

Healthy Hearts

Definition of Intervention

Needs statement

Coronary heart disease (CHD) is the leading cause of death among people 65 years and older living in North Carolina.¹ CHD results from a narrowing of small blood vessels that supply blood and oxygen to the heart and includes myocardial infarction (MI), angina, and other atherosclerotic or ischemic heart diseases.² CHD results in significant mortality, morbidity and disability. CHD is also an economic burden on individuals and families. Total hospital charges for heart disease in NC exceed 1.8 billion annually, with an average cost of \$40,000 per hospital stay.²

Several factors cause rural and impoverished counties, such as Robeson County in south-central NC, to be susceptible to medical conditions such as CHD. In 2007, Robeson County's age adjusted heart disease rate was 258.0 per 100,000 as compared to the state rate of 196.5.³ Robeson County is considered a Medically Underserved Area (MUAs). MUAs are determined by four variables: the ratio of care physicians per 1,000 people, the infant mortality rate, the percent of the population below the poverty level, and the percent of the population aged 65 and older.⁴ Fewer primary care physicians in this county indicates an enhanced need for healthcare interventions. Further, the poverty rate in Robeson County is 22.4%, which is much higher than NC and U.S. averages of 13.4% and 12.5%, respectively.⁴ Robeson is considered a persistent poverty county because it has experienced high poverty rates over last 30 years.⁴ Members of communities with higher poverty often have access to fewer health resources, making intervention in these areas valuable. Illiteracy, in 19.9% of county residents in 2000 is also a barrier to typical written avenues of health promotion.⁵ In addition to categorization as a MUA, the population aged 65 and older in Robeson County is projected to grow by 50-99% in the years 2010-2030.¹ Mortality secondary to heart disease in Robeson County is among the highest of the North Carolina counties, at 254.6-358.8 deaths/year per 100,000 population.²

CHD is a preventable disease. Modification of risk factors and medical intervention can contribute to decline in morbidity, disability and mortality associated with CHD. The Robeson County Health Department Strategic plan 2011-2013 first goal is to reduce the burden of chronic

disease in residents.³ They have proposed several community programs addressing other chronic conditions such as stroke and obesity in children and adults, but they lack a program targeting community members with history or susceptibility to CHD.³ Robeson County as a MUA with a growing aging population presents with numerous unmet health needs and would benefit substantially from a community education program focusing on reducing CHD risk factors.

Healthy Hearts targets individuals in Robeson, NC directly by providing education and resources to identify and reduce three CHD health risks: smoking, reduced physical activity, and poor diet.

Background

Only with evidence-based interventions can **Healthy Hearts** attempt to produce favorable outcomes in the form of smoking cessation, activity promotion, and improved dietary consumption. Improvement in these risk factors will make the greatest impact on the CHD rate in Robeson County. The Health Belief Model (HBM) would be most applicable in promoting change in our target community. According to principals of HBM, for people to make lifestyle change that will reduce their CHD risk, they must first perceive the possible threat of CHD leading to their death, second they must perceive how they will benefit from making positive lifestyle changes and third that the reduction in this threat and addition of these benefits outweigh their perceived barriers to action.⁶ Educational interventions will help **Healthy Hearts** clients learn to avoid risky behaviors and activities, as well as give them simple and easy solutions to incorporate these behaviors and choices in their lives. Further, we will utilize principles from the Social Cognitive Theory (SCT) and motivational counseling theory in the **Healthy Hearts** intervention. SCT is based on self-efficacy, goals and outcome expectancies as part of behavior change.⁶ Evidence shows that behavioral change interventions such as the two mentioned can be used to modify behaviors that lead to chronic illness as well as to change behaviors that improve disease management.^{7,8} Motivational counseling focuses on why people change and what can be done to help them change instead of focusing on the reasons why people do not change.⁹ Motivational counseling has been found to be effective both in reducing maladaptive behaviors and in promoting adaptive health behavior change (i.e. diet and exercise).⁷

The goal of health promotion intervention is to prevent further morbidity through primary, secondary, and tertiary prevention.¹⁰ Primary prevention aims to keep as many people free of risk as possible, secondary prevention strives to minimize risk and delay disease onset in those already at risk, and tertiary prevention aims to mitigate disease progression.¹⁰ **Healthy Hearts** promotion is aimed at secondary and tertiary prevention involving a combined high risk and population approach.¹⁰ These approaches identify individuals at high risk and then protect or treat them to keep as many as possible at low risk and continue to shift the diseased population to lower risk.¹⁰

Interventions targeting multiple behaviors are emerging as a strategy to reduce the risk for cardiovascular and other diseases. This reflects the growing awareness that patients engaging in one health risk behavior are at increased likelihood of engaging in others.¹¹ In individuals with CHD risk, the most frequent cluster of risk factors are smoking, being overweight, and physical inactivity.¹¹ Addressing multiple behaviors in a primary care setting may present additional challenges such as additional time needed for a more intensive intervention.¹¹ For this reason, public health promotion programs, such as **Healthy Hearts**, present a needed health promotion opportunity to decrease this risk factor cluster in at-risk populations, such as Robeson County. Goldstein et al. report that there may be more support for offering these interventions in those diagnosed with or at high risk for CVD than currently unaffected populations, but that interventions producing small-to-moderate effects may decrease the incidence of CVD if made available to a large number of patients.¹² Villablanca et al report success using a heart disease prevention intervention built around a model of community engagement, advocacy, self-efficacy, resource knowledge, and health promotion in faith- and community-based organizations to increase cardiovascular knowledge and awareness outcomes in high-risk women.¹³ The American Heart Association released a scientific statement that will be utilized in this intervention that reviewed and graded the current scientific evidence for effective population approaches to improve dietary habits, increase physical activity, and reduce tobacco use.¹⁴

Smoking cessation is considered a “gold standard” of chronic disease interventions in terms of cost effectiveness for disease treatment and prevention.¹¹ There are numerous options available to assist healthcare providers in treating their patients who smoke, however, the strongest empirical evidence for long-term abstinence is found in brief smoking cessation

intervention and pharmacotherapy.¹¹ In addition, there is strong evidence that anti-tobacco media and educational campaigns are effective for fostering negative attitudes about smoking, reducing smoking initiation among youth, and promoting smoking cessation among active smokers, especially when sustained and when combined with other population-level strategies.¹³

A large proportion of American children and adults do not meet the minimum activity standards recommended by the Centers for Disease Control and Prevention (CDC).¹⁴ Yet, physical activity is a modifiable health behavior and one of the most effective health promotion and disease mitigation/prevention strategies to reduce multiple comorbidities, physical disability, and premature death.¹⁵ It has been shown that interventions using print and/or telephone were effective in changing behavior in the short term, and that interventions, that are tailored to the target audience, such as **Healthy Hearts**, are most effective.¹⁴

Recommending moderate-intensity physical activity (for example, a 3 to 4 mile per hour walk) can provide more options to patients, even though greater benefits are associated with vigorous-intensity activity.¹¹ It is important to consider physical activity on a continuum where every increment of change in behavior is valued.¹¹ It has been shown that a 14-week intervention of moderate intensity, shorter duration exercise 3 days a week elicits greater improvements on selected coronary risk factors compared with low intensity, long duration aerobic exercise and conventional nonaerobic therapeutic exercise consisting mainly of strength, balance, and range of motion activities.¹⁴ Villablanca reports that focused media and education strategies improve awareness and attitudes about physical.¹³

Nutrition has a major role in protecting health and slowing disease progression.¹⁰ Nutrition screening and interventions when coupled with other effective therapies, are cost-effective and result in fewer complications, faster recovery, shorter hospital stays, and reduced hospital expenditures.¹⁰ Due to physiologic, functional, and lifestyle changes in individuals greater than 70 years old, it is clear that nutrient standards for aging adults are different, therefore the Institute of Medicine at the National Academy of Sciences and Health Canada developed new Dietary Reference Intakes which include specific standards for those over 70.¹⁰ Large-scale, system-based, low-intensity strategies, such as the Harvard Pilgrim Health Care Health Maintenance Organization network, have improved the diets of primary care patients.¹³ In addition, research has demonstrated that dietary interventions designed for patients of low

socioeconomic status (SES) can effectively decrease risk for CVD, as demonstrated by the Food For Hear Program which was designed for low-income and low-literacy adults.¹¹ Pignone and coworkers reviewed randomized controlled trials and indicated that dietary interventions were able to produce modest changes in saturated fat, fruit and vegetable, and fiber consumption.¹⁶ In addition, they noted that more intensive intervention or those designed for patients who had a known CVD risk factor produced greater impact on dietary behavior.¹⁶ Lastly, Villablanca reports that the evidence from ecological studies, quasi-experimental studies, and cluster-randomized trials indicates that focused national, community, and school-based media and educational campaigns are effective in increasing knowledge and consumption of specific healthful foods.¹³

Overall, community based approaches seem to be the most effective, and providing education geared towards modifiable risk factors seems to be beneficial in most communities.¹⁰⁻¹³ Research gaps include multicomponent strategies, which appear promising but need further investigation to confirm effectiveness; appropriate work-site interventions to increase physical activity; and financial and economic effects of several strategies.¹¹ Additionally, more studies are needed regarding the effect of altering the local community environment to influence diet and physical activity.¹¹

Intervention Description

Objectives

1. Participants will take part in a screening examination at the beginning of the workshop to identify presence of following risk factors: smoking, reduced physical activity and poor diet.
2. Participants will record one or more of modifiable risk factors they wish to improve upon, based upon screening results, personal preference and willingness to change in post-program survey completed at end of workshop.
3. Participants will self-report at least a 50% improvement in understanding of how smoking constitutes as a modifiable risk factor in CHD and an awareness of resources available to assist them should they decide to reduce or stop smoking. Participants

understanding will be evidenced by responses on the two post-program surveys (one at end of workshop and second after 6 months).

4. Participants will self-report at least a 50% increase in knowledge of role of healthy diet in prevention of CHD demonstrated by their responses on the two post-program surveys.
5. Participants will self-report at least a 50% improvement in understanding of benefits of physical activity and maintenance of a healthy weight in prevention of CHD onset and progression as demonstrated by their responses on the two post-program surveys.
6. Participants will participate in at least 75% of 20-minute physical chair exercise program.
7. Participants self-report at least a 50% increase in understanding of importance of monitoring blood pressure levels and lipid panels in order to decrease CHD risk factors and disease progression as evidenced by responses on the two post-program surveys.
8. Participants will self-report at least a 50% improvement in knowledge of signs and symptoms and recommended course of action following onset of CHD as demonstrated by their responses on the two post-program surveys.

Methods

Healthy Hearts is a one-day 5-hour workshop at the Pine Street Senior Activity Center in Lumberton, Robeson County. The first hour will consist of a screening session for participants conducted by physical therapists and registered nurses. The screening will include measurements of weight, height and blood pressure and patient self-reports of nutrition habits, physical activity level, and any smoking history. Following the screening, participants will sit for a lecture discussing the modifiable risk factors, which will finish with an opportunity for participants who currently smoke to sign the pledge for cessation. A heart-healthy lunch will be provided, during which a registered dietician will discuss the importance of diet and make recommendations to incorporating these options in their everyday diet easily and affordably.

Following lunch, participants will be educated on signs and symptoms of heart disease and the importance of physical activity. Participants will be walked through a simple 20-minute home exercise chair program including five total body stretches and ten lower and upper extremity strengthening exercises. (Appendix 1) Participants will be provided with a theraband for use with the strengthening program. Then resources and suggestions of activities in their

local community will be provided and participants will be encouraged to engage in these activities. Lastly, the importance of regular screening and obtaining further in-depth diagnostic laboratory tests for heart disease will be discussed. Hard copy resources and pamphlets will be provided to all participants to correspond to each section of our program workshop. (See Appendix 2 for sample resource pages provided to participants)

Intervention Evaluation

Assessment

Three total assessments will be completed (at baseline, at end of the workshop, and 6 months after the workshop) to determine **Healthy Hearts** impact and effectiveness. A participant self-report baseline survey will be administered during first hour of screening recording nutrition habits, physical activity level and any smoking history. This pre-intervention survey will also include questions rating the participant's willingness to change and self-efficacy.

We will administer a survey at the end of the workshop and mail out a survey 6-months after to all participants. Use of a survey (Appendix 3) on the day of the workshop will quantify participants' perceived change in knowledge of risk factors, signs and symptoms of CHD, importance of CHD screening and the importance of smoking cessation, physical activity and diet modifications. It will also assess the participants' willingness to change and self-efficacy, record any pledges participants make to change risk behaviors over next several months, and include an evaluation of the workshop. The 6-month post survey will include self-report of current nutritional habits, physical activity level, and any smoking history to determine if the participant has been successful in making any modifications to their risk factors since workshop. Phone calls will be made at 2-weeks after workshop to follow-up with participants who signed a pledge to change their risk factors. During calls participants will be provided with encouragement, further advice, and resources and willingness to change and self-efficacy will be re-evaluated.

Limitations

A possible limitation of **Healthy Hearts** is uncertainty about quality of participant referrals that will be generated from Pine Street Senior Activity Center in Lumberton, Robeson

County. There may be a selection bias towards healthy-minded and literate older adults enrolling in workshop. This could limit **Healthy Hearts** ability to reach the target population, those aged 65 and older with highest CHD risk in Robeson County. We do not have information regarding the interest level of Robeson County community members in participating in a daylong workshop, but anticipate that a free lunch and screening will provide an incentive to attend. Further, another significant limitation will be the self-report nature of the three assessments used to detect participants' changes in knowledge about risk factors, general knowledge of CHD, willingness to change and self-efficacy, and pledges to change their behavior.

Relevance

Hopefully, we will be able to decrease the modifiable risk factors or at least reduce some of the negative health behaviors in the aging population Robeson County NC. If this pilot of **Healthy Hearts** proves to be feasible and effective, it can be reproduced in senior citizen centers serving similar underserved aging populations with high incidence of heart disease, such as those in neighboring Bladen and Columbus counties in NC. If successful throughout North Carolina, **Healthy Hearts** has potential to be expanded to other centers across the United States

References

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APPENICES:

Appendix 1: Healthy Hearts Home Exercise Program (pg 10)

Appendix 2: Sample Resource Lists Provided to Participants (pg 13)

Appendix 3: Healthy Hearts Post-Workshop Questionnaire (pg 15)

Appendix I:

Healthy Hearts Home Exercise Program

Stretches

1. **Seated Hamstring Stretch:** sit on edge of chair with heel on floor or stool. Keeping your knee straight, lean forward over leg until stretch is felt in hamstrings. Hold the stretch for 20 seconds, repeat 3 times on both the right and left legs.



2. **Quad Stretch in Standing:** Hold onto chair with one hand. Bend knee back behind and hold your ankle/foot with the other hand. Gently pull your knee into a more bent position towards your buttocks. Hold the stretch for 20 seconds, and repeat 3 times on both the right and left legs.

3. **Shoulder Stretch:** bring your left arm across your body and hold it with your right arm, either above or below the elbow. Hold for 20 seconds. Switch arms and repeat. Do 3 times on both arms.



4. **Upper Back Stretch:** Stand in relaxed position with your arms extended in front of you, parallel to the floor (top image). Pull your shoulder blades together behind you (as if you are going to pinch a ball between your shoulder blades). Hold for 20 seconds and then relax completely. Repeat 3 times.

5. **Neck Stretch:** Bend your head forward and slightly to the right. With your right hand, gently pull your head downward. You'll feel a nice, easy stretch along the back left side of your neck. Hold for about 30 seconds and repeat 3 times. Repeat to the left.



Upper & Lower Body Strengthening

1. **Walk in place:** Perform 3 minutes of self-paced walking in place, emphasizing movement of upper extremities in rhythm with the lower extremities. This will get your heart pumping and warm up those muscles for the rest of the program.

2. **Seated leg extensions:** While seated with your knee in a bent position, slowly straighten your knee as you raise your foot upwards as shown. Hold for a few seconds and then slowly lower your leg back down towards the chair. If your foot is hitting the ground, a towel can be rolled up and put underneath the thigh to improve the exercise. Repeat 30 times.



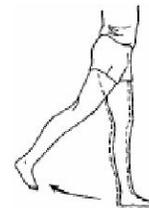
3. **Standing hamstring curl:** While standing, bend your knee so that your heel moves towards your buttock. Repeat 30 times. Do both the right and left legs.

4. **Squats:** While standing with feet shoulder width apart stable support for balance (you can hold onto your chair in both hands), bend your knees and lower body towards the were going to sit down into a chair behind you. Your body mostly directed through the heels of your feet. Your knees the front of your foot. Return to standing. Repeat 30 times.



and in front of a front of you with floor, as if you weight should be should not pass

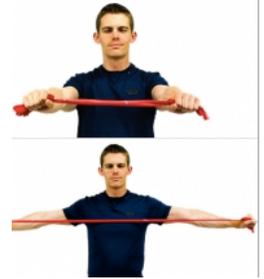
5. **Standing hip extensions:** While standing and holding onto the back of your chair, keeping your leg and knee straight, kick your leg behind you as shown in the picture. Slowly bring your foot back to the start position and repeat 30 times. Repeat with opposite leg next.





6. **Seated Marching:** While seated in the chair, draw your knee up towards the ceiling, then set it down, and repeat with the opposite knee. Alternate back and forth until you have done both knees 30 times.

7. **Elastic Band Bilateral Horizontal Abduction/Adduction:** While holding the elastic band with your elbows straight and in front of your body, pull your arms apart and towards the side. Stop when both of your arms are directly at the sides of your body, and slowly return to starting position. Do not let the force of the band bring your arms back together. This is part of the exercise. Repeat 30 times.



8. **Elastic Band Flexion:** While holding the elastic band in front of you and on your leg with your opposite arm, pull the band upward towards the ceiling with your working arm as shown. Stop when your arm is at your head. Slowly lower the band back to the starting position, and repeat 30 times. Repeat with the opposite arm.

9. **Bent over rows:** while standing with one hand on the chair back, bend over and starting with your arm at your side, draw up on your arm as you bend your elbow, bringing your elbow towards the ceiling. You can do this exercise without anything in your hand, or you can use a can of soup, or you can use your elastic band. If using your band, you must step on the band, and be sure that you have your band secure under your foot. Repeat this exercise 30 times and do both the left and right arms.

10. **Elastic Band Rotations:** While seated, step on the elastic band with both feet so that you are holding both ends of the band in both hands with your arms out in front of you (as shown in the picture, but replacing the ball with your band). Slowly bring your arms and trunk to the left, bracing your stomach muscles. Slowly return to the center. Slowly bring your arms and trunk to the right, and return to the center. Repeat this 15 times.



Pictures obtained from HEP2GO and the Mayo Clinic Websites^{1,2}

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APPENDIX 2

STAYING HEALTHY BY STAYING ACTIVE!



Check out these LOCAL resources available to you right now!

- **Lumberton Recreation Department:** a system of parks, playgrounds with nature trail system and picnic facilities, and programs. Located at Bill Sapp Center located at 1100 North Cedar Street. Operating hours for the main office are Monday through Friday, except holidays, from 8:00 a.m. until 5:00 p.m. The gym inside the facility is available for open play most days between 9:30 a.m. and 4:30 p.m. (910) 671-3869; (910) 671-3889; <http://www.ci.lumberton.nc.us/index.php/departments/recmain>
 - Adult Softball: For ages 18+, both men and women Season: May-August Locations: Fairmont, Maxton, Pembroke, Red Springs, St. Pauls. Contact Lumberton Recreation Department for details.
- **Luther Britt Park.** Located in West Lumberton. It offers two lakes, totaling 35 acres of water that allow for fishing, swimming and boating.
- **Pine Street Activity Center** (Barker Ten Mile Community Center). Houses Senior Citizen programs offered by the Lumberton Recreation Department. Offers various weekly activities for senior citizens of the county and Senior citizen trips sponsored by Robeson County Recreation Department throughout the year. Center also offer rental of ball fields and canoes.
- **Parkview Activity Center** offers youth programs, a gym, pool tables, ping-pong tables, a weight room and activity rooms.
- **Southeastern Lifestyle Center for Fitness.** This is a private medically-based fitness facility with locations in Lumberton and Red Springs. They offer indoor swimming pools, whirlpools, dry saunas, racquetball courts, an indoor basketball court, an indoor walking track, cardiovascular equipment, strength training machines, and a variety of free weights. Aerobic classes such as Aqua zumba, water aerobics, Zumba, Yoga, Power Burn, Step and more are also offered. Child watch services are also provided. 4895 Fayetteville Road, Lumberton, NC 28358; (910) 738-5433; <http://www.srmc.org/main/fitnesshome.html>
- **Total Elite Fitness Center.** Private fitness facility offering resistance training equipment, cardiovascular equipment, group exercise and aerobic classes, steam and sauna and child

care. 3501 Fayetteville Rd. Lumberton, NC 28358; (910) 671-9373;
www.totalelitegym.com

- **SilverSneakers** is an energizing program offered to older adults who are eligible for Medicare or group retirees. It encourages you to take greater control of their health by encouraging physical activity and offering social events. It provides access to conditioning classes, exercise equipment, pool, sauna and other available amenities. Also access to aerobic classes designed for strength, flexibility, balance and endurance in older adults. Optional health education seminars and other events that promote the benefits of a healthy lifestyle are offered. Also, online support to lose weight, quit smoking and reduce your stress levels is offered. Most healthcare programs offer SilverSneakers. Call 1-888-423-4632 (TTY: 711) to determine your eligibility or go online at <http://www.silversneakers.com/TellMeEverything/WhatisSilverSneakers.aspx>

ONLINE RESOURCES: Available to Anyone with Internet Access!



- **American Heart Association** website located at www.heart.org has a variety of resources available surrounding nutrition, weight management, stress management, quitting smoking, and getting physically active.
- **North Carolina Heart Disease and Stroke Prevention Program (NC HDSP)** website is located at www.startwithyourheart.com and highlights state-wide resources that you can look up and access in your community. Also, there are numerous resources provided that attempt to provide advice for a healthier lifestyle.
- **A Million Hearts** is a nation-wide initiative begun by the Centers for Disease Control to lower blood pressure and reduce risk of heart disease and stroke. The website can be found at <http://millionhearts.hhs.gov/index.html> and has a multitude of resources for heart-healthy lifestyle interventions.
- **Centers for Disease Control: Division for Heart Disease and Stroke Prevention** website can be found at <http://www.cdc.gov/dhdsp/> and spotlights many resources and informative publications for managing a healthier lifestyle.
- **North Carolina Administration on Aging Health, Prevention, and Wellness Program** at <http://www.ncdhhs.gov/aging/livinghealthy/livinghealthy.htm> will allow you to find *Living Healthy* and *Living Healthy with Diabetes* workshops near you, as well as provide state-wide resources.
- **Eat Smart and Move More** at <http://www.myeatsmartmovemore.com/> contains tips and tools that will help you eat smart and move more and improve your health.
- **NC Quit Line** at <http://www.quitlinenc.com/> has resources to help you quit smoking.

APPENDIX 3

Healthy Hearts

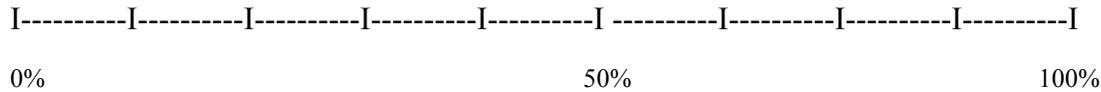
POST-WORKSHOP QUESTIONNAIRE

Congratulations and thank you for working so hard today!

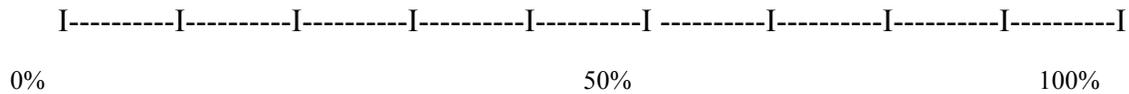
Please reflect on this workshop. We will keep your responses **confidential**. Please complete the questions below, slip them into the envelope provided and put them in red box on your way out.

A) Please rank how much more you feel you understand the following topics after today's workshop compared to what you knew before workshop. Grade from 0% (no change) to 100% (completely changed)

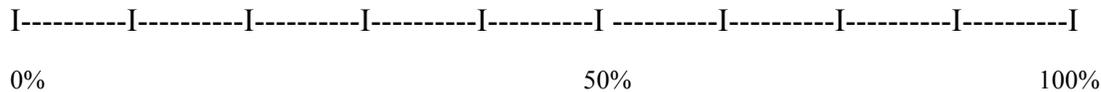
1. Common risk factors for Coronary Heart Disease (CHD)



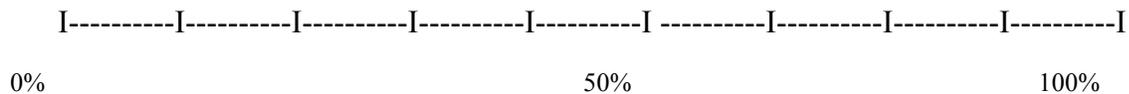
2. What types of foods are found in a heart healthy diet



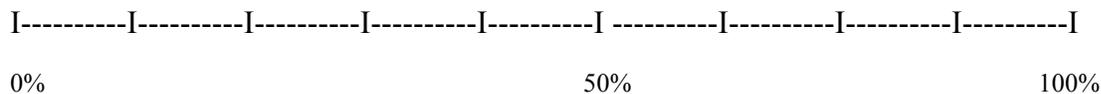
3. How physical activity can help maintain healthy weight and prevent CHD



4. How to perform a chair program for physical activity



5. What the symptoms of heart problems are and when you should see doctor or go to emergency room.



F) Please select on scales how true the following statements are for you.

I can always manage to solve difficult problems if I try hard enough.

I-----I-----I-----I-----I

Less True

More True

It is easy for me to stick to my aims and accomplish my goals.

I-----I-----I-----I-----I

Less True

More True

Thanks to my resourcefulness, I know how to handle unforeseen situations.

I-----I-----I-----I-----I

Less True

More True

I can solve most problems if I invest the necessary effort.

I-----I-----I-----I-----I

Less True

More True

I can usually handle whatever comes my way.

I-----I-----I-----I-----I

Less True

More True

G) Indicate your general satisfaction with this workshop by circling the appropriate number:

Very dissatisfied

Very Satisfied

1 2 3 4 5 6 7 8 9 10

Comments to explain your rating:

Self-efficacy portion adapted from Schwarzer R and Jerusalem M. Generalized Self-Efficacy scale. 1995 In J. Weinman SW and Johnston M. *Measures in health psychology: A user's portfolio. Causal and control beliefs.* Windsor, UK. 1995: 35-37.