Adoption of a Heart Healthy Diet in Rural Eastern Kentucky

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Recommended Citation
Luley, Kevin (2011) "Adoption of a Heart Healthy Diet in Rural Eastern Kentucky," Kaleidoscope: Vol. 10, Article 43.
Available at: https://uknowledge.uky.edu/kaleidoscope/vol10/iss1/43
I graduated from the University of Kentucky in December 2010 with a Bachelor of Science in Nursing. I was an undergraduate assistant with the Research & Interventions for Cardiovascular Health heart program under the guidance of Dr. Terry Lennie beginning in 2008 and I continue to be a research assistant as a graduate.

I am currently a Registered Nurse in the surgical intensive care unit at the University of Kentucky Medical Center. As an RN in the ICU, I am constantly teaching patients and their family members about what things they need to be doing after they are discharged from the hospital. This is one of the many reasons I find it important to know what patients and their families are capable of doing at home so I can best help them to modify their plan of care or help make arrangements so they can meet their goals.

Being able to go down to Perry County for this project with Dr. Lennie was a very rewarding experience. In a city the size of Lexington we tend to take for granted how much access we have to healthy food. What is a 2 or 3 minute drive or even a stroll down the street for a gallon of milk can take some in Perry County 45 minutes both ways. I have spent a lot of time in eastern Kentucky camping and hiking and I truly enjoy everything it has to offer, so to have the chance to give back to the people of this area by shedding light on this problem is incredibly rewarding.

**Faculty Mentor: Dr. Terry Lennie**

Teaching individuals strategies for self-management of cardiovascular risk factors is essential to reducing the high rates of cardiovascular disease in Eastern Kentucky. However, people derive little benefit from this teaching if environmental resources are not available to allow them to enact the strategies. The study conducted by Kevin Luley provided us with essential data and insight regarding resources available in Eastern Kentucky that allow appropriate changes in diet to reduce cardiovascular risk factors.

His data show that each person’s available resources need to be assessed and considered in the intervention. This has changed the way we approach the development and delivery of behavioral change interventions. To be effective, interventions need to target both the individual to make the desired changes and the community/local retailers to provide the resources needed to allow individuals to change their behavior.

Kevin used rigorous protocols for data collection and analysis that provides us with confidence in his results despite the relatively small sample. His study was chosen as one of only two undergraduate student oral presentations at the College of Nursing’s Annual Student Scholarship Showcase and one of a select few at the University’s Annual Showcase of Undergraduate Scholars, demonstrating the significance of his work.
Introduction

Rural Appalachian Kentucky has the highest rates of cardiovascular disease in the state according to the Center for Disease Control, 2006. Rural Appalachian counties average between 593-747 per 100,000 cardiovascular related deaths annually, (U.S. Census Bureau, 2010). Urban areas such as Lexington and Louisville average between 430-489 per 100,000 cardiovascular related deaths annually. According to the Kentucky Department of Public Health, cardiovascular related death is the number one cause of death in the state and accounts for 35% of all deaths in the state of Kentucky annually. Nationally, Kentucky is the 44th worst state for cardiovascular health in the country, 1 being the healthiest 50 being the least healthy (Department of Health and Human Services, 2010).

The primary focus of this project is to improve the quality of life and cardiovascular disease (CVD) risk factor outcomes in rural Appalachian Kentucky. According to the American Heart Association, the largest modifiable risk factor for cardiovascular disease is diet (American Heart Association, 2010). In order to help residents of this region adopt and maintain a heart healthy diet, a base line needed to be determined to find out what foods were available in this region. In order to establish this we surveyed local food retailers and restaurants in Perry County Kentucky to determine if heart healthy foods were available. To date, no other research of this kind has been done in this region of Kentucky.

Methods

This was an observational study using an ethnographic approach. Nine food retailers and six restaurants in Perry County Kentucky were surveyed using standardized survey instruments. Primary Standard Industrial Classification (SIC) codes for retail grocery stores (5411) and retail eating places (5812) were used to identify establishments in Perry County. SIC codes are a category within the Standard Industrial Classification System administered by the Statistical Policy Division of the United States Office of Management and Budget to categorize the primary business of an establishment (United States Department of Labor, 2011). The search provided company profiles that identified the type of grocery store or restaurant by SIC classification, name, store or restaurant owner or manager if a franchise, exact store location and phone number, facility size in square feet, and if the business was independent (a single location) or a chain (branch of a larger company). Retail grocers were included only if food sales were listed as the primary line of business. Therefore, stores with sales of gasoline as the primary line of business were excluded. Only restaurants that were non-franchised and locally owned were selected because menu information for franchised (chain) restaurants was available on the internet.

Store Survey

The nine stores were surveyed using an instrument that contained all food categories typically sold by food retailers. The instrument was divided into categories of fresh, frozen, or canned. We recorded whether the item was available in each category and determined sodium content of foods available as frozen or canned. Fresh foods were graded based on freshness according a numerical scale of 1, 2, or 3, with 3 being the highest quality and 1 being the lowest. Foods were assessed according to ripeness, appropriate color, whether or not they were rotting, damaged, or were in any way inedible. All of the researchers performing the survey at that time physically viewed each item being scored. Inter-rater reliability of 90% was established prior to recording assessments. All of the researchers performing the survey reached a consensus regarding the quality. Price was also recorded on each food item. It should be noted that so far, our survey has only included businesses that were open all year long. Temporary vendors such as farmers markets were not included in this data.

Restaurant Survey

Complete menus from six restaurants were collected with permission or photographed. The menus were analyzed according to the method established by Table 1 (Jones, Krummel, Wheeler, Forbes, & Fitch, 2004). Briefly, menu items for each restaurant were divided into six categories: appetizers, breakfast, lunch/dinner entrees, side dishes, desserts, and beverages. The items for each meal type were scored independently by three researchers (K.L., D.C., T.L.) according to the criteria use by Jones et al in Table 1 (Jones, Krummel, Wheeler, Forbes, & Fitch, 2004) modified to include additional criteria that met American Heart Association (American Heart Association, 2005) and USDA (United States Department of Agriculture, 2005) dietary guidelines. Researchers independently scored each menu item and then met to establish menu scoring agreement. Scores for each menu items in which there was a discrepancy were discussed until a consensus was reached. Every menu item had an inter-rater reliability of 100%. The menus were also coded for presence or absence of labels that identified food as low in sodium, cholesterol, or fat, or as heart healthy.
TABLE 1
Restaurant survey tool (sample)

<table>
<thead>
<tr>
<th>Food item category</th>
<th>Low calorie, fat, or sodium</th>
<th>Moderate to high calorie, fat, or sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>appetizers</td>
<td>Low fat cheese, fruits, steamed foods that contain low-fat items, baked chips, chips or other snacks cooked in fat substitutes</td>
<td>Pan or deep-fried foods, foods served with high fat sauces, chips</td>
</tr>
<tr>
<td>B breakfast</td>
<td>Single egg poached or hard boiled, oatmeal, cold cereals, fruits, yogurt, egg dishes or omelets made with egg whites or substitutes</td>
<td>Omelets, fried or scrambled eggs, bacon, ham, Canadian bacon, pancakes, French toast, waffles, biscuits and gravy, Texas toast</td>
</tr>
<tr>
<td>Lunch and dinner entrees</td>
<td>Grilled, broiled or baked chicken, turkey, fish, lean beef, pork, buffalo, meat substitutes, vegetarian dishes, pastas with low fat sauces</td>
<td>Steaks, prime rib, hamburger, hot dogs, corned beef, duck, goose breaded, crispy, or fried chicken and fish</td>
</tr>
<tr>
<td>Side dishes</td>
<td>Steamed vegetables, salads with low fat dressings, rice, baked potatoes with low fat dressings</td>
<td>Battered/deep fried vegetables, vegetables served in butter or fats, salads with high fat dressings, coleslaw, potatoes with high fat dressings, French fries</td>
</tr>
</tbody>
</table>

Data Analysis

The restaurant data were entered into SPSS for Windows (version 17.0, SPSS Inc, Chicago, IL). Descriptive statistics including frequencies and percentages were used to describe the results.

Results: Store Data

Only four of the seven stores that carried canned vegetables with a low sodium option. Of a total of 91 canned goods available at these stores, 18% were low sodium. Skim milk was available at 86% of the stores, however no stores carried low fat cheese and only 57% carried low fat yogurt. Sixty-eight percent of the stores offered less than half of the whole grain products specified by the survey instrument, with several carrying less than 22%. The stores offered an average of 61% of the fresh fruits listed on the survey instrument, the most offered by any store was 71% and the least offered by any store was 7.1%. The three stores that carried the greatest number of heart healthy items were located in more urban areas such as hazard that has a population 4,753 (U.S. Census Bureau, 2010). The stores with the least number of heart healthy items were located in more rural areas of the community in towns like Vicco that has a population of 438 (U.S. Census Bureau, 2010). Although freshness was a variable examined for fresh food, no significant correlation was found with the available data.
Results: Restaurant Data

None of the restaurant menus provided nutritional information. A total of 437 menu items were available at the six restaurants. Of these, only 26 (5.9%) were heart healthy. Beverages comprised 61.5% of all the heart healthy items. None of the restaurants had any labeling to identify which items could be considered heart healthy.

Discussion
Perry County, Kentucky is a small rural county in the heart of Appalachian Kentucky. It has a total population of only 29,136 as of 2009, the largest counties in Kentucky, Jefferson and Fayette, have populations of 721,594 and 296,545 respectively, (U.S. Census Bureau, 2010). During the survey, we noted that a majority of the residents live outside of the more urban areas such as Hazard, where the stores that sold the majority of heart healthy food were located. Perry County, it should be noted, has very hilly topography which makes travel time to more urban areas for frequent food purchases, consuming and impractical for many residents to travel. This forces many residents to rely on local convenient stores that stock mainly canned goods with little fresh produce or dairy.

According to the United States Census Bureau, the median household income for this region for 2007 was only $28,124 (U.S. Census Bureau, 2010). The County also has a very high poverty rate at 27.3% compared to the state average of 17.3% (U.S. Census Bureau, 2010). Canned and dry foods tend to be much less expensive than the far more nutritious options of fresh and frozen. Even if residents in Perry County had access to heart healthy foods at their local grocer, they may not be able to afford them on a regular basis. Restaurants in the area also lack a sufficient amount of heart healthy menu items.

Healthcare providers do not do a sufficient job determining what kind of socioeconomic or geographical restriction their clients may have in terms of access to healthy foods. If it is determined that a patient is going to have some kind of barrier to obtaining heart healthy foods, steps need to be taken by the healthcare provider to teach the client what options are available to them. The first step is education. In many cases food that is unhealthy ordered directly off the menu can be made healthy or at least healthier by asking to hold toppings such as mayonnaise or requesting that their item be baked and not fried. Many people are not well informed about the difference between frozen versus canned vegetables especially when fresh is too expensive or not available. It is up to the healthcare provider to educate the client on the best nutritional options based on what is available to them. Nutritional education is over looked every day in patient care and it is something that has a huge impact on the outcomes of these patients.

Private and governmental agencies need to do a better job of working with these communities as well. Tax incentives and grants can be issued to retailers for the purchase of healthier inventory or to supplement start up costs of stores that provide affordable heart healthy options. Investing money in illness prevention rather than treatment will be far less expensive in the long run. It is vital for future research to focus on how this problem can be fixed through both education and community intervention, to bring healthier options to Perry County as well as other communities in similar situations.

Conclusion

The purpose of this study was not to compare and contrast Perry County to other counties in Kentucky. Simply put, we were trying to evaluate what was available to the average citizen living in this area. What we found was that Perry County lacked an appropriate amount of heart healthy food choices. What is troubling about the data is the correlation to the area’s high rate of cardiovascular disease. It is well documented that diet plays a significant role in cardiovascular health. Although diet is a major risk factor for cardiovascular disease it is a risk factor that is modifiable. Now that we have identified that availability of heart healthy food can be an issue in Perry County, we can focus future research and resources towards solving this problem.

Healthcare providers need to do a more active role in educating patients on nutrition and utilizing the resources they have available to them. Organizations, both governmental and private, need to take more proactive measures to ensure that at-risk communities have the necessary resources to make heart healthy foods available. If we can increase the availability of heart healthy foods in areas such as Perry County, we can significantly reduce a major risk factor for cardiovascular disease.

Acknowledgements

I would like to acknowledge Dr. Terry Lennie and Donna Corley, as well as the entire RICH heart program for all of the help they gave me throughout this project. Funding for this project was provided by a Health Resources and Services Administration grant titled "HeartHealth in rural Kentucky” to M.J. Novak (PI) and D.K. Moser.

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