Assessing the Relationship between the Life's Simple 7 Metric with Diabetes and Breast Cancer Risk in African American Women

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Abstract

Diabetes and breast cancer mortality rates are significantly higher in African American (AA) women compared to non-Hispanic (NHW) white women and is a major US health disparity. Evidence suggest that Type 2 Diabetes Mellitus (T2DM) and breast cancer share multiple risk factors such as: age, obesity, diet, smoking, physical activity, and alcohol which contributes to the risk of developing diabetes and breast cancer. Furthermore, AA women have higher percentages of obesity than NHW women, which may be influenced by social determinants of health, such as, low socioeconomic status, medical access, and low education levels. Such factors are associated with limited healthy food selections and sedentary activity. This research is aimed to evaluate the relationship between the Life's Simple 7 (LS7) metric, individual health factors, physical activity, and diet component with diabetes and breast cancer risk in a sample of middle-aged African American women residing in the Southeastern US. Secondary data analysis of survey data collected through face-to face cognitive interview sessions were conducted with 30 AA women that resided in Charleston and Georgetown County, SC.
The interview sessions lasted approximately 1-1 ½ hours.
Participants were administrated four surveys. Questions were then identified from the surveys and used as surrogate data for the LS7 metric. Eighty-three percent of the sample reported having hypertension, fifty-three percent high cholesterol, thirty percent pre-diabetes, and thirty-three percent diabetes. Seventy-six percent of the participants were obese, and seventeen percent were overweight. In addition, twenty-three percent reported having low literacy skills, thirty percent reported having marginal literacy skills, and forty-seven percent reported having adequate literacy skills. These results suggest that the use of the Life's Simple 7 metric is an important tool that could modify lifestyle behaviors, which could reduce the risk of breast cancer and diabetes and that socioeconomic status, medical access, and low education levels plays a critical role in health disparities.

Introduction

Breast cancer is the most common disease in women, which is the second leading cause of cancer death among women (Maskarinec et al., 2017). Breast cancer account for 19% of cancer in AAs (DeSantis et al., 2016). As Maskarinec et al. (2017) note, AA women face a lower risk of being diagnosed with breast cancer as compared to NHW white women, but are more likely to die from breast cancer. The one main reason for the increase in incidence of breast cancer in the past decades is because of obesity (Wolf et al., 2005).

Like breast cancer, diabetes is another common and serious global health problem. According to CDC, diabetes is the seventh leading cause of mortality in the United States. The fact that T2DM diabetes prevalence rates are higher among AA women in comparison to NHW women has led to the hypothesis that modern lifestyle factors may have a greater effect on AA than on non-Hispanic whites (Larsson et al., 2007). The increasing risk of breast cancer between AA and NHW women is not due to modern lifestyle factors alone. AA women are also more likely to be impacted by social and economic health disparities.

LS7 is a new measure of CVH published by the American Heart Association (AHA) in 2010 to track health status in relation to a 2020 strategic goal to improve CVH of Americans (AHA, 2013). Life's Simple 7 is based on 4 modifiable health behaviors, including nonsmoking, healthy diet, physical activity, and body mass index (BMI), and 3 modifiable biological factors, including blood pressure (BP), total cholesterol, and fasting glucose (AHA, 2013).

Materials and Methods

Developing Questionnaires

National Health and Nutrition Examination Survey (NHANES) and Behavioral Risk Factor Surveillance System (BRFSS) were two sites that were accessed in order to get familiar with how to design questions that are related to health and nutritional status of the participants in this study.

Screening Questionnaire

Six short questions were asked to each participant in order to determine their eligibility for the study. The eligibility of the three participants consisted of middle-aged African American women 50-60 years old, who are overweight and have at least one of the following risk factors: diabetes, pre-diabetes, high blood pressure, high cholesterol, smokes, and are not pregnant.

Cognitive Interview Protocol

Face-to-face cognitive interview (CI) sessions were performed on 30 AA women. The location of these sessions were at private sites.

Survey instruments

The Rapid Estimate of Adult Literacy in medicine (REALM), International physical Activity, Eating at American's Table, Fat Intake Scale, and the Demographic Data survey was administered to each participant and the responses were recorded.

Demographic Data Interview

The Demographic interview consisted of general information needed to help interpret the results of the study. These questions consisted of: gender, race, education, employment, income, marital status, health insurance, general health, and diet.

Data Analysis

The study consisted of reviewing, documenting the individual interview, relying on handwritten notes, and subsequent review notes. Self-reported demographic data was coded and descriptive statistics completed to describe the total sample. Data was transcribed to coding sheets within excel.

Results

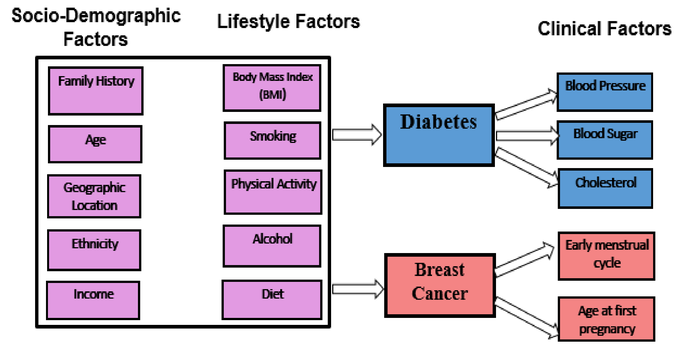
Life Simple 7 Goal/Metrics and Ideal Definitions

Goal/Metric	Ideal Cardiovascular Health Definition
Manage Blood Pressure	Blood pressure <120/<80 mmHg
Control Cholesterol	Total cholesterol <200 mg/dL
Reduce Blood Sugar	Fasting plasma glucose <100 mg/dL
Get Active	≥150 minutes/week moderate intensity or ≥75 minutes/week vigorous intensity or combination ≥60 minutes of moderate- or vigorous-intensity activity everyday
Eat Better	4-5 components or aspects of diet (practical approach with potential concrete actions)
Lose Weight	Body mass index <25kg/m^2
Stop Smoking	Never or quit > 12 months prior

Goal/Metric	Identified questions from the surveys	Responses n=30
Manage Blood Pressure	Have you ever been told by a health care provider that you have high blood pressure?	Yes= 83% No=17%
	How do you manage your high blood pressure?	Pill = 92% Diet/Other= 8%
Control Cholesterol	Have you ever been told by a health care provider that you have high cholesterol?	Yes=53% No=47%
	How do you manage your cholesterol?	Pill=81% Diet/Other=19%
Reduce Blood Sugar	Have you ever been told by a health care provider that you have pre-diabetes?	Yes=30% No =70%
	How do you manage your pre-diabetes?	Pill=89% Diet/other=11%
	Have you ever been told by a health care provider that you have diabetes?	Yes= 33% No= 67%
	How do you manage your diabetes "sugar"?	Pill = 80% Insulin Shots= 10% Diet/Other= 10%
Get Active	During the last 7 days, how many days did you do vigorous physical activities as part of your work?	Never = 79% 1-2 Days= 17% 3+ Days= 4%
	During the last 7 days, how many days did you do moderate physical activities as part of your work?	Never = 59% 1-2 Days=34% 3+ Days= 7%
Eat Better	Fat intake score ≤ 24	17%
	Fat intake score >24	83%
Lose Weight	Can you tell me your height, please?	Overweight (25 to < 30)=17%
	And your weight? (BMI)	Obese (30 or higher)= 76%
Stop Smoking	Are you a smoker?	No= 100%

Demographic Characteristics of Middle-Aged AA Women Residing in Southeastern US (n=30)	
Age, years, mean (range)	55.6 (50-60)
Education	
Some high school	23%
High school graduate	20%
Some college/technical school	30%
College graduate	27%
Marital Status	
Single	27%
Divorced/Separated	23%
Married	43%
Widowed	7%
Annual Household Income	
< US $20,000	24%
US $20,000 to $49,999	50%
≥ US $50,000	13%
Choose not to disclose	13%
Employment Status	
Employed wages	80%
Health Insurance	
Insured	87%
Uninsured	13%
Self-reported Health Status	
Poor/Fair	37%
Good	46%
Very good/Excellent	17%
Other self-reported medical problems	60%

Data are expressed as no. (%) unless otherwise indicated



Conceptual Model (Figure 1) display factors that contribute to increased risk of diabetes and breast cancer.

Conclusion

The results from the study suggest that the use of the Life's Simple 7 metric is an important tool that could be used to identify and advise on needed lifestyle behavior changes and goals, which could reduce the risk of breast cancer and diabetes. Social Determinants of Health (socioeconomic status, medical access, and education levels, etc) also play a critical role in health disparities.

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Acknowledgements

This work is partially supported by a National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) Grant # R34 DK097724, American Heart Association Strategically Focused Research Network Grant #15SFDRN25870000, and NIH/NCI **R25 CA193088**.

Research reported in this publication was fully or partially supported by the National Institute of General Medical Sciences of the National Institutes of Health under Award Number **R25GM113740**. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.