Translational Research: Its Role and Significance in Providing Better Health Care for the Masses (Daniel F. Sarpong, Ph.D.)

I am certain that most of you have heard "do not pour that grease in that kitchen sink for it will clog it." Some persons automatically refrain from such behavior religiously. However, when we get health messages such as "do not eat too many fatty foods for they will clog your arteries," we do not seem to respond in the same way as with not clogging the kitchen sink with grease. Why is that? That is the question that we each need to think about and offer our own special answer where we live our lives. However, it is important to note that though we can easily change the pipes (plumbing) in our homes (place of residence) the same is not true for replacing our arteries. So what has this got to do with translational research? Well, translational research is a way of ensuring that scientific knowledge gained is shared in a way that new knowledge is generated and/or lives are improved or enhanced. Also, the improvement of human health requires the translation of scientific discoveries into practical applications.

In an attempt to provide a scientific definition of translational research, I will share an adaptation of a definition by The Translational Research Working Group (TRWG) of the National Cancer Institute of the National Institutes of Health (NIH). TRWG defines Translational Research as the transformation of scientific discoveries arising from laboratory, clinical, or population studies into clinical applications to reduce cancer incidence, morbidity, and mortality. The diagram below shows how information gained in scientific laboratories, clinical research and population studies (such as the Jackson Heart Study) are related and how the exchange of such information in the three areas is related and enhances scientific knowledge. The enhanced knowledge in turn helps in the development of new tools and applications, which lead back to new discoveries in the scientific laboratories, clinical research and population studies. Figure 1 below is a graphic illustration of the definition given above[1].

Figure 1

The ability to use knowledge gained from research to the betterment of the human condition is a major concern of the world's largest research system, the National Institutes of Health (NIH) which funds the Jackson Heart Study. In examining the NIH Core Strategic Vision[2], which states:

- Transform medicine and health from a Curative to a Preemptive paradigm,
- Support basic research to identify the earliest molecular stages of disease in complex biological systems,
- Accelerate translation of findings from the bench to the bedside, and to the community, and
- Provide the evidence and knowledge base to allow for a rational transformation of our healthcare system.

I am certain that at this juncture you are wondering, how the Jackson Heart Study is utilizing translational research to enhance the health of its cohort community? The Jackson Heart Study deems translating as one of its main goals and missions and thus is utilizing translational research at different fronts. Healthy lifestyle tips and findings from the study are shared annually through three major events: The Celebration of Life in February, Community Monitoring Board in June, and Family Reunion (participant birthday celebration) in September. There are myriad other outreach activities in the community like health fairs, the "Know Your Numbers" campaign, the training and collaborative work of the Jackson Heart Study Community Health Advisors, and joint ventures with faith-based and community-based and local and national health organizations.

For translational research to really impact the health of humanity the practical application of gained knowledge or discoveries should filter down to individuals in the community (you and I). So the challenge is; how do you become an agent of change using translational research? Do not look surprised! Yes, you can be a part of this mission. How? The next time you learn a healthy tip, do not keep it to yourself; share it with family members, friends and neighbors. We know walking is good for us so the next time you go for a walk invite a family member, a friend or the neighbor you are trying to know. To summarize, we could say that translational research sums up to "pass it on." Let's pass it on so every generation can benefit from the work, toil and knowledge of the previous one. To do otherwise is to contribute to society's dying. You would not want that for your descendants, so "pass it on!"

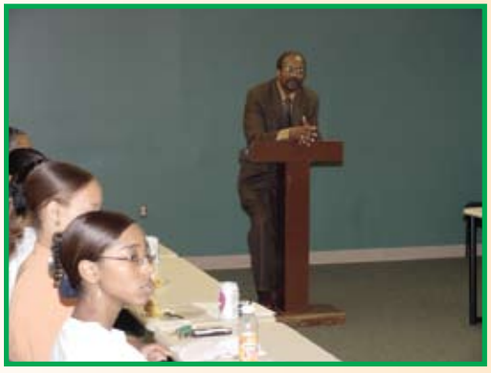
1 http://www.cancer.gov/trwg/TRWG-definition-and-TR-continuum

2 http://www.nih.gov/about/director/newsletter/Spring2007.htm

Special Invitation Inside

Translating Research into Practice and Prevention (TRIPP): A Key JHS Service to the Stakeholder Communities

The Jackson Heart Study (JHS) is a research study not directly involving any treatment of participants. However, from the inception of the study, we recognized the importance of community outreach, health promotion, health education and involvement of both the general and professional communities in around the Jackson area in our endeavor. One of the ways we originally sought to address this was through the establishment of the Partnership for Community Awareness and Health Education (PCAHE) office.



Dr. Randall at 2004 birthday celebration

During the past decades, researchers have provided evidence to support the notion that the social environment in which people live, as well as their lifestyles and behaviors, can influence the incidence of illness within the population (IOM, 1998). They have also demonstrated that a population can achieve long- term health improvements when people become involved in the community and work together to effect change.

The Community-Based Participatory Research (CBPR) Model upon which the PCAHE is based has proven to be an effective way to ensure that the community being studied is a stakeholder in the research endeavor. This Office played a significant role in the recruitment of the JHS cohort of 5302 participants and the community's buy-in of the study. The six aims for community outreach and promotion are as follows:

- To build alliances with faith-based, community, medical, and professional organizations in increasing awareness of cardiovascular diseases (CVD) and behavior modification for heart healthy lifestyles.
- To provide technical assistance to community and faith-based organizations in developing self-sustaining health promotion programs.
- To conduct community-wide assessment of the prevalence of CVD risk factors and the facilitators and barriers to behavior modifications for heart healthy lifestyles.
- To increase the number of CVD and "Know Your Numbers" (KYN) CHAN trainings.
- To use data to plan and implement community outreach and health promotion activities, and
- To conduct formal evaluations of all health education and promotion activities.

We soon realized that in addition to the work of the PCAHE, another very important way of keeping our stakeholder communities involved and up to date on the results of their involvement with the JHS was by informing them of the research findings of the JHS published in medical journals and the promotion of other easily communicated heart health findings. Since most of these publications were written in medical language we knew that for them to be useful to the public we had to translate them into layman's language and do summaries and/or hold seminars for the medical profession. This led to the formation of a subcommittee of the JHS Steering Committee, for Translating Research Into Practice and Prevention (TRIPP). We made it a requirement that all JHS manuscripts submitted for publications should have a layman's summary.

The TRIPP subcommittee embarked on its first venture with the promotion of its Whole Grain Campaign as part of the JHS birthday celebration of September 2005. To complement this, we had as our guest speakers the husband and wife team of Dr. and Mrs. Randall (a cardiologist and a chef) who wrote the book *Menu for Life*. Since then we have incorporated into our other annual community-oriented events, Celebration of Life in February and Community Monitoring Board in June, TRIPP features on obesity and more recently vitamin E. Our Celebration of Life in February 2008 featured presentations by the following JHS authors: Dr. Clifton Addison presented on **Examining the usefulness of "Approach to Life B" Questionnaire as a Valid Measure of Jackson Heart Study Participants' Coping Behavior**; Dr. Sharon Wyatt's **Hypertension in the Jackson Heart Study**; Dr. Jim Wilson's **A region of the Genome that is Responsible for Low Numbers of White Cells in Many African Americans** and Jared Taylor's **JHS Data Book**. Lay summaries of these articles are presented in this edition of the JHS Heartbeat for your review and utilization. At this year's Jackson Heart Study Family Reunion some of our participants will validate the ultimate value of translating research into practice; they will provide testimonies of how their Jackson Heart Study CT findings changed their lives.

JHS Scholars at 2004 birthday celebration

Nationally, the translation of research into practice and prevention is receiving increasing emphasis as the National Heart, Lung, and Blood Institute strives to improve the cardiovascular health of the nation. The JHS is playing its part in this venture for its stakeholders.

Psychometric Evaluation of the Coping Strategies Inventory Short Form (CSI-SF) in the Jackson Heart Study Cohort

(Clifton C. Addison, Brenda W. Campbell-Jenkins, Daniel F. Sarpong, Jeffery Kibler, Madhu Singh, Patricia Dubbert, Gregory Wilson, Thomas Payne, Herman Taylor)

Introduction

Cardiovascular disease (CVD) remains the number one cause of death in the United States. Some of the risk factors for coronary heart disease (CHD) and stroke are well known, and many studies are interested in conducting long term examinations of CVD risk in African Americans to find out about other hidden risk factors because death rates for CVD in the U.S. are disproportionately higher for African Americans. Researchers believe that a good understanding of psychosocial factors, such as how people cope with stressful situations in their daily lives, could help us better understand the relationship between cardiovascular risk and health since the ability to cope with stress-causing factors in our environment ultimately affect health and quality of life. The reasons why, in the past, fewer African-Americans than whites have survived chronic diseases include lack of education, lower socioeconomic status, inadequate medical insurance, and limited access to healthcare. The difference in survival of chronic disease between African Americans and whites has been linked to differences in coping strategies employed by these two groups. Coping refers to methods that individuals use to respond to stressful events occurring in their lives.

The original Coping Strategies Inventory (CSI) was developed to place coping responses into categories based on the way an individual responds to events. Coping efforts are categorized into two (2) main groups, Engagement strategy and Disengagement strategy. Engagement strategy refers to actions by individuals that seek to actively deal with stressors. Such actions, it is believed, will reduce the long-term psychological effect. Disengagement strategy (avoidance) relate to actions that seek to remove oneself from exposure to the stressful event. While this type of action may produce desirable short-term effects, it could sometimes lead to longer-term problems, including depression and other health issues. These two categories (engagement and disengagement) are further divided into two sub-categories, Problem-focused or Emotion-focused, Engagement and Problem-focused or Emotion-focused Disengagement. Emotion-focused coping refers to internal control of one's thinking and one's response, whereas Problem-focused coping refers to the individual's attempts to engage in some definite action to control the effects of the stress-producing situation.

African Americans are exposed to a great deal of stress-producing situations in everyday life, but relatively little is known about their patterns of coping. When faced with stressful life circumstances, most people react by thinking about the situation and/or taking some definite action to reduce the effects of those experiences. This study was designed to examine the psychometric properties of the Coping Strategies Inventory Short Form (CSI-SF), a questionnaire that was administered to the Jackson Heart Study African American cohort to examine their coping habits. Psychometric properties refer to a set of standards and procedures contained within a questionnaire that enables one to judge the trustworthiness and quality of a questionnaire or survey. The goal of establishing psychometric properties was to determine if the questionnaire used to gather information about the coping skills of the JHS cohort was actually capable of gathering accurate information about the true coping strategies of this cohort.

Methods

The participants of this study comprised the Jackson Heart Study (JHS) cohort of 5302 African American men and women between the ages of 35 and 84 who are residents of Hinds, Madison and Rankin counties. This sample comprised Atherosclerosis Risk in Communities (ARIC) participants, random selection participants, volunteers and family participants—immediate relatives of recruited participants. There were 931 participants in the random group, 1570 in the volunteer group, 1185 in the ARIC group, and 1626 in the family group, making a total of 5302 in the sample.

The CSI was originally constructed as a 78-item questionnaire and was selected because it was believed to adequately examine the coping habits of individuals. The original CSI was shortened to a 16-item version for use in the JHS. A four point Likert scale was used to record the participants' responses. Respondents were asked to rate the general frequency with which they utilized each listed coping strategy on the survey and to indicate their choices in the following manner: 1 = "Never", 2 = "Seldom", 3 = "Sometimes", 4 = "Often", and 5 = "Almost Always".

Participants received scores for each of the two overall categories (Engagement and Disengagement. Scores ranged from 8 – 40. Scores were also assigned for each of the four subscales (Problem-Focused Engagement, Problem-Focused Disengagement, Emotion-Focused Engagement, and Emotion-Focused Disengagement. The range of scores for these sub categories was 4–20. Each of the four sub categories contained four items each.

Participants of the JHS were instructed by Jackson Heart Study Home Induction Interviewers to complete the CSI-SF at home, prior to their clinic exams, and deliver it at their clinic exam visit. At that visit, an interviewer reviewed the form for completeness and to ensure that the participant had a clear understanding of instructions and content. Interviewers were instructed to read instructions and questions aloud if the participant had difficulty fully understanding the instructions and procedures.

Statistical Analysis

The analyses conducted examined whether this new reduced 16-item CSI-SF instrument used in the JHS maintained the same usefulness as the original CSI in identifying the coping habits of the JHS cohort. Preliminary analysis was conducted to ensure that the data collected truly represented the JHS cohort and would not produce biased results. Two other types of analyses were conducted. Exploratory factor analysis (EFA) was done in first stage to examine whether each item included on the revised 16-item CSI-SF should be used and to delete items that did not accurately represent the coping characteristics of the JHS cohort. Confirmatory factor analysis (CFA) was conducted in the second stage to ensure that the overall questionnaire was adequate for measuring the JHS participants. The next procedure used was a structural equation modeling (SEM) procedure which examined the relationship among all the variables simultaneously. The Pearson correlation coefficient was computed to determine the relationship between the categories and sub categories of coping.

Results

The CSI-SF was given to all 5302 enrolled participants in the JHS. Of these participants, 81.4% provided a completed measure, while 18.6% did not. Analysis was computed on gender, educational level, and income level of the participants to examine possible bias in the answers of those participants who responded to the CSI-SF and those who did not. Even though there was some difference in the responses based on gender, education level, and income, the difference was not enough to impact the strength of the survey.

Analysis was computed for each of the four sub-categories and the two main categories of the CSI-SF, which were Problem-Focused engagement, Problem-Focused Disengagement, Emotion-Focused Engagement, Emotion-Focused Disengagement, and Engagement and Disengagement to estimate the reliability of these items for use as a measurement tool. All categories had acceptable levels of reliability.

All of the questionnaire items on the CSI-SF, except for item #16, met the criteria, indicating that each measure was contributing towards the measurement of coping. Because item #16, "I keep my thoughts and feelings to myself", did not have an acceptable measurement level for inclusion, the decision was made to remove this item as a measure of coping in the JHS cohort, making the Coping Strategies Inventory Short Form (CSI-SF) a 15-item instrument.

Conclusion

This study provided evidence that the items in each sub category of the CSI-SF are measuring the coping behaviors of the JHS cohort. They have good reliability in effectively measuring each individual sub category. All of the analyses conducted supported its use as an adequate measure. The large number of participants and the large number of responses examined substantially improved the chance of achieving confidence in the analyses. All of the analyses conducted satisfied the range requirements that many researchers believe are adequate. This instrument seems to adequately identify the same dimensions of coping that were earlier projected through the original 78 item questionnaire. Some of the reliability measurements for the sub categories scales were not as strong as others in establishing sound reliability, which could be viewed as a limitation. However, the four sub-categories and the two main categories of coping, Problem-Focused engagement, Problem-Focused Disengagement, Emotion-Focused Engagement, Emotion-Focused Disengagement, and Engagement and Disengagement were adequate for acceptance of the CSI-SF as a valid measure of the coping strategies of the JHS cohort.

Information taken from the International Journal of Environmental Research and Public Health*, 2007, 4(4), 289–295*

Translating Research Into Practice and Prevention (TRIPP) Update

(Frances Henderson, Ph.D.)

One of the truly unique achievements of the Jackson Heart Study (JHS) has been the establishment of the participants and community as co-investigators. This relationship is cemented in the various components of the study. The Council of Elders, Jackson

TRIPP whole grain display—Celebration 2004

Heart Study's Community Health Advisors (CHAs) and Community Partnership Committee have helped us develop consent forms, recruitment policies and health education strategies.

Seeking to enhance the relationship among the cohort, community and JHS investigators, the Jackson Heart Study's Steering Committee formed the Translation Subcommittee in January 2004. The new subcommittee was named Subcommittee on Translating Research Into Practice and Prevention (TRIPP). The TRIPP subcommittee has been actively implementing the following charges:

- Translating research affiliated with the Jackson Heart Study into practice for health professionals and the lay public,
- Developing and conducting lay-lecture series using research findings, and
- Locating and applying to public and private funding sources to support the goals of the subcommittee

Active TRIPP translation education campaigns using ARIC and Jackson Heart Study findings are: *Whole Grain Foods Make Healthy Hearts*, *Heart Disease Risk Factors Associated with Obesity and Vitamin E (Tocopherol) Use*. Table displays and flyers from the campaigns have been presented throughout the Metro Jackson cohort area during health fairs, community walks and health forums.

Wishing to strengthen our commitment to interpreting, communicating and disseminating the scientific information we are discovering at the Jackson Heart Study, we reorganized the TRIPP subcommittee May 16, 2008. Reorganization included naming a new chairperson and revisiting the purpose of the subcommittee. Our new chairperson, Dr. Evelyn R. Walker, will concentrate on the above charges but has also added:

- Locating, translating, publishing and disseminating articles that are applicable to our cohort in the JHS newsletter.

Reorganizing the TRIPP subcommittee brings the Jackson Heart Study staff full circle with one of its major objectives: maintaining an unbroken, continuous, conscientious, communication chain among participants, community and investigators.

Vitamin E in the Jackson Heart Study (To-co-pher-ol)

(Summary supplied by Sonja Fuqua, Ph.D.)

What is tocopherol?

Tocopherol is one of the fat-soluble vitamin nutrients required by the body to help maintain normal body function. It exists in eight forms.

- α (alpha)-tocopherol—The most active form in the human body
- γ (gamma)-tocopherol—The major form in the U.S. diet

Vitamin E, according to some research studies, has shown an association with prevention of heart disease and cancer, and it has been shown to promote improved immunity to disease. In particular, α-tocopherol has antioxidant properties, and neutralizes free radicals to prevent damage to cell membranes. Alpha-tocopherol also has been shown to inhibit platelet aggregation, which is involved in blood clotting. This property is seen as protective against clot formation that can lead to heart attacks.

A JHS sub-study was conducted using three dietary assessment tools (the 24 hour recalls, the short food frequency questionnaire, and the long food frequency questionnaire). The mean dietary intake of α-tocopherol ranged from 6–8 mg/day.

- Based on diet alone, 96% of women and 94% of men *did not meet* the Estimated Average Requirement (EAR) of 12mg/day.
- 49% of men and 66% of women used vitamin E supplements.
- Even with supplements, still 56% of women and 51% of men *did not meet* the EAR for α-topherol.

Study results provide an opportunity to review the presumed benefits of adequate vitamin E intake, and to educate the cohort on recommended daily allowances of vitamin E, its natural sources, and recommendations for supplementation

Dietary sources of α-tocopherol in the study included snack chips, oils, salad dressing, and fish preparations. Additional γ-tocopherol sources also included baked desserts, margarine, and corn preparations. Main dietary sources of α-tocopherol were not rich sources. The richest dietary sources are oils, sunflower seed kernels, and almonds.

- Vegetable oils, including olive, sunflower, safflower
- Nuts (almonds, hazelnuts, peanuts, sunflower seeds)
- Whole grains
- Green leafy vegetables

Scientists believe that it is difficult to consume the EAR of vitamin E from food alone without also increasing dietary fat intake above the recommended level; therefore, supplemental use is acceptable. Available in natural and synthetic forms, 100 IU of α-tocopherol is a sufficient and non-toxic amount. It is also important to know that the body is not able to use all of the vitamin. *Check the labels to determine the amount of α-tocopherol available in the preparation because γ-tocopherol and mixed tocopherol supplements are also available.*

- 100 IU natural α-tocopherol is equal to 67 units of usable tocopherol
- 100 IU synthetic α-tocopherol is equal to 45 units of usable tocopherol

Information taken from Jackson Heart Study article published in The Journal of Nutrition *2007: "Total α-Tocopherol Intakes Are Associated with Serum α-Tocopherol Concentrations in African American Adults" by Sameera A. Talegawkar, Elizabeth J. Johnson, Teresa Carithers, Herman A. Taylor Jr., Margaret L. Bogle, and Katherine L. Tucker.*

Whole Grain Foods Make Healthy Hearts

Clean out your pantry, update your recipes, rethink your restaurants and you'd better shop around because:

Live longer. Eating just 3 servings of *whole* grain food per day decreases your change of death by 23%, compared to eating ½ serving or less daily.*

Only 8 percent of Americans eat 3 servings of whole grain food daily.

Eating 3 servings of *whole* grain food per day decreases your change of coronary artery disease 28%, compared to eating ½ serving or less.*

Whole grains include wheat, oats, rice, corn, barley, rye and other grains.

Whole grains are in some bread, rice, cereal, pasta, crackers and pastries.

Use *whole* grain flour made from whole wheat, brown rice, oats, soy, rye, kamut, or spelt.

Whole wheat may be labeled "*100% whole wheat*" (not just "whole wheat").

Eat brown rice, wild rice, couscous and oatmeal. Slow-cooling types are best.

Check the ingredients list on food packaging. "Whole grain" or "whole" should be listed in front of various grain names as the first ingredient.

Supplements-such as oat bran, wheat germ and whole wheat flours- are widely available. Add them to soups, casseroles and salads.

Avoid "refined" or processed foods. Processing removes bran and germ from whole grains (including vitamins, minerals, and fiber).

Avoid white flour, white rice, white bread and food made with hydrogenated oils.

Avoid white flour pastas and "durum wheat" or "semolina" refined pastas.

"Natural" foods are not necessarily *whole* grain. Read the labels.

** These and other findings about whole grain foods are from the Atherosclerosis risk in Communities (ARIC) study. Additional research on specific whole grain, heart-healthy food now is being conducted in the Jackson Heart Study.*

Prevalence, Awareness, Treatment, and Control of Hypertension In the Jackson Heart Study

(Sharon B. Wyatt, Ermeg L. Akylbekova, Marion R. Wofford, Sean A. Coady, Evelyn R. Walker, Michael E. Andrew, Wanda J. Keahey, Herman A. Taylor, Daniel W. Jones)

High blood pressure or hypertension is more common in African Americans, control rates are lower than other ethnic groups in the US. Data from the Jackson Heart Study (JHS) was examined to determine the rates of hypertension, awareness of having high blood pressure, treatment with blood pressure medications, and control of blood pressure to recommended levels. Having hypertension (62.9%), being aware (87.3%), receiving treatment (83.2%), and achieving blood pressure control (66.4%) were high, especially among women and those who had other chronic health conditions (diabetes, chronic kidney disease, heart disease). Lower socioeconomic status was associated with having hypertension and achieving blood pressure control. Blood pressure control worsened with increasing age. Persons who smoked, particularly men, were less likely to be aware of their high blood pressure or to receive treatment. Not having health insurance was slightly associated with poorer blood pressure control while use of preventive care, especially for men, was positively associated with prevalence, awareness, and treatment. When compared with results from a large national study, control rates among JHS participants appeared to be higher than for African Americans in other parts of the United States and similar to that of whites. These results suggest that public health efforts to increase awareness and treatment among African Americans have been relatively effective. The JHS data indicate that better control rates can be achieved in this high-risk population.

Information taken from Hypertension 2008*; 51: 651–656*

You are cordially invited to the

Eighth Annual Jackson Heart Study Family Reunion

"Keeping Our Participants Informed"

At 10:00 A.M. on Saturday, September 27, 2008

At the Jackson Medical Mall Thad Cochran Center

350 W. Woodrow Wilson Drive,

Jackson, Mississippi 39209

Come and join your fellow participants for food, fun and fellowship.

Hear about some important JHS findings.

Article Submissions

JHS Heartbeat is published quarterly to enhance health awareness and understanding of cardiovascular disease among the community by presenting research findings, articles, book reviews on cardiovascular disease, diabetes, hypertension, strokes, cholesterol, physical activity and nutrition. Additionally, the newsletter facilitates communication among Jackson Heart Study staff, investigators, cohort members, contractors and the extended JHS family.

Articles are being selected for the following upcoming issues:

Submission Date	*Newsletter Publication*
March 15	Summer Edition
September 15	Winter Edition

Submissions should be about 800 words or less. Relevant pictures, illustrations and/or charts may be submitted with the articles. Information regarding forthcoming educational conferences and/or meetings is also requested. All material is subject to copyediting. Please include the author's full name and credentials, the agency's full name, street and web address and the author's contact information, including telephone, fax and e-mail. Information should be e-mailed or mailed to **Ms. Brenda Jenkins**, at:

By mail: JHS Newsletter, 350 W. Woodrow Wilson Drive, Suite 701, Jackson, MS 39213, or

By e-mail: brenda.w.campbell@jsums.edu

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