><td>or</td><td>≥ 100</td></tr>
</table>

* Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.
</td></tr>
<tr><td>Intake:</td><td>Nurse admitting patient to exam room will obtain and record vital signs, medication list, medication allergies, and pharmacy of choice. If initial systolic BP is ≥ 140 or diastolic BP is ≥ 90, nurse will re-take BP with manual cuff after patient is sitting for 5 minutes.</td></tr>
<tr><td>History:</td><td>

Provider will ask about history of elevated BPs; if treated previously, ask about successes/failures of treatment or adverse effects of previous medications.
Question about symptoms of stress and history cardiovascular disease, renal disease, diabetes, or dyslipidemia.
Inquire about weight control, physical activities, tobacco use, and alcohol use.
Ask about family history of hypertension, diabetes, renal disease, and dyslipidemia.
Review medication history, including illicit drugs and drugs that may elevate BP including NSAIDs, decongestants, and appetite suppressants.

</td></tr>
</table>

Physical Exam:	• Perform a complete heart and lung exam. Include other systems as indicated by history.
Diagnosis	• Diagnose with hypertension if systolic BP ≥ 140 or diastolic BP ≥ 90 on three blood pressures in at least 2 separate visits on different days.
Tests:	• Consider lab tests prior to initiation of medication. If lab tests not done prior to initiation of medication, lab tests should be done within 6 weeks of initiating treatment to include: Fasting lipid panel, CBC, BMP or CMP. Lab work should be repeated yearly thereafter.
Lifestyle Modification	• Recommend weight loss for those with BMI ≥ 30. • Recommend no-added salt diet. • Recommend daily aerobic exercise for 30 minutes daily at least 5 days per week. • Recommend consumption of a diet high in fruits and vegetables and low in saturated fats (limit intake of red meats, avoid fast foods and fried foods). • Recommend smoking cessation if patient is a smoker. • Recommend limiting consumption of alcohol. • For those patients who prefer trying lifestyle modifications first, in lieu of medication, allow 6-month trial before initiating medication.
Initiation of Medication*:	• Initiate pharmacologic treatment to lower BP at DBP ≥90 mm Hg and treat to a goal DBP <90 mm Hg. • Initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg and treat to a goal SBP <140 mm Hg. • In presence of chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to goal SBP <140 mm Hg and goal DBP <90 mm Hg. • In the presence of diabetes, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to a goal SBP <140 mm Hg and goal DBP <90 mm Hg. * Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.

Medication*:	• In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). • In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB. • In the population aged ≥18 years with CKD, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. Applies to all CKD patients with hypertension regardless of race or diabetes status. • If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug - thiazide-type diuretic, CCB, ACEI, or ARB. • If goal BP cannot be reached with 2 drugs, add and titrate a third drug - thiazide-type diuretic, CCB, ACEI, or ARB. • Do not use an ACEI and an ARB together in the same patient. • If goal BP cannot be reached using only the four drugs recommended because of a contraindication or the need to use more than 3 drugs to reach goal BP, antihypertensive drugs from other classes can be used. Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed. * Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.
Follow-up:	• After initiating medication, follow-up visit should be scheduled with patient within 6 weeks of initiating treatment for first stage hypertension, in 1-2 weeks for second stage hypertension. • Schedule subsequent follow-up visits every 6 months.

Manuscript Three

Management of Hypertension in Student Patients in a University Student Clinic

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University of Kentucky

College of Nursing

Abstract

Purpose: To evaluate provider adherence to a clinical guideline for management of hypertension, and to assess improvement in quality of management of student patients with hypertension in a university student clinic.

Methods: A retrospective chart review was conducted to identify student patients with hypertension. Data collected included the demographics of the sample patients, blood pressures, LDL results, weights, and evidence of provider compliance with guidelines.

Results: Of the 13 patient charts audited, providers recommended exercise to 46.15% of patients, weight loss or maintenance to 53.85% of patients, no-added salt diets to 53.85% of patients, low fat to 23.08% of patients, fruits and vegetables to 23.08% of patients, and alcohol moderation to 15.38% of patients. There were no smokers in the sample. Measured outcomes were: LDLs $\leq$ 130 in 15.38% of patients, achievement of a 5% weight loss if BMI $\geq$ 25 in 7.69% of patients, weight maintenance if BMI < 25 in 15.38% of patients. A systolic BP of <140 was achieved in 69.23% of patients, and a diastolic BP of < 90 was achieved in 69.23% of patients.

Conclusion: Outcomes were mixed. Blood pressures improved in more than half of the patients, 7.69% met weight goals. LDLs were recommended for 61.54% of patients but were done in only 23.08% of patients. 61.54% of patients were treated with a preferred ACE1, 7.69% with ACE1/thiazide, 23.08% with a thiazide alone, 7.69% with no antihypertensive. Improvements were made in quality of hypertension management, but further improvement is needed.

Introduction

With the increasing complexity of healthcare in recent years, a quality management program is increasingly being seen as a necessity even for smaller clinics and medical practices. Many healthcare entities have turned to frameworks to assist in improving quality and safety while increasing profits to ensure financial survival. One such framework is the Balanced Scorecard, which was developed by Kaplan and Norton in the early 1990's (Kaplan & Norton, 1992). This tool was first developed to help industry businesses improve efficiency, relationships with stakeholders and business partners, customer satisfaction and profits while aligning business strategy with the mission and vision of the organization. Kaplan and Norton identified four key perspectives that should be tracked to ensure success. These four perspectives are the "financial, customer, internal process and innovation, and organizational learning perspectives" (Kaplan & Norton, 1992, p. 79). The healthcare industry eventually realized that this same tool could be used to manage complex perspectives that are more applicable to health care organizations, with "quality of care, outcomes and access" perspectives often being added to scorecards (Zelman, Pink & Matthias, 2003, p.7).

At Morehead State University Student Counseling and Health Services there is a recognized a need to introduce quality control measures for our student patient population. Our long-term goal is to develop a balanced scorecard to monitor and improve quality and safety. A balanced scorecard is a substantial undertaking that requires a considerable investment of time, careful strategic planning, and long-term commitment to be successful. Due to time constraints, the purpose of this proposed project is to begin the creation of the scorecard by developing objectives to improve quality of care and outcomes for our hypertensive patients. The

scorecard will be a future goal and will not be the immediate focus of this practice inquiry project.

Background

The Eighth Joint National Committee's Evidence-Based Guideline for the Management of High Blood Pressure in Adults (JNC 8) states that hypertension is "the most common condition seen in primary care" (James et al., 2014, p. 507). Hypertension is defined as a systolic blood pressure ≥ 140 mm Hg. or a diastolic blood pressure of ≥ 90 mg Hg (James et al., 2014). The long-term health consequences of hypertension include increased risks of myocardial infarction, congestive heart failure, stroke, renal failure, and death if not detected early and treated appropriately. Factors contributing to hypertension include smoking, obesity, high salt intake, excessive alcohol consumption, older age, genetics, and lack of physical activity (National Heart and Lung Institute [NHLBI], 2011; James et al., 2014; Egan, Zhao, & Axon, 2010; Olives, Myerson, Mokdad, Murray, & Lim, 2013; Mozaffarian et al., 2015).

Adis Medical Writers (2013) noted a high correlation between obesity and hypertension in younger patients, thought to be due to insulin resistance and activation of the sympathetic nervous system and the renin-angiotensin system. This, along with a higher incidence of co-morbidities, must be taken into account when prescribing antihypertensive medications. Unhealthy dietary choices and physical inactivity are among the factors contributing to obesity among college students (Kelly, Mazzeo, & Bean, 2013). The diets of college students typically include fast foods that are high in calories, fat, and sodium content due to the easy access of fast foods and the higher cost of healthier alternatives (Cluskey & Grobe, 2009). Also, during the college years, students have increased independence and challenges, and for many students priorities may not include diet and physical activity (Laska, Pasch, Lust, Story, & Ehlinger,

2009). Stress levels may also contribute to weight gain as students have demanding schedules and lack of time and experience in balancing priorities (Jackson, Berry, & Kennedy, 2009; Rao, Lozano, & Taani, 2014). As reported by Healthy People 2020 (n.d.), much of the financial burden of preventable health problems and the long-term costs of chronic diseases can be attributed to behaviors begun during adolescence lending increased importance to detecting and managing hypertension in the college aged population. This age group is "a critical time during which many individuals establish independence and adopt lasting health behavior patterns" (Laska, Pasch, Lust, Story, & Ehlinger, 2009, p. 376). In the United States, the incidence of hypertension in adults aged 18 and older is 29%, nearly a third of all adults (U. S. Department of Health and Human Services Health Resources and Services Administration [HRSA], n.d.). In the state of Kentucky 39.1 % of adults have hypertension. Kentucky ranked 5th among the states in 2015 for prevalence of hypertension (Trust for American's Health, 2016).

Analysis of results from the National Longitudinal Study of Adolescent Health (Add Health), funded by the National Institutes of Health (NIH) and published in 2011, indicated that 19% of adult men and women aged 24-32 years may have high blood pressure (National Institute of Child Health and Development [NICHD], 2011; University of North Carolina at Chapel Hill [UNC], 2011). African Americans have a higher prevalence of hypertension than whites or Hispanics at 41%. In African Americans, hypertension occurs at earlier ages, more frequently, and with increased severity (NHLBI, 2011). By comparison, the prevalence in whites is 28% and the prevalence in Hispanics is 22% (Centers for Disease Control and Prevention [CDC], 2015; Mozaffarian et al., 2015). Sood, Rinehart, and Baker (2010) stated that in 2008 the approximate cost of hypertension to the health care system was $69.4 billion.

Hypertension, with proper management, is a modifiable risk factor for heart disease.

According to JNC 8, for patients under sixty years of age, approaches should include initiating lifestyle interventions and prescribing appropriate antihypertensive medication when systolic diastolic blood pressure is consistently ≥ 140 mg Hg or diastolic blood pressure is ≥ 90 mm Hg. (James et al., 2014). Lifestyle modifications should include improvements in nutrition, weight loss, aerobic exercise, smoking cessation, limited alcohol intake, and stress reduction (Davison, 2015; Mozaffarian et al., 2015; James et al., 2014). For optimal cardiovascular health, especially for those already at increased risk, the American Heart Association also recommends screening fasting lipids, body mass index (BMI), blood glucose, smoking, physical activity, and diet with lifestyle style modifications to manage these risk factors (American Heart Association [AHA], 2014). Patients should be included in decision-making and providers should support them in self-management (Davison, 2015).

Medication choice should be based on factors such as severity of hypertensive state, age, race, and co-morbidities (James et al., 2014). For most patients, an ACE inhibitor is an excellent first-line choice of medication. For initial drug treatment in non-African Americans, the committee recommends an angiotensin-converting enzyme inhibitor, angiotensin receptor blocker, calcium channel blocker, or thiazide-type diuretic. For African Americans, a calcium channel blocker or thiazide-type diuretic is recommended for initial drug therapy (James et al., 2014, p. 507).

It is estimated that about half of patients who have been diagnosed with hypertension do not reach goals for blood pressure as a result of not taking medications as prescribed and not making recommended lifestyle modifications (Willard-Grace et al., 2015). Data from the National Center for Health Statistics (NCHS) reveal that southeastern states have the highest rates of hypertension in the United States (Schlomann, Virgin, Schmitke, & Patros, 2011;

(NCHS, 2014). A qualitative study by Schlomann et al. conducted in a rural Southern Appalachian non-profit NP run clinic in Kentucky identified competing life demands and other factors that affect successful management of hypertension including stress, economic struggles, difficult life circumstances, family history, side effects of medications, forgetfulness, dislike of taking medications, negative experiences with the healthcare system and inadequate resources, (2015).

Purpose

The purpose of this practice inquiry project was to improve the management, quality of care, and outcomes for the clinic's student patients who have a diagnosis of hypertension.

Project Objectives:

- To assess the prevalence of elevated blood pressure in college students seeking care in the MSU student clinic,
- To implement clinic guidelines for treatment and management based on JNC 8 guidelines to reach a goal of maintaining the diastolic blood pressure of 75 percent of the hypertensive patients in the clinic at a systolic pressure of less than 140 mm Hg and diastolic pressure of less than 90 mm Hg.,
- To evaluate provider compliance with clinic hypertension protocol, and
- To evaluate outcomes including assessing for improvements in blood pressure, lipid values and weight.

Conceptual Perspective

The conceptual framework chosen to guide this project was Donabedian's model (see Figure 1), which provides a framework for evaluating quality of care and improving the outcomes of health services. The Donabedian model asserts that the interaction of structure and processes

lead to outcomes. Donabedian's model provides a framework to guide practice and research and facilitating quality care to improve outcomes (Donabedian, 2005). Structures may include the clinic layout, supplies and equipment, staffing, the electronic medical records system, protocols, leadership support, and the financial status and budget (Smitz Naranjo & Kaimal, 2011). While Donabedian stated that outcomes are validators of the effectiveness and quality of medical care, he maintained that examining and improving processes provides a way to evaluate whether the best medical care has been applied (Donabedian, 2005). Processes are the guided activities of an organization. Protocols and guidelines can be used to direct organizational activities, and can serve as a feedback mechanism, or benchmark, for evaluating improvement in outcomes (Smitz Naranjo & Kaimal, 2011).

Setting and Resources

This project took place in the student health clinic at Morehead State University, a rural co-ed public institution of higher learning located in the foothills of the Daniel Boone National Forest at the edge of Appalachia in Morehead, Kentucky on a more than 700-acre main campus. Although the university has satellite campuses in several outlying areas surrounding Rowan County, the clinic primarily serves the health needs of students living on campus or commuting regularly to the main campus. The surrounding area includes the Daniel Boone National Forest and Cave Run Lake, both of which are frequented by many of the students at the university for recreation.

A wide range of services is available in the clinic, including health, counseling, laboratory, dental, provider offices, and clinic business services. Laboratory services are provided by Quest Laboratories in Cincinnati, Ohio. Laboratory specimens are collected each evening by a courier and transported to a Cincinnati laboratory for testing. The clinic has a

dedicated computer and a dedicated printer for receipt of test results, most are which are received the next business day.

For charting purposes, the clinic uses Medicat, an electronic medical record that was developed specifically for the use of college health clinics. Medicat features include a demographic, scheduling and check-in module with business and billing features, and an electronic charting module. The charting module contains both pre-built templates for health conditions, and the capability of building clinic-specific templates and favorite notes for specific health problems. Also included are interfaces for electronic prescribing capabilities, paperless immunization compliance, HIPAA compliant secure messaging, and order and result interfaces with built-in scanning capabilities for inclusion of lab and radiology results into the individual medical records. The use of an EHR provides improved organization and access to patient information, increased efficiency, and improved safety (Kossman & Scheidenhelm, 2008).

Study Population

All students, whether full-time or part-time, are eligible for a wide range of clinic services at the MSU clinic. College health services provide easy access to care for health problems, both acute and chronic, and can enhance student retention (Prescott, 2011). "Students whose health status is positive and flourishing have greater ability and readiness to learn and engage fully in all meaningful educational experiences inside and outside the classroom" (Skorton & Altschuler, 2013, para. 7; Silverman, Underhile, & Keeling, 2008, p. 7).

The main campus of MSU in Morehead, Kentucky had an enrollment of 10, 075 undergraduate students and 1,282 graduate students during the fall semester of 2013 with a grand total of 11,358 enrolled students. The student population at MSU includes students from 108 Kentucky counties, 44 states, and 29 nations. Of the more than 11,000 students in the 2013-2014

school year, 9,208 were white and non-Hispanic. The second largest racial or ethnic group represented was African Americans at 333 students. Other groups represented in smaller numbers were Asian, Hispanic/Latino, American Indian or Alaskan natives, native Hawaiian or Pacific islanders, those who were two or more races, and those with unknown race or ethnicity. In a typical week, the clinic sees an average of 259 patients, 33 of whom are African Americans and fewer of other races.

Methods

Human Subject and Research Approval Procedure

Permission to conduct the retrospective chart review was obtained from the institutional review boards at the University of Kentucky and Morehead State University.

Protocol

A clinic protocol for management of hypertension was developed based on an evidence-based literature review with emphasis on the recommendations of JNC 8 (Table 1). According to Wakefield (2008), evidence-based protocols guide actions and improve knowledge, competency, and health care quality and safety. Using Donabedian's Model as a guide, an audit tool was developed to evaluate compliance with the MSU hypertension protocol (Tables 2, 3, and 4). According to Wakefield (2008), evidence-based protocols guide actions and improve knowledge, competency, and health care quality and safety. The clinic protocol for management of hypertension was utilized to define the processes to be evaluated.

Design

This was a retrospective chart review study. The study period designated for the chart review was January 1, 2015 through May 31, 2015. Charts with the International Classification of Diseases (ICD) 9th revision codes for hypertension, specifically 401.1 (benign essential

hypertension), and 401.9 (unspecified essential hypertension), and in the designated study period, were identified through a chart search in Medicat, the clinic's electronic medical record, covering the period from January 1, 2015 through May 30, 2015. Clinic patient numbers were used to locate the charts found in the search. Following data collection, test numbers were assigned to each chart, then the list of medical record numbers was destroyed to protect the privacy and security of the patients protected health information (PHI). Only aggregate data was used for the study.

Sample

This project utilized a convenience sample of student patient data extracted from the MSU clinic's EMR. Student patient data collected included information from the charts of the 13 student patients in the sample, aged 18 to 30, of all races, genders and ethnicities, seen in the MSU clinic for a retrospective 6-month period with a diagnosis of hypertension.

Data Collection

Demographic data were collected to describe the characteristics of the population and the specific medications ordered were recorded. Data were collected from the clinic's electronic medical record utilizing the audit tool to evaluate providers' level of compliance with the MSU hypertension protocol in initiating lifestyle changes, prescribing medications, scheduling follow-ups and ordering the appropriate lab work. Lifestyle change recommendations that were audited included smoking cessation, weight control or loss, dietary modifications, increased physical activity, and limited alcohol use. Compliance with recommending and ordering lab work, including a basic metabolic panel (BMP) or comprehensive metabolic panel (CMP), and fasting lipid profile, within six weeks after diagnosing and/or prescribing medication was evaluated

using the audit tool. Tables 2, 3, and 4 represent the specific demographic, provider compliance, and outcomes data collected.

Results

Microsoft Excel was used to analyze the data. Demographic data collected included age, gender, and race. BMI was recorded for each patient in the sample. Descriptive statistics, including numbers, percentages, means and standard deviations, were used to describe the population. Data were collected to measure provider compliance with the protocol in prescribing medication, initiating lifestyle changes, and recommending lab tests. Patient outcomes data collected included blood pressures, weights, and LDL results. Percentages were used to measure outcomes data for the sample and all percentages were rounded to two decimal places. (In some instances the totals do not equal 100% due to rounding.)

Sample Characteristics

The mean age of the sample was 22.7 years with 69.23 % in the 18-25 age range and 30.77% in the 26-30 age range (see Figure 2). Sixty-one and five tenths % were males and 38.5% were females. Races or ethnicities in the sample included 84.6% whites and 15.4% African Americans (see Figure 3). Two patients had an initial BMI that was ≤ 25 (15.38%), one had a BMI between 26 and 30 (7.69%), and 10 had BMIs of > 30 (76.92%). Of the ten patients with BMIs over 30, five had BMIs over 40 (with one of those at 53.4). The mean BMI for the sample was 36.38 with a standard deviation of 9.57. (See Table 2)

Clinical Characteristics

Processes.

Lifestyle recommendations. Aerobic exercise for 30 minutes five days per week was recommended to 46.2% of the patients. Alcohol limitation was recommended to 15.4% of the

patients. Smoking cessation was not recommended to any of the patients because there were no smokers in the sample. Weight maintenance was recommended to 2 patients. A 5% weight loss within 6 months was encouraged for 46.15%, and weight maintenance was recommended for 7.69%; 46.15% did not receive weight recommendations. Lab tests, within 6 weeks of diagnosis or initiation of antihypertensive medication, were recommended to 61.54%. Lab tests recommended included BMP or CMP and fasting lipid panels (see Figure 4). Dietary modifications were recommended to 46.15% of the patients. Specifically, fruits and vegetables were recommended to 23.08%, low fat was recommended to 23.08%, and no added salt (NAS) was recommended to 46.15%. (See Figure 5).(See Table 3)

Medications prescribed. An ACE inhibitor (ACEI), alpha receptor blocker (ARB), or a thiazide are the preferred initial medications for hypertension. Twelve patients (92.31%) were prescribed one or more of these medications. Eight patients (61.54%) received an ACE1 alone, three (23.08%) received a thiazide alone, one (7.69%) received a combination ACE1/thiazide, and one patient (7.69%) was not prescribed any medication. (See Table 3) (See Figure 6)

Outcomes.

LDL. Although labs within 6 weeks of diagnosis (or initiation of medication) was recommended to eight patients in the sample, only two (15.38%) followed through with having the labs done. Both of the two who were tested had an LDL $\leq$ 130.

BMI / weight. Initially two patients in the sample had a BMI $\leq$ 25, 1 had a BMI between 26 and 30, and ten had a BMI > 30. Outcomes of weight management resulted in two patients maintaining a BMI $\leq$ 25. One patient, with an initial BMI of 32.5 and a weight at 220 lbs., lost 11 lbs., reducing weight to 209 lbs. This was the only patient, of the initial 10, with an initial BMI > 25 who had a weight loss of 5%.

Blood pressure. 69.23% had an outcome SBP of < 140. 69.23% had a DBP of < 90. (See Table 4) (See Figure 7)

Discussion

The purpose of this practice inquiry project was to improve the management, quality of care, and outcomes for the clinic's student patients who have a diagnosis of hypertension. The first objective of the quality improvement project was to assess the prevalence of elevated blood pressure in college students seeking care in the MSU clinic. Due to the small sample size, this prevalence cannot be reliably determined. The second objective was to develop a clinic protocol for the management of hypertension. The completed protocol was implemented after familiarizing the staff with roles and responsibilities for improving quality of hypertension management in the clinic. A goal was established to achieve control of hypertension in 75% of the patients seen in the clinic, defined as a systolic blood pressure of < 140 and a diastolic blood pressure of < 90. The goal was not reached but the benchmark was achieved in 69.23% of the sample. One patient's compliance with medication, weight loss, lifestyle changes and having the recommended lab work done lead to achieving blood pressure control, a 5% weight loss and normalization of the LDL. While young adults with hypertension typically tend to be less aware or concerned about high blood pressure, they are more likely to achieve control with treatment (Egan et al., 2010).

Provider compliance with the hypertension protocol was evaluated by assessing initiation of specific lifestyle changes, medications prescribed, and recommending labs (CMP or BMP and a fasting lipid panel within 6 weeks of diagnosis or starting an antihypertensive medication. This area needs improvement. Preferred antihypertensives were used in all twelve patients who were prescribed medication. Appropriate labs were recommended to 61.54% of the sample patients,

but only 2 patients (15.38%) had the lab work done. Initiation of lifestyle changes was inconsistent and improvement is needed. The chart review period started within a month of the completion of the clinic's hypertension guideline. If more time had been allowed between the introduction of the guideline to the staff and the start of the review period, it may have allowed more time for the staff to assimilate the points in the guideline and plan for managing the changes required by the protocol. Providers incorporated the primary management goals in a template that guided both management and charting. There was not much time to create the template and put it into practice before the start date for the study period. Education, knowledge of the guidelines, and implementation of protocols are not sufficient for improving compliance. One way to improve compliance would be to share results of audits with the providers and staff and ask for their oral or written feedback regarding the results of the audit with suggestions for improvement (Matthew-Maich, Ploeg, Dobbins, & Jack, 2013). Collaboration is key to compliance.

Although the study sample size was anticipated to be 40, the sample size was much smaller at 13. The Affordable Care Act has vastly expanded healthcare access and the availability of choices of clinics and providers. Before the ACA, many students could not afford to seek care at other clinics. The policy of the MSU Health Clinic is to see a patient free of charge if they do not have health insurance. There is also no co-pay for visits. Students with chronic conditions, who did not have insurance prior to the ACA but have acquired insurance since the ACA has made insurance available to them, may have opted to seek care at other clinics, either in the vicinity of the university clinic or in their hometown, after they acquired health insurance. The semester when the study was done may have been a factor also. During the spring semester the students have been in school for months and they may have become

involved in activities and projects that they were not engaged in during the fall semester. This would place more demands on their time, and they may not prioritize healthcare unless it is for an acute illness or injury.

The focus of this study was improving quality of management of hypertension in the Morehead State University health clinic. However, the alarmingly high number of obese students in this sample cannot be ignored. All but two of the students were overweight, obese or morbidly obese. The American College Health Association conducts periodic nationwide surveys of U.S college student's surveys of college students to identify trends related to the health of U.S college students. In 2006, the results of the National College Health Assessment found that over 30% of the more than 80, 000 college students who completed the survey were overweight or obese (Morrell, Lofgren, Burke, & Reilly, 2012;).

Adis Medical Writers (2013) noted that there is a high correlation between obesity and hypertension in younger patients. The mean BMI for the convenience sample of patients was 36.38. An overwhelming 12 of 13 (92.31%) of the patients in the sample had BMIs greater than 25. Only 2 of these were in the 26-30 BMI range. Five were obese with BMIs over 30 but less than 40, while the remaining 5 were morbidly obese with BMIs over 40. One of these five had a BMI of 53.4. Obesity leads to activation of the sympathetic nervous system, sodium retention, and activation of the renin-angiotensin system (Re, 2009). The usual guidelines apply to treatment of obesity-related hypertension but with a greater emphasis needs to be placed on weight loss (Re, 2009). Hyperlipidemia and abnormal glucose tolerance are commonly present in these patients (Flynn & Falkner, 2011). Diuretics and beta-blockers can worsen glucose tolerance, further complicating treatment (Re, 2009). Ace inhibitors may actually improve glucose tolerance, but treatment with other drug classes is often needed in obese patients to

achieve control of blood pressure (Re, 2009). Due to the significant level of obesity in the sample, providers should be familiar with the effects of medications on glucose tolerance in choosing an appropriate antihypertensive and should emphasize weight loss with obese hypertensive patients. With the next review of the hypertension management protocol, the clinic should consider adding approaches for treating obese patients.

Limitations

The sample in this study was small, conducted in only one setting, and there was little ethnic diversity. The results of this study cannot be generalized to other settings. Very little time was allowed for the staff in the clinic to become familiar with the newly developed clinic hypertension management protocol before the start date of the study period. Measures of provider compliance with the protocol, and patient outcomes may have improved if more time was allowed for assimilation of the protocol by the staff before the projected start date of the study period. The patients' level of compliance with lifestyle changes cannot be objectively measured as progress reports on follow-up visits were based on self-report. Only 2 patients (15.38%) followed through with recommended lab work, so the limited data from 2 patients on LDLs is essentially meaningless for this study. Other outcome measurements suffered from a similar lack of sufficient data. BMIs and weights are recorded for each visit to the clinic, so data on weight changes was more reliable in comparison to the other measures. Finally, blood pressure measurements should be taken after patients have been sitting for five minutes to be valid. Given the usual busy environment in the clinic, it is likely that the correct procedure was followed.

Implications for Practice

Provider Compliance

The Academic Center for Evidence-Based Practice Star Model (ACE) defines strategies for translating evidence-based knowledge into healthcare practice (Schaffer, Sandau, & Diedrick, 2013; Stevens, 2012).

> The five model steps are: (1) discovery of new knowledge; (2) summary of the evidence following a rigorous review process; (3) translation of the evidence for clinical practice; (4) integration of the recommended change into practice; and (5) evaluation of the impact of the practice change for its contribution to quality improvement in health care. (Schaffer et al., 2013, p. 1200; Stevens, 2012)

There may be delays when implementing evidence-based evidence into clinical practice (Irwin, Bergman, & Richards, 2013). According to Fineout-Overholt, Melnyk, and Schultz, gaps and delays are more often due to external factors that influence implementation than professionals' knowledge and skills (Irwin et al., 2013; Fineout-Overholt, Melnyk, & Schultz, 2005). Support from managers and providers is an important factor in implementing evidence-based practice, especially in providing time for facilitating implementation and mentors (Irwin et al., 2013; Fineout-Overholt & Melnyk, 2011).

Provider compliance was poor in this sample with the exception of prescribing appropriate antihypertensive medications that were recommended in the protocol. Meeting with providers to brainstorm the reasons for poor compliance can, not only illuminate reasons for the poor compliance, but will likely also enlist the support of providers in improving compliance. A follow-up retroactive chart review should be done, but before setting the start date, the protocol should be reviewed again in a staff meeting with the clinic director, providers, and staff. We should also ensure that the templates are already done prior to the start date.

Patient Lab Testing Compliance

According to the hypertension management protocol, lab tests should be done within 6 weeks of diagnosis of hypertension or the initiation of antihypertensive medication. The patients should have a BMP or CMP, and a fasting lipid profile. Lab testing was recommended to 61.5% of the patients in the sample, and only 15.4% followed through with having the lab tests done. One of the problems with getting the lab tests done is that the lipid profile should be done when the patient is fasting, and we typically do all of the lab tests at the same time. In order to improve compliance with lab tests, we could take several approaches. If the patient is in the clinic for a visit in the morning, we could ask the patient if anything was eaten yet that day. If not, we could encourage the patient to have the lab testing done at that visit before leaving the clinic. We could also recommend that the patient return for the 4 to 6-week follow-up fasting so the testing could be done then. The BMP or CMP does not have to be done fasting, so even if the patient has already eaten, we could do that test and plan the fasting lipid panel for the next visit. The patient should once again be reminded to come to the next visit fasting. If we suspect it will difficult to get the patient to come to a visit fasting, we could consider doing the lipid panel in a non-fasting state, although this would affect accuracy of the test.

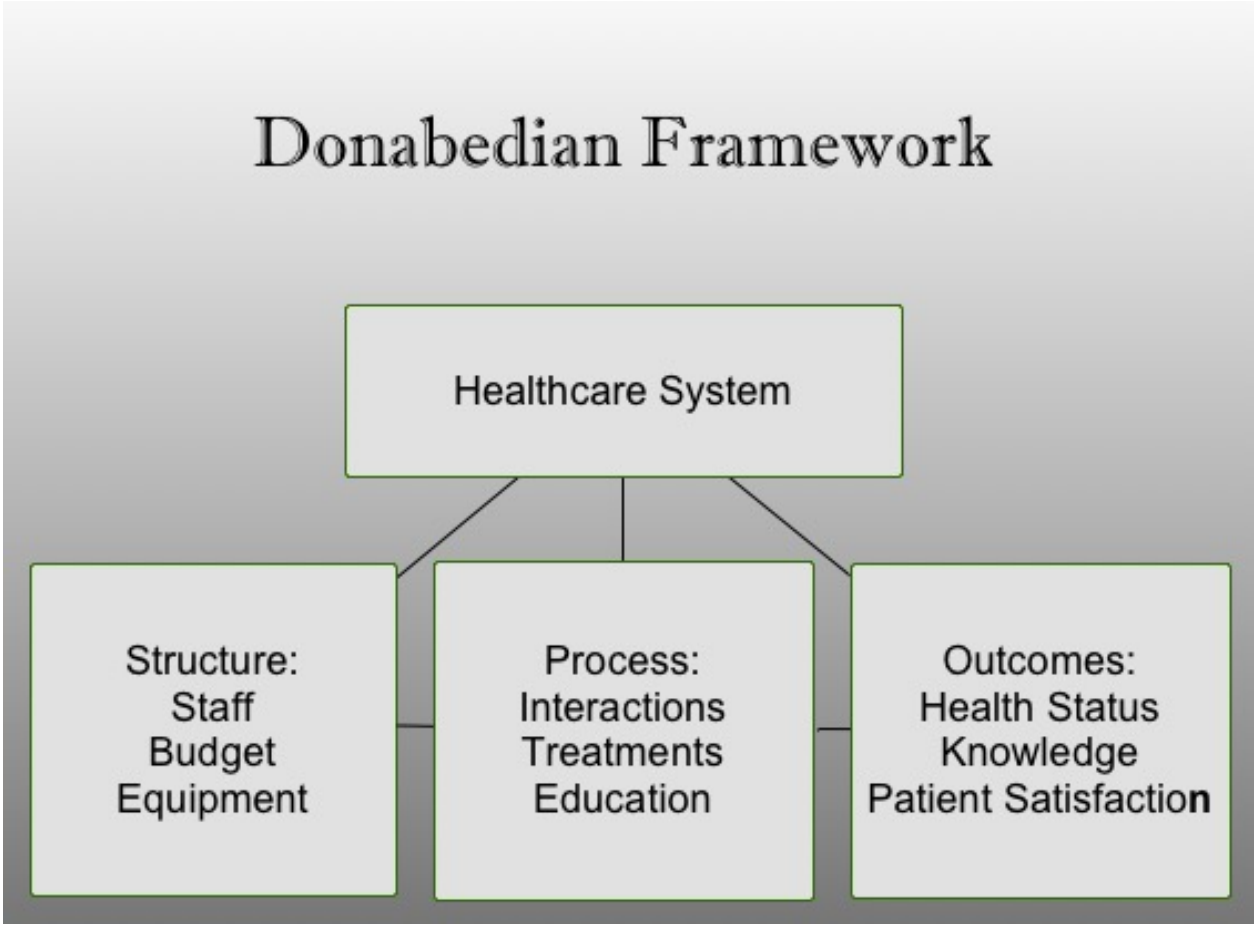
Although the sample was small in this study, and the results of the retroactive chart review were poor in some instances, there were several findings from the study that can guide future strategies for management of these patients in our clinic. The mean BMI of the patients in this sample, at 36.38, should increase awareness of the magnitude of the obesity problem in our setting and drive future screening, management and treatment of hypertension and other obesity-related diseases and conditions. Many college students have little awareness of the long-term complications and risks associated with obesity and untreated hypertension (Egan et al., 2010).

Promoting awareness of these risks should be a priority in a college health setting. Students should be educated about the importance of a healthy diet, exercise, and managing weight to reduce long term risk of cardiovascular disease and other health problems.

Conclusion

Emerging adulthood, the developmental period that includes the transition from adolescence to adulthood, is typified by risky health behaviors (Arnett, 2000; Laska et al., 2009). It is a stressful period of development and changing roles. There may not be a high priority placed on healthy behaviors such as a healthy diet, exercise, or adherence to recommendations for health maintenance or managing chronic health problems (Laska et al., 2009). Since the incidence of obesity was high in this sample, weight loss recommendations should receive high priority in the future in this clinic. Long-term health and outcomes are affected by behaviors that may be characteristic during this period of growth and development. Age affects awareness of hypertension and its' long term consequences, and younger individuals, aged 20-39 are less cognizant of hypertension than older adults (Egan, Zhao, & Axon, 2010). In contrast, if those younger adults with hypertension are treated, they are more likely to achieve control (Egan et al., 2010). Efforts should be focused on raising awareness of hypertension and the long-term consequences of untreated hypertension.

Figure 1 Donabedian Framework



Note. Adapted by the PI from concepts described in Donabedian, A. (2005). Evaluating the quality of medical care. *The Milbank Quarterly*, *83*(4),691-729. http://dx.doi.org/10.1111/j.1468-0009.2005.00397.x

Table 1. Morehead State University Health Clinic Protocol for Management of Hypertension

MSU Counseling & Health Services Protocol	
Revision: 1	Prepared by Kathleen Solter APRN
Effective Date:	December 1, 2014
MANAGEMENT OF HYPERTENSION	
Policy/Procedure:	To ensure evidence-based management of hypertension and use of consistent management and treatment guidelines among providers.
Purpose:	To provide the steps for diagnosis, treatment and management of elevated blood pressures for clinic patients.
Scope:	This procedure applies to all clinic health services nurses and prescribing healthcare providers.
Responsibilities:	Nurse admitting patient to exam room is responsible for taking vital signs, recording current medications and medication allergies, determining patient's preferred pharmacy, and recording patient statement of purpose of visit. Provider is responsible for viewing vital signs and determining if blood pressure is within normal limits. For blood pressures outside of normal range, provider will determine course of management based on clinic procedure.
Policy and Procedure:	Management of Elevated Blood Pressure or Hypertension in Adults < 60 years of age.
Definition:	Essential hypertension has no identifiable etiology but is likely due to multiple factors. To be diagnosed as hypertension, blood pressure remains elevated, if not treated.

<table>
<tr><td>Risk Factors:</td><td>

Obesity
Diet high in sodium and fat and low in potassium
Excessive alcohol intake
Ethnicity – Non-Hispanic blacks have highest incidence and prevalence.
Family history of hypertension.
Smoking
Physical inactivity
Oral contraceptive use

</td></tr>
<tr><td>Classification of adult blood pressure</td><td>
<table>
<tr><th>Category</th><th>Systolic (mm Hg)</th><th></th><th>Diastolic (mm Hg)</th></tr>
<tr><td>Normal</td><td><120</td><td>and</td><td><80</td></tr>
<tr><td>Pre-hypertension</td><td>120-139</td><td>or</td><td>80-89</td></tr>
<tr><td>Stage 1 hypertension</td><td>140-159</td><td>or</td><td>90-99</td></tr>
<tr><td>Stage 2 hypertension</td><td>≥ 160</td><td>or</td><td>≥ 100</td></tr>
</table>
* Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.
</td></tr>
<tr><td>Intake:</td><td>Nurse admitting patient to exam room will obtain and record vital signs, medication list, medication allergies, and pharmacy of choice. If initial systolic BP is ≥ 140 or diastolic BP is ≥ 90, nurse will re-take BP with manual cuff after patient is sitting for 5 minutes.</td></tr>
<tr><td>History:</td><td>

Provider will ask about history of elevated BPs; if treated previously, ask about successes/failures of treatment or adverse effects of previous medications.
Question about symptoms of stress and history cardiovascular disease, renal disease, diabetes, or dyslipidemia.
Inquire about weight control, physical activities, tobacco use, and alcohol use.
Ask about family history of hypertension, diabetes, renal disease, and dyslipidemia.
Review medication history, including illicit drugs and drugs that may elevate BP including NSAIDs, decongestants, and appetite suppressants.

</td></tr>
</table>

Physical Exam:	• Perform a complete heart and lung exam. Include other systems as indicated by history.
Diagnosis	• Diagnose with hypertension if systolic BP ≥ 140 or diastolic BP ≥ 90 on three blood pressures in at least 2 separate visits on different days.
Tests:	• Consider lab tests prior to initiation of medication. If lab tests not done prior to initiation of medication, lab tests should be done within 6 weeks of initiating treatment to include: Fasting lipid panel, CBC, BMP or CMP. Lab work should be repeated yearly thereafter.
Lifestyle Modification	• Recommend weight loss for those with BMI ≥ 25. • Recommend no-added salt diet. • Recommend daily aerobic exercise for 30 minutes daily at least 5 days per week. • Recommend consumption of a diet high in fruits and vegetables and low in saturated fats (limit intake of red meats, avoid fast foods and fried foods). • Recommend smoking cessation if patient is a smoker. • Recommend limiting consumption of alcohol. • For those patients who prefer trying lifestyle modifications first, in lieu of medication, allow 6-month trial before initiating medication.
Initiation of Medication*:	• Initiate pharmacologic treatment to lower BP at DBP ≥90 mm Hg and treat to a goal DBP <90 mm Hg. • Initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg and treat to a goal SBP <140 mm Hg. • In presence of chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to goal SBP <140 mm Hg and goal DBP <90 mm Hg. • In the presence of diabetes, initiate pharmacologic treatment to lower BP at SBP ≥140 mm Hg or DBP ≥90 mm Hg and treat to a goal SBP <140 mm Hg and goal DBP <90 mm Hg.

	* Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.
Medication*:	• In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). • In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB. • In the population aged ≥18 years with CKD, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. Applies to all CKD patients with hypertension regardless of race or diabetes status. • If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug - thiazide-type diuretic, CCB, ACEI, or ARB. • If goal BP cannot be reached with 2 drugs, add and titrate a third drug - thiazide-type diuretic, CCB, ACEI, or ARB. • Do not use an ACEI and an ARB together in the same patient. • If goal BP cannot be reached using only the four drugs recommended because of a contraindication or the need to use more than 3 drugs to reach goal BP, antihypertensive drugs from other classes can be used. Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed. * Adapted from the eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC VIII report (JAMA, 311(5), 507-520.
Follow-up:	• After initiating medication, follow-up visit should be scheduled with patient within 6 weeks of initiating treatment for first stage hypertension, in 1-2 weeks for second stage hypertension. • Schedule subsequent follow-up visits every 6 months.

Table 2: Characteristics of Sample

Demographic Characteristics	Sample Results
Age, mean (SD)	22.7±3.5
Gender	
Male, n (%)	8 (61.54%)
Female, n (%)	5 (38.46%)
Race/Ethnicity	
Asian n (%)	0 (0%)
African American n (%)	2 (15.38%)
Latino or Hispanic, n (%)	0 (0%)
White, n (%)	11 (84.62%)
Other, n (%)	0 (0%)
BMI	
≤ 25	1 (7.69%)
26-30	2 (15.38%)
>30	10 (76.92%)

Note. The mean BMI for the sample was 36.38 with a standard deviation of 9.57.

Table 3: Processes

Variables	Number	Percent
Recommended aerobic exercise for 30 minutes 5 days per week.	6	46.15%
Recommended dietary modification	6	46.15%
• Fruits and vegetables	3	23.08%
• Low fat	3	23.08%
• No added salt (NAS)	6	46.15%
Recommended smoking cessation (smokers) [a]	0	0%
Recommended limiting alcohol to 2 drinks per day for men, 1 drink per day for women.[b]	2	15.38%
Recommended lab tests within 6 weeks of diagnosis (or initiation of anti-hypertensive medication if not done at time of diagnosis).	8	61.54%
Recommended weight loss or maintenance based on BMI at time of diagnosis.	7	53.85%
5% in 6 months if BMI > 25	2	15.38%
Medication:	12	92.31%
• ACE1	8	61.54%
• ARB	0	0%
• Thiazide	3	23.08%
• ACE1/Thiazide	1	7.69%
• Other	0	0%
• None	1	7.69%

[a] There were no smokers in the study sample.
[b] A drink is one 12 oz. beer, 4 oz. of wine, 1.5 oz. of 80-proof spirits, or 1 oz. of 100-proof spirits (AHA, 2014).

Table 4: Patient Outcomes

Variables	Number	Percent
Lipids: LDL ≤ 130	2	15.38%
BMI		
• Maintain BMI ≤ 25	2	15.38%
• 5% weight loss	1	7.69%
• < 5% weight loss	10	76.92%
Blood Pressure		
SBP < 140	9	69.23%
DBP < 90	9	69.23%

Figure 2 Age Distribution of Sample

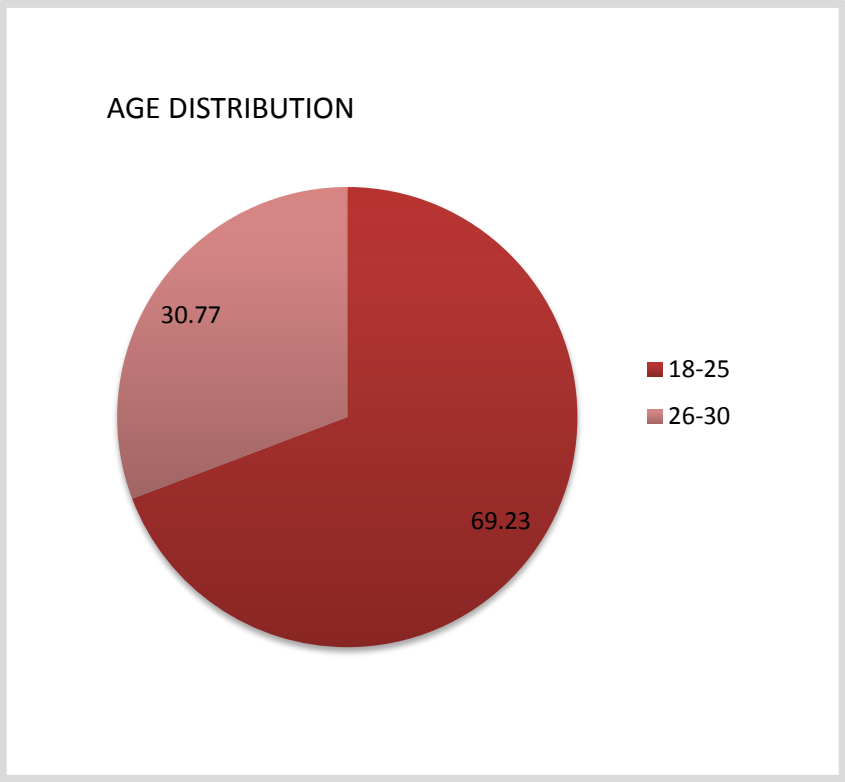


Figure 3 Ethnicity Distribution.

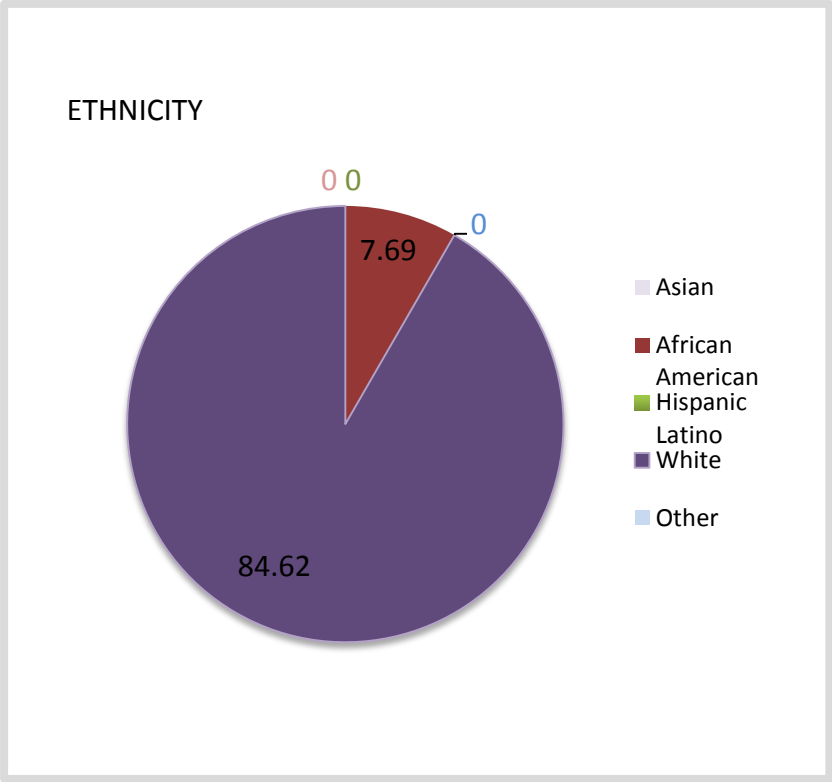
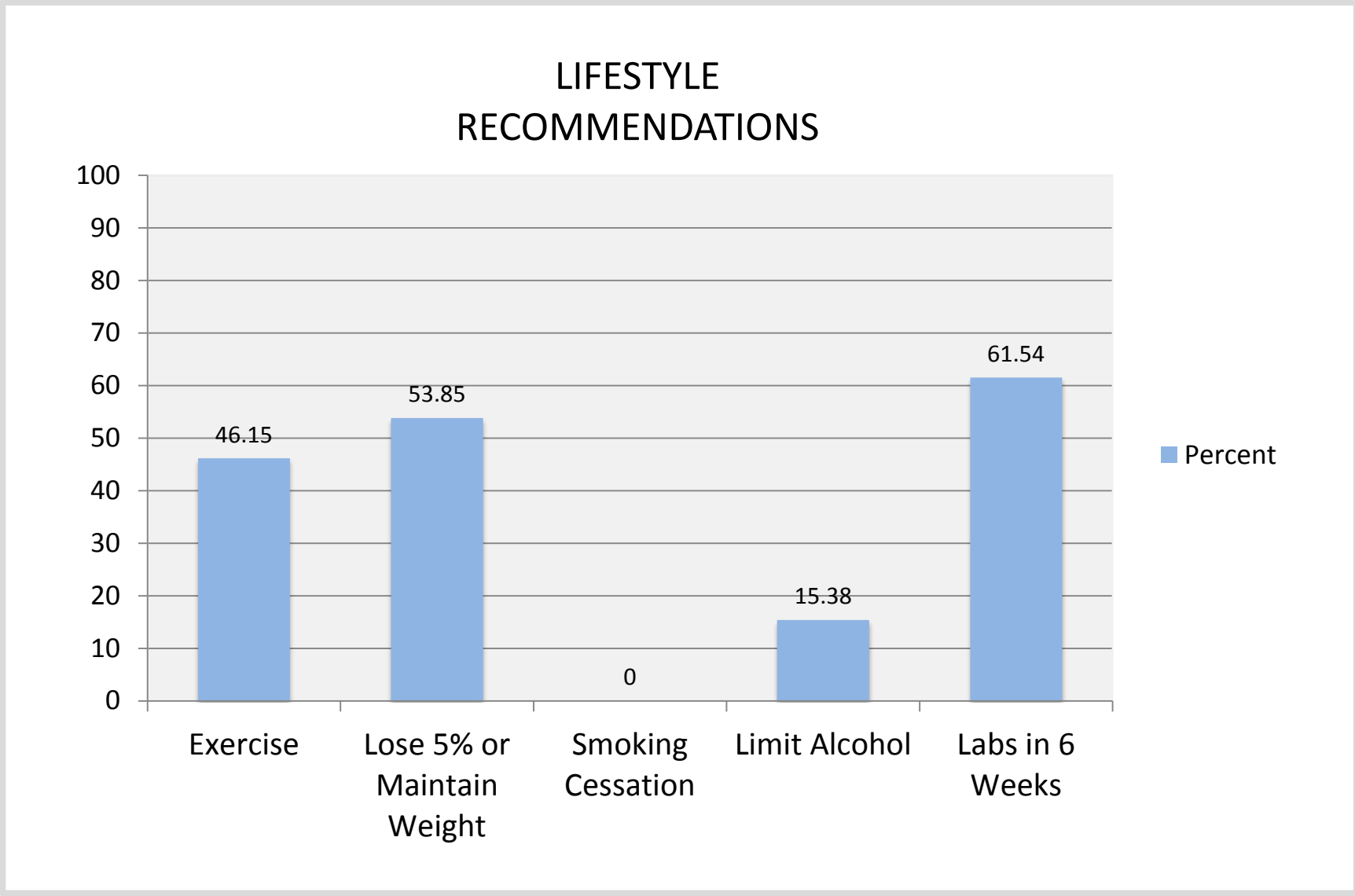


Figure 4. Lifestyle Recommendations Made by Providers



Note. No tobacco users represented in sample.

Figure 5. Dietary recommendations made to patients in sample

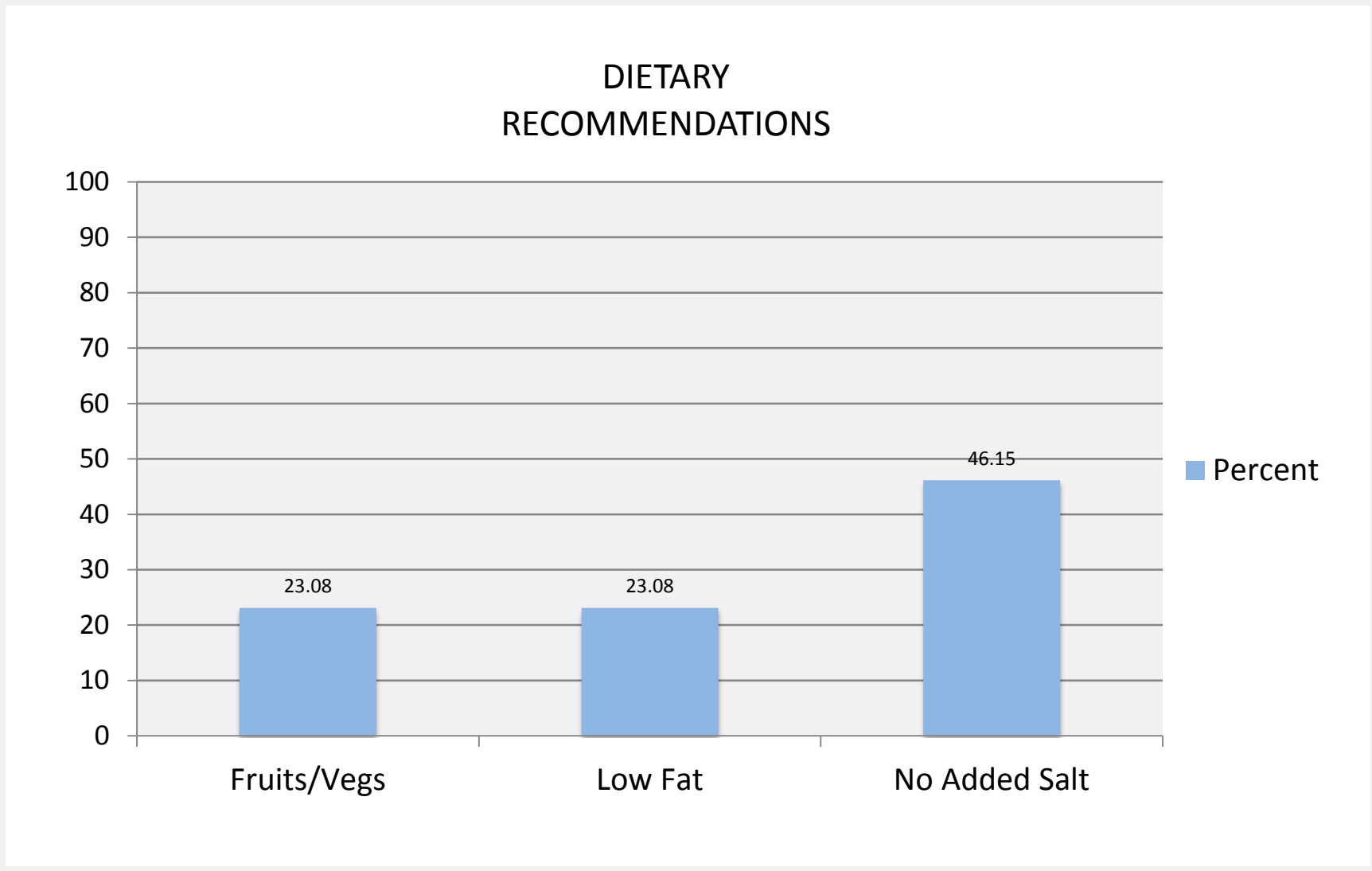


Figure 6. Antihypertensive medications prescribed to patients in sample

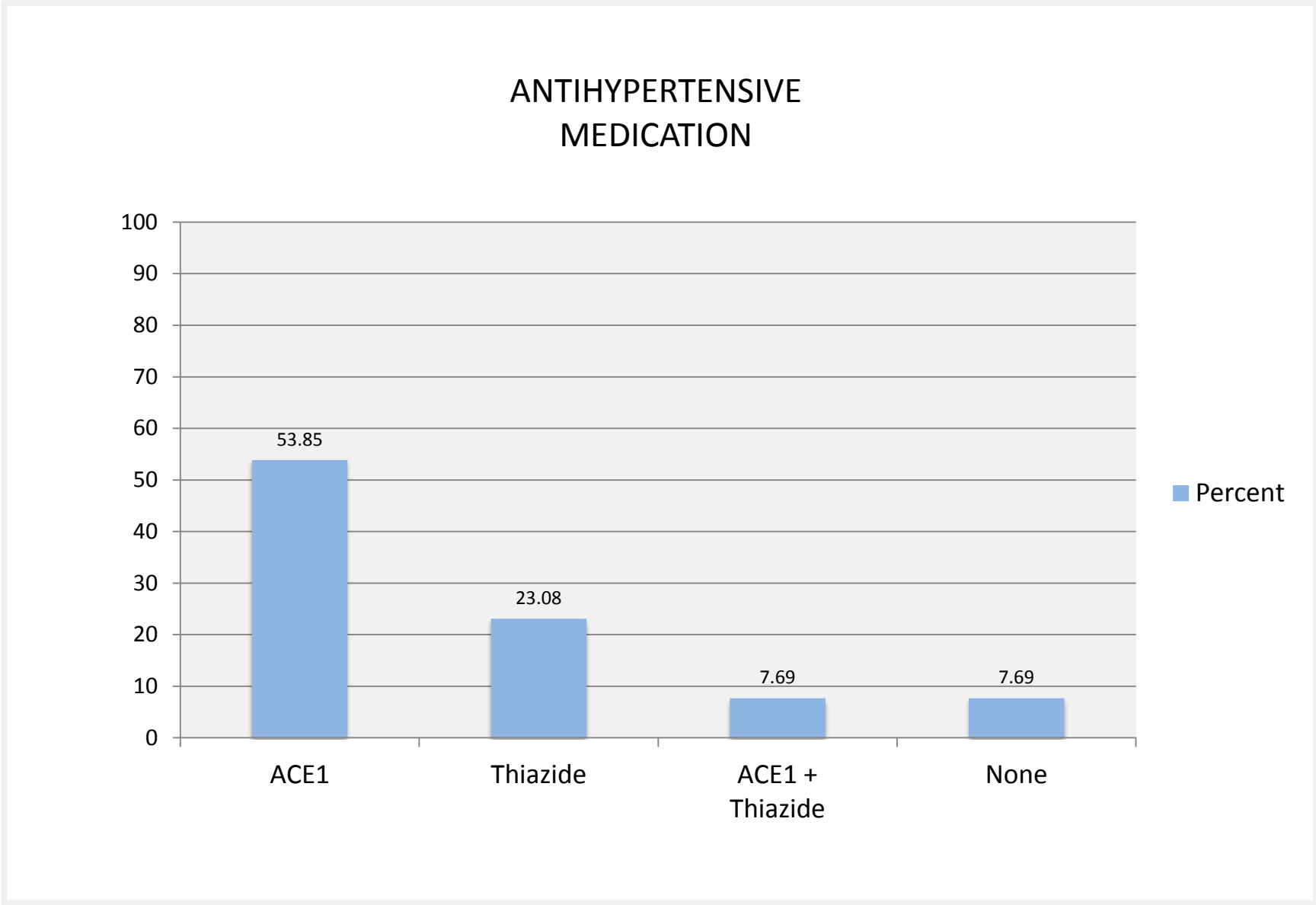
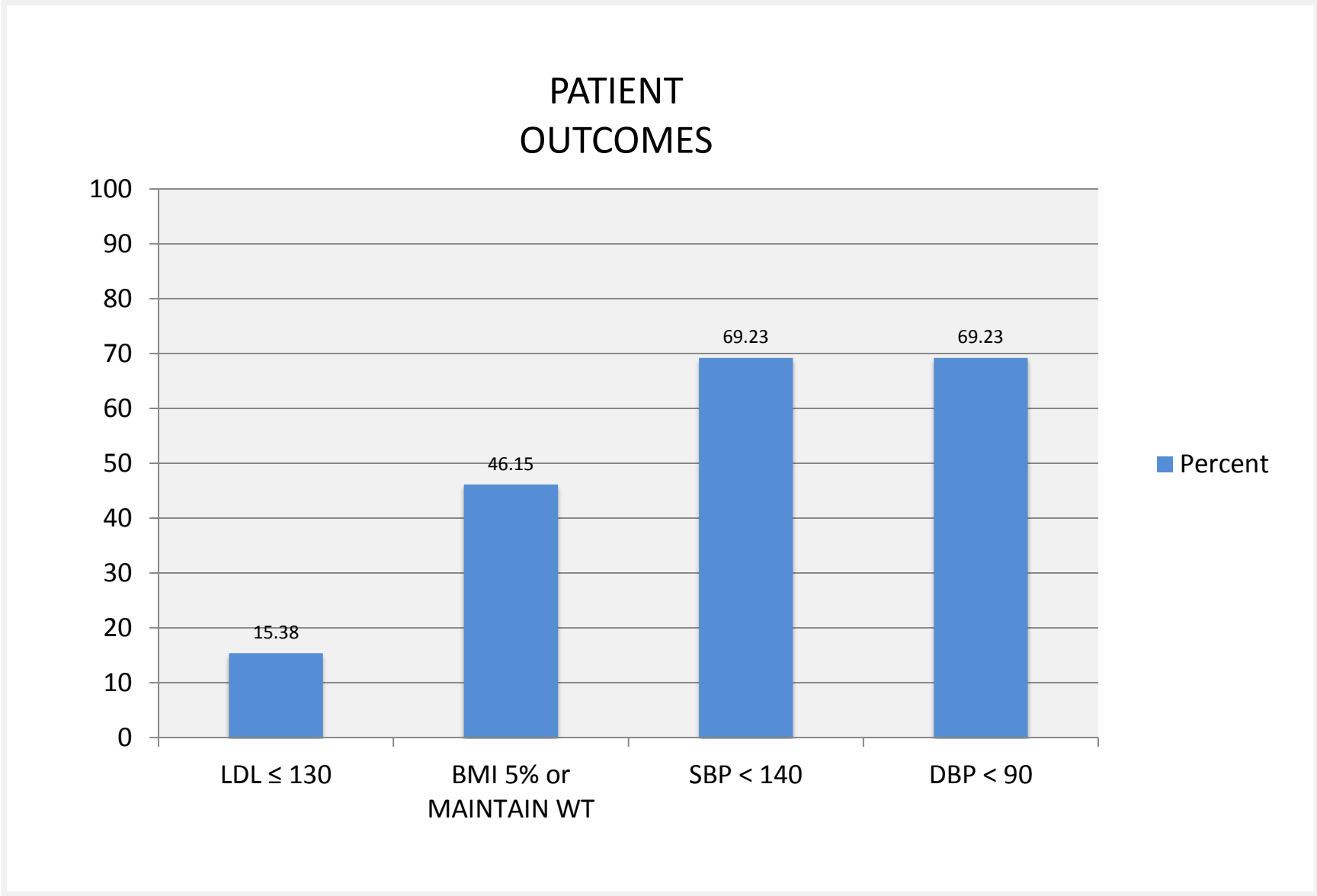


Figure 7. Outcomes of patients in sample



Conclusion to Practice Inquiry Project Report

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The first manuscript presented a review of available literature chronicling uses of the balanced scorecard in a variety of healthcare settings. Our long term objective is to develop a balanced scorecard for the Morehead State Counseling and Health Clinic. A review of available evidence-based guidelines for management of hypertension was the focus of the second manuscript along with an overview of the process of developing a protocol for management of hypertension for the MSU health clinic. Finally, the third manuscript describes a retrospective chart review of a convenience sample of MSU student patients, with diagnoses of hypertension. following use of the protocol for a 5-month period, to determine patient outcomes in 4 key benchmarks—systolic and diastolic blood pressures, LDL results and changes in weight.

In student patients, emphasis should be placed on preventing the long-term complications of hypertension. Education is key to engaging patients in their own care. Conditions that pre-dispose patients to hypertension, such as obesity, should be fully addressed. Providers should be aware of special considerations that are important for obese patients. Identifying barriers to weight loss and other lifestyle changes should be thoroughly explored and addressed. The frequency of obesity and morbid obesity in the study sample is alarming and should be fully understood and addressed. It would be interesting to note if other studies of hypertension in student patients reveal similar high frequencies of obesity. It is hoped that there will be more research on hypertension in student patients to increase our understanding of the special issues that college-aged students face in adhering to medication regimens and lifestyle modifications and how these issues can be addressed to improve students' ability to follow recommendations to manage hypertension and associated health care issues.

Engaging providers and staff in the development and revising of protocols could improve

compliance with protocols. Providers should ensure that documentation of lifestyle modification education, adherence to medication regimen, lab work, blood pressures and weight is accurate and complete.

The balanced scorecard is an excellent way to coordinate quality care. While it takes significant time and effort to develop a balanced scorecard, a well thought-out scorecard could provide a means to monitor quality of care and to manage other issues such as patient satisfaction and financial issues. Fiscal responsibility is important in ensuring that a clinic remains solvent and makes the best use of discretionary funds to benefit student patients. This study was the first step in developing a scorecard for the MSU clinic. In the future, additional perspectives and objectives should be added to further the development of the scorecard, and in so doing improve the quality and efficiency of care that is delivered in the clinic.

Implications for Doctoral-Prepared Advanced Practice Nurses

DNP Essentials

The Essentials of Doctoral Education for Advanced Nursing Practice, or the DNP Essentials, include eight core competencies that a doctoral prepared nurse should have to lead in an increasingly complex healthcare system in order to improve nursing practice and the outcomes of individual patients and populations. As a Doctor of Nursing Practice candidate, the following summaries outline how these essentials will be applied to my practice.

I. Scientific Underpinnings for Practice

Throughout my DNP education, I have acquired a strong basis in the sciences with courses such as Epidemiology and Applied Statistics. Having acquired knowledge of middle range theories, I will use Nola Pender's Health Promotion Model to empower student patients with hypertension to make lifestyle changes such as weight loss, diet, and exercise to improve their

wellbeing. For example, this model would apply to the problem with obesity in students with hypertension at MSU that became apparent in my practice inquiry project. For my practice inquiry project, I used Donabedian's Framework to guide my quality improvement project to improve the management of hypertension in students in the clinic. I also used a research integration model, the ACE STAR Model of Knowledge to integrate evidence based knowledge into practice.

II. Organizational and Systems Leadership for Quality Improvement and Systems Thinking

As a DNP graduate, one has acquired the ability to improve clinical practice by applying organizational and financial skills learned in the DNP educational courses. Developing a Healthcare Balanced Scorecard for the MSU clinic will continue the work of my practice inquiry project to improve the quality and cultural appropriateness of care in the MSU clinic, ensure customer satisfaction, improve the knowledge and skills of the clinic staff, ensure staff satisfaction and retention, and ensure fiscal responsibility in the use of funds and resources available to the clinic.

The Balanced Scorecard will enhance ability to evaluate and improve the care of patients with acute conditions and with chronic conditions such as diabetes, thyroid disease, and asthma, always keeping in focus that care models should be efficient and be fiscally responsible in the use of time and resources available in the clinic. The Leadership course in the DNP program should help with conveying changes that are needed in the clinic to meet these goals.

III. Clinical Scholarship and Analytical Methods for Evidence-Based Practice

Quality improvement in the clinic will require applying research to practice and using proven methods to evaluate and make improvements in the care of patients in the clinic. For example, my practice inquiry project involved the use of chart audits to measure outcomes of a

quality improvement project to improve the care of patients with hypertension in the clinic. An evidence-based protocol for management of hypertension provided the basis for structuring care and measuring outcomes.

IV. Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

The Epidemiology and Applied Statistics courses in the DNP program gave me a background for understanding how data can be used to help improve the care of patients and populations. The EMR at the MSU clinic was used to make templates to help guide the care of patients with hypertension. It also was used to gather data to evaluate the translation of the protocol for management of hypertension into practice. Data was gathered from the EMR to evaluate the care provided by the practitioners and the outcomes of the care of hypertensive patients in the clinic using the protocol. Our clinic also makes use of an online student health portal to allow patients to upload records and to receive secure messages from practitioners. This allows us to communicate the results of lab tests and to follow up on patients when indicated. Plans are in place to expand the use of the online student health portal to allow patients access to their health records. Allowing access to records will empower the patients to participate in their own care.

V. Health Care Policy for Advocacy in Health Care

The DNP Health Policy provided a strong background for advocacy in health care. Participation in the Kentucky Coalition for Nurse Practitioners and Nurse Midwives and monitoring the message board for this organization has also increased my awareness of the political issues facing nurse practitioners in the state of Kentucky. The KCNPNM has been very active in promoting nurse practitioners in the state of Kentucky, advancing their ability to

practice to the full extent of their capabilities. While strides have been made, the participation and support of all nurse practitioners in the state of Kentucky is needed to continue to empower Kentucky's nurse practitioners to increase accessibility to care and improve the quality of care of Kentuckians. I strongly believe in the importance of participating in the KCNPNM to present a united front for Kentucky's nurse practitioners. Because of this belief, I have continuously participated in the KCNPNM since I was a nurse practitioner student to the present day. In the same way, participation in the American Nurses Association supports the advancement of nurses and nurse practitioners to improve their ability to provide accessible, quality care.

VI. Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Collaboration among professionals is a necessary to ensure the best care for our patients. As such, at MSU we have a strong working relationship with the athletic trainers to ensure that the health of our athletes remains a top priority. We also maintain relationships with specialists in the area and refer patients who need care that is beyond our capabilities in the clinic. Not only is collaboration important with entities outside the clinic, but inside the clinic as well. Fostering respect and cooperation with the nursing staff at the MSU clinic is a high priority and improves the care provided to our patients. Also we work closely with the counseling staff in the clinic to ensure the best care for our patients with mental health needs. This not only ensures the best mental health possible, but also improves their ability to succeed academically and remain in school. We also work in close cooperation with the Rowan County Health Department when the need arises and have a strong relationship with members of the health department.

In this practice inquiry project, the quality improvement study revealed poor provider compliance with the protocol. While this was not necessarily due to poor collaboration among the providers in the clinic, involving the to improvement in compliance in the future. Repeat

audits should be expected to improve because the providers and clinic staff would be encouraged, by participation, to feel ownership in the outcomes. providers and the clinic staff in reviewing the results of the study, evaluating the reasons for the poor performance, and in making changes, should lead

VII. Clinical Prevention and Population Health for Improving the Nation's Health

Prevention is key to improving the health of our nation and our community. Focusing on the specific needs of our university student population to improve their health is a priority. It was evident from my practice inquiry project that obesity is a major problem in our population. The project also increased my awareness and the awareness of the MSU clinic of the lack of adequate sources of healthy foods for our students. We need to focus on educating our students and stressing the importance of healthy eating to improve their long-term health since chronic health problems often start with behaviors acquired at this age. There are excellent exercise options available on campus, but healthy food choices are poor so we need to advocate for better availability of healthy food choices on campus by working with the MSU administration to help them understand the depth of the problem and the need for improvement.

VIII. Advanced Nursing Practice

I chose the DNP program rather than the PhD program to further my studies because I wanted to improve my abilities as a practitioner, a health educator, and as an advocate for the improved health of my patient population. I also see the importance of being an advocate for advancing the ability of nurse practitioners in Kentucky to increase access to care for rural Kentuckians, and for allowing nurse practitioners to practice to the full extent of their education and capabilities. The DNP curriculum has increased my awareness of the issues and has improved my ability to support these goals. This

increased awareness and empowerment was facilitated by courses in health policy, research, leadership, and technology. I also see the importance of supporting new practitioners, and I have served as a preceptor in the past. I will continue in this role to help educate and empower new practitioners.

References

Abbass, I., Helton, J., Mhatre, S., & Sansgiry, S. S. (2012). Impact of electronic health records on nurses' productivity. *Computers, Informatics, Nursing*, *30*(5), 237-241.

Adams, S., & McCarthy, A. M. (2007). Evidence-based practice guidelines and school nursing. *The Journal of School Nursing*, *23*(3), 128-136.

ACHA-NCHA. (2014). American College Health Association - National College Health Assessment II: Reference group executive summary spring 2014. Retrieved from http://www.acha-ncha.org/docs/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Spring2014.pdf

Adis Medical Writers. (2014). Individualized treatment with multiple antihypertensive agents is often necessary when treating hypertension in obese patients. *Drugs and Therapy Perspectives*, *30*(1), 21-25. http://dx.doi.org/10.1007/s40267-013-0077-1

American Association of Colleges of Nursing. (2006). The essentials of doctoral education for advanced nursing practice. Retrieved from http://www.aacn.nche.edu/dnp/Essentials.pdf

American College Health Association. (2015). *American college health assessment national college health assessment: Spring 2015 reference group executive summary*. Retrieved from http://www.acha-ncha.org/docs/NCHA-II_WEB_SPRING_2015_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf

American College Health Association. (2012). ACHA guidelines: Standards of practice for health promotion in higher education, 3rd ed. Retrieved from http://www.acha.org/Publications/docs/Standards_of_Practice_for_Health_Promotion_in_Higher_Education_May2012.pdf

American College Health Association. (n.d.). Healthy campus 2020: Student objectives. Retrieved from https://www.acha.org/HealthyCampus/Objectives/Student_Objectives/HealthyCampus/Student_Objectives.aspx?hkey=a9f191de-243b-41c6-b913-c012961ecab9

American Heart Association. (2014). Alcohol and heart health. Retrieved April 25, 2015, from http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyEating/Alcohol-and-Heart-Health_UCM_305173_Article.jsp

American Heart Association. (2013). AHA/ACC/CDC science advisory: An effective approach to high blood pressure control. Retrieved from http://hyper.ahajournals.org/content/early/2013/11/14/HYP.0000000000000003

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480. http://dx.doi.org/10.1037//0003-066X.55.5.469

Bennett, K. J., & Steen, C. (2010). Electronic medical record customization and the impact upon chart completion rates. *Family Medicine, 42*(5), 338-342.

Campbell, T. A., Auerbach, S. M., & Kiesler, D. J. (2007, May/June). Relationship of interpersonal behaviors and health-related control appraisals to patient satisfaction and compliance in a university health center. *Journal of American College Health, 55*(6), 333-340. http://dx.doi.org/10.3200/JACH.55.6.333-340

Centers for Disease Control and Prevention. (2015). High blood pressure facts. Retrieved February 9, 2016, from http://www.cdc.gov/bloodpressure/facts.Cluskey, M., & Grobe, C. (2009). College weight gain and behavior transitions: Male and female differences.

J*ournal of the American Dietetic Association*, *109*(2), 325-329. http://dx.doi.org/10.1016/j.jada.2008.10.045

Cooke, C. R., & Gould, M. K. (2013). Advancing Clinical Practice and Policy through Guidelines. The Role of the American Thoracic Society. *American Journal of Respiratory and Critical Care Medicine*, *187*(9), 910-914. http://dx.doi.org/10.1164/rccm.201301-0009PP

Davis, L. L. (2015). Hypertension: Evidence-based treatments for maintaining blood pressure control. *The Nurse Practitioner*, *40*(6), 32-37. http://dx.doi.org/10.1097/01.NPR.0000465116.19783.a7

Davison, J. A. (2015). Hypertension self-management support in primary care: A DNP quality improvement project and a charge for leadership and advocacy with the Million Hearts. *Tar Heel Nurse*, 14-16.

Donabedian, A. (2005). Evaluating the quality of medical care. *The Milbank Quarterly*, *83*(4), 691-729. http://dx.doi.org/10.1111/j.1468-0009.2005.00397.x

Donabedian, A. (1986). Criteria and standards for quality monitoring. *Quality Review Bulletin*, *12*(3), 99-100.

Egan, B. M., Zhao, Y., & Axon, R. N. (2010). US Trends in prevalence, awareness, treatment, and control of hypertension, 1988-2088. *Journal of the American Medical Association*, *303*(20), 2043-2050. http://dx.doi.org/doi:10.1001/jama.2010.650

Fineout-Overholt, E., & Melnyk, B. M. (2011). ARCC evidence-based practice mentors: The key to sustaining evidence-based practice. In B. M. Melnyk & E. Fineout-Overholt (Eds.), *Evidence-based practice in nursing and healthcare: A guide to best practice* (2nd, pp. 344-351). Philadelphia, PA: Lippincott Williams & Wilkins.

Fineout-Overholt, E., Melnyk, B. M., & Schultz, A. (2005). Transforming health care from the inside out: Advancing evidence-based practice in the 21st century. *Journal of Professional Nursing*, *21*, 335–344. http://dx.doi.org/10.1016/j.profnurs.2005.10.005

Flynn, J. T., & Falkner, B. E. (2011). Obesity hypertension in adolescents: Epidemiology, evaluation, and management. *The Journal of Clinical Hypertension*, *13*(5), 323-331. http://dx.doi.org/10.1111/j.1751-7176.2011.00452.x

Freudenberg, N., Manzo, L., Mongiello, L., Jones, H., Boeri, N., & Lamberson, P. (2013). Promoting the health of young adults in urban public universities: A case study from City University of New York. *Journal of American College Health, 61*(7), 422-430. http://dx.doi.org/10.1080/07448481.2013.823972

Healthy People 2020. (n.d.). Adolescent health. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/Adolescent-Health

Hill, J., Bullock, I., & Alderson, P. (2011). A summary of the methods that the National Clinical Guideline Centre uses to produce clinical guidelines for the National Institute for Health and Clinical Excellence. *Annals of Internal Medicine*, *154*(11), 752-757.

Ho, J. Y. (2013, March). Mortality under age 50 accounts for much of the fact that US life expectancy lags that of other high-income countries. *Health Affairs*, *32*(3), 459-467. http://dx.doi.org/doi: 10.1377/hlthaff.2012.0574

Hoban, M. T., & Ward, R. L. (2003). Building culturally competent college health programs. *Journal of American College Health*, *52*(3), 137-141. http://dx.doi.org/10.1080/07448480309595736

Information for the media. (2015). Retrieved from http://www.acha.org/press.cfm

Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. Retrieved from http://www.nap.edu/openbook.php?record id510027&page5R1

Irwin, M. M., Bergman, R. M., & Richards, R. (2013). The Experience of Implementing Evidence-based practice change: A qualitative analysis. *Clinical Journal of Oncology Nursing*, *17*(), 542-549. http://dx.doi.org/10.1188/13.CJON.544-549

Jackson, R., Berry, R. A., & Kennedy, M. D. (2009). The relationship between lifestyle and campus eating behaviors in male and female university students. *College Student Journal*, *43*(3), 860-871.

James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmeifarb, C., Handler, J., ... Ortiz, E. (2014, February 5). 2014 Evidence-based guideline for the management of high blood pressure in adults: Report From the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA: Journal of the American Medical Association*, *311*(5), 507-520. http://dx.doi.org/10.1001/jama.2013.284427

Kaplan, R. S., & Norton, D. P. (1992). Using the balanced scorecard—measures that drive performance. *Harvard Business Review*, *70*(1), 71-79.

Kelly, N. R., Mazzeo, S. E., & Bean, M. K. (2013). Systematic review of dietary interventions with college students: Directions for future research and practice. *Journal of Nutrition Education and Behavior*, *45*(4), 304-313. http://dx.doi.org/10.1016/j.jneb.2012.10.012

Key health data about Kentucky. (2016). Retrieved from http://healthyamericans.org/states/?stateid=KY#section=1,year=2015,code=hypertension

Keyhani, S., Kim, A., Mann, M., & Korenstein, D. (2011). A new independent authority is needed to issue national health care guidelines. *Health Affairs*, *30*(2), 256-265. http://dx.doi.org/10.1377/hlthaff.2009.0447

Kossman, S. P., & Scheidenhelm, S. L. (2008). Nurses' perceptions of the impact of electronic health records on work and patient outcomes. *Computers, Informatics, Nursing*, *26*(2), 69-77.

Laska, M. N., Pasch, K. E., Lust, K., Story, M., & Ehlinger, E. (2009). Latent class analysis of lifestyle characteristics and health risk behaviors among college youth. *Prevention Science*, *10*(4), 376-386. http://dx.doi.org/10.1007/s11121-009-0140-2

Lemly, D. C., Lawler, K., Scherer, E., Keleman, S., & Weitzman, E. (2014). College health service capacity to support youth with chronic medical conditions. *Pediatrics*, *134*(5), 885-89. http://dx.doi.org/10.1542/peds.2014-1304

Matthew-Maich, N., Ploeg, J., Dobbins, M., & Jack, S. (2013). Supporting the uptake of nursing guidelines: What you really need to know to move nursing guidelines into practice. *Worldviews on Evidence-Based Nursing*, *10*(2), 104-115. http://dx.doi.org/ezproxy.uky.edu/10.1111/j.1741-6787.2012.00259.x

Morrell, J. S., Lofgren, I. E., Burke, J. D., & Reilly, R. A. (2012). Metabolic syndrome, obesity, and related risk factors among college men and women. *Journal of American College Health*, *60*(1), 82-89. http://dx.doi.org/10.1080/07448481.2011.582208

Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., ... Turner, M. B. (2015). Heart disease and stroke statistics—2015 update: A report from the American Heart Association. *Circulation*, *131*, e29-e322. http://dx.doi.org/10 1161/CIR 0000000000000152

National Center for Health Statistics. (2014). Heart disease mortality by state:2014. Retrieved from http://www.cdc.gov/nchs/pressroom/sosmap/heart_disease.htm

National Committee for Quality Assurance. (2007). *The essential guide to health care quality*. Retrieved from http://www.ncqa.org/Portals/0/Publications/Resource%20Library/NCQA_Primer_web.pdf

National Heart and Lung Institute. (2015). *High blood pressure: Who is at risk for high blood pressure?* Retrieved from http://www.nhlbi.nih.gov/health/health-topics/topics/hbp/atrisk.html

National Institute of Child Health and Development. (2011). Study shows 19 percent of young adults have high blood pressure. Retrieved from https://www.nichd.nih.gov/news/releases/Pages/052511-young-adults-high-blood-pressure.aspx

Netsch, D. S., & Kluesner, J. A. (2010). Critical appraisal of clinical guidelines. *Journal of Wound, Ostomy & Continence Nursing, 37*(5), 470-473. http://dx.doi.org/10.1097/WON.0b013e3181edee71

Olives, C., Myerson, R., Mokdad, A. H., Murray, C. J., & Lim, S. S. (2013). Prevalence, awareness, treatment, and control of hypertension in United States counties [e60308]. *PLoS One*, 8(4), 1-8. http://dx.doi.org/doi:10.1371/journal.pone.0060308

Park, J., Mendoza, J. A., O'Neil, C. E., Hilmers, D. C., Liu, Y., & Nicklas, T. A. (2008). A comparison of the prevalence of the metabolic syndrome in the United States (US) and Korea in young adults aged 20 to 39 years. *Asia Pacific Journal of Clinical Nutrition, 17*, 471-482.

Prescott, H. M. (2011). Student bodies, past and present. *Journal of American College Health, 59*(6), 464-469. http://dx.doi.org/10.1080/07448481.2011.562579

Rao, S. P., Lozano, V., & Taani, M. (2014). Cues to healthy decision-making among college students: Results from a pilot study. *College Student Journal*, *48*(4), 697-706.

Re, R. N. (2009). Obesity-related hypertension. *The Ochsner Journal*, 9(3), 133-136.

Schaffer, M. A., Sandau, K. E., & Diedrick, L. (2013). Evidence-based practice models for organizational change: overview and practical applications. *Journal of Advanced Nursing*, *69*(5), 1197-1209. http://dx.doi.org/doi:10.1111/j.1365-2648.2012.06122.x

Schlomann, P., Virgin, S., Schmitke, J., & Patros, S. (2011). Hypertension among the uninsured: Tensions and challenges. *Journal of the American Academy of Nurse Practitioners*, *23*(6), 305-313. http://dx.doi.org/10.1111/j.1745-7599.2011.00616.x

Scordo, K. A., & Pickett, K. A. (2015). Hypertension guidelines in the spotlight. *Nursing Management*, *46*(7), 22-27. http://dx.doi.org/10.1097/01.NUMA.0000466487.00580.57

Scordo, K. A., & Pickett, K. A. (2014). Hypertension in 2014: Making sense of the guidelines. *The Nurse Practitioner*, *39*(6), 18-23. http://dx.doi.org/10.1097/01.NPR.0000446869.87081.9b

Shaw, E. K., Howard, J., Etz, R. S., Hudson, S. V., & Crabtree, B. F. (2012). How team-based reflection affects quality improvement implementation: A qualitative study. *Quality Management in Health Care*, *21*(2), 104-113. http://dx.doi.org/10.1097/QMH.0b013e31824d4984

Silverman, D. C., Underhile, R., & Keeling, R. P. (2008). Student health reconsidered: A radical proposal for thinking differently about health-related programs and services for students. *Spectrum: A Publication of Aetna Student Health*, 4-11. Retrieved from https://www.academia.edu/7170594/Student_Health_Reconsidered

Skorton, D., & Altschuler, G. (2013). How college health centers help students succeed. Retrieved from http://www.forbes.com/sites/collegeprose/2013/09/23/how-college-health-centers-help-students-succeed/#3148363335b8

Smitz Naranjo, L. L., & Kaimal, P. V. (2011). Applying Donabedian's theory as a framework for bariatric surgery accreditation. *Bariatric Nursing and Surgical Patient Care*, *6*(1), 33-37. http://dx.doi.org/10.1089/bar.2011.9979

Sood, N., Reinhart, K. M., & Baker, W. L. (2010, June 1). Combination therapy for the management of hypertension: A review of the evidence. *American Journal of Health-System Pharmacy*, *67*(11), 885-894. http://dx.doi.org/10.2146/ajhp090419

Stevens, K. R. (2012). *Star model of EBP: Knowledge transformation*. Academic Center for Evidence-based Practice. The University of Texas Health Science Center at San Antonio. Retrieved from http://nursing.uthscsa.edu/onrs/starmodel/star-model.asp

The history of ACHA. (n.d.). Retrieved September 5, 2015, from http://www.acha.org/ACHA/About/History/ACHA/About/History.aspx?hkey=29e97485-0afd-49fa-a061-b4dd3ac5fa29

Trust for American's Health. (2016). Key health data about Kentucky. Retrieved from http://healthyamericans.org/states/?stateid=KY#section=1,year=2015,code=hypertension

University of North Carolina at Chapel Hill. (2011). *Nearly one in five young adults has high blood pressure, study shows (UNC news release)* [Press release]. Retrieved from http://www.cpc.unc.edu/projects/addhealth/news/nearly-one-in-five-young-adults-has-high-blood-pressure-study-shows-unc-news-release

U. S. Department of Health and Human Services Health Resources and Services Administration. (n.d.). Hypertension Control. Retrieved from http://www.hrsa.gov/quality/toolbox/508pdfs/hypertensioncontrol.pdf

U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. (n.d.). *Healthy people 2020: Adolescent health*. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/Adolescent-Health

U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. (n.d.). Healthy People 2020. Retrieved from http://www.healthypeople.gov/2020/topics-objectives/topic/Adolescent-Health

U.S. Preventive Services Task Force. (2015). Final recommendation statement: Hypertension in adults: Screening and home monitoring. Retrieved from http://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/high-blood-pressure-in-adults-screening

Wakefield, M. K. (2008). The quality chasm series: Implications for nurses. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK2677/#ch4.s2

Weber, M. A., Schiffrin, E. L., White, W. B., Mann, S., Lindholm, L. H., Kenerson, J. G., ... Harrap, S. B. (2014). Clinical practice guidelines for the management of hypertension in the community: A statement of the American Society of Hypertension and the International Society of Hypertension. *Journal of Hypertension, 32*(1), 3-15. Retrieved from http://journals.lww.com/jhypertension/Citation/2014/01000/Clinical_Practice_Guidelines_for_the_Management_of.2.aspx

Willard-Grace, R., Chen, E. H., Hessler, D., DeVore, D., Prado, C., Bodenheimer, T., & Thom, D. H. (2015). Health coaching by medical assistants to improve control of diabetes, hypertension, and hyperlipidemia in low-income patients: A randomized controlled trial. *Annals of Family Medicine*, *13*(2), 130-138. http://dx.doi.org/10.1370/afm.1768Zelman, W. N., Pink, G. H., & Matthias, C. B. (2003). Use of the balanced scorecard in health care. *Journal of Healthcare Finance*, *29*(4), 1-16.

World Health Organization. (2007). *Prevention of cardiovascular disease: Guidelines for assessment and management of cardiovascular risk*. Retrieved from http://ish-world.com/downloads/activities/71665_71665_OMS_INT-RETIRATION.pdf

Zelman, W. N., Pink, G. H., & Matthias, C. B. (2003). Use of the balanced scorecard in health care. *Journal of Healthcare Finance*, *29*(4), 1-16.