1.a. Full Title: Comparison of measurement performance of the Vital Exhaustion and Depression (MQ) scale across race and sex groups.

b. Abbreviated Title (Length 26 characters): MQ performance by race & sex

2. Writing Group (list individual with lead responsibility first):

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3. Timeline: Analysis and write-up should be completed in 12 months

4. Rationale:

   Mental health and/or psychological well being in different subgroups of the population is often assessed using standard survey instruments, such as scales. However, these instruments have often been created and originally tested on ethnically homogenous populations, or within one sex, and rarely been compared in measurement performance across different race / ethnic groups or in the opposite sex. Without investigation and documentation of such comparisons, these instruments may mask variations in symptomatology across ethnic and gender groups, leading to suboptimal diagnostic, preventive or therapeutic efforts. As the population of the US grows more elderly and more ethnically diverse, with larger proportions of women, this type of cross-group comparison of instruments becomes increasingly essential.

   The aim of this paper is to compare the psychometric properties of the 21 item “Vital Exhaustion and Depression” scale (also known as the Maastricht Questionnaire or MQ) among older African American vs. White men and women (that is, a comparison across 2 race and 2 sex groups). The MQ is a scale measuring psychological depression and exhaustion and is shown to be a significant precursor to myocardial infarction and heart disease. This scale, originally developed in the Netherlands, has been widely used in Europe. It is now being used in the US among large ethnically diverse samples of midlife and older adults (for e.g. the ARIC study with a baseline sample size of over 15,000 with substantial African American representation).

   Investigation and documentation of race and gender comparisons have been argued to be necessary for such measures. For e.g., regarding race, studies analyzing the performance of the CES-D (a widely used depressive symptomatology scale that, while self-reported by respondents, is correlated with diagnoses of clinical depression) indicate broadly comparable performance of this measure, albeit with a few differences, among a wide range of ethnic groups in the US and international settings (e.g. review in Mui, Burnette and Chen, 2002). Blazer et al (1998)
suggest few ethnic differences in prevalence of depressive symptoms. However, Mui et al (2002) and Okwumabua et al (1997) also argue that there has been little exploration of measurement issues, variations and correlates, which may mask underlying ethnic differences in symptomatology (Mui, Burnette and Chen, 2002; Okwumabua et al, 1997). Measurement issues are particularly important in self-reported measures. The measurement performance of standardized scales in total, and of specific items within those scales, which have typically been generated and normed on populations of Western European origin and cultures, must be compared across cultural and ethnic groups. Review findings suggest that variation in research objectives, samples, and analytic techniques make conclusive comparisons difficult. Further research and evidence on a variety of measures is called for.

Similarly, the MQ, whose association with cardiac disease in Western European populations has been well established, needs investigation of measurement performance in the light of its inclusion in US population based surveys, especially in a study such as the ARIC which has a multi-ethnic sample base, and sufficient sample size to permit comparison of issues across race and gender groups so that this measure can be used with confidence in its consistency and reliability among various groups.

Gender comparisons in such measures are also receiving increased attention, as recent research suggests that depressive symptomatology scales or other similar self-reported instruments may perform differently among women vs. men. For e.g., analyses of the CES-D scale suggest that women reveal higher scores and a different factor structure compared to men (Callahan and Wolinsky, 1994, McCallum 1995). The proposed paper therefore will add needed evidence on the performance of the MQ among male and female adults of African American and White race / ethnicity in the US. If differences are found, the proposed manuscript will discuss implications and potential modifications and appropriate uses of the MQ. If differences are not found, then the proposed ms will provide evidence on this point.

5. Main Hypothesis/Study Questions:
- Goal: to compare measurement adequacy of the Maastricht Questionnaire across different race / ethnic and sex groups
- Hypotheses:
  1. Psychometric indicators of measurement performance will be comparable across race (African American vs. White) groups.
  2. Measurement performance is likely to differ across sex (male vs. female) groups.

6. Data (variables, time window, source, inclusions/exclusions):
Study population: people who completed the Health and Life Profile form (that includes the Maastricht Questionnaire) at visit 2.
Variables (at visit 2)
- Items from the Maastricht Questionnaire.
- Demographic variables (sex, age, race).

Statistical Analysis:
Factor analysis will be used to compare the measurement adequacy and performance of the MQ across race and sex groups. In accordance with recent recommendations on measurement comparisons across ethnic groups among older populations, both exploratory and confirmatory factor analyses are necessary. Factor analysis is a statistical technique that is appropriate for analyzing the structure of the interrelationships (correlations) among a large number of variables (e.g., test scores, test items, questionnaire responses) by defining a set of common underlying dimensions, known as factors.

Methodologically, comparative studies (whether ethnic comparisons or cross-national comparisons) need to address the comparability of measure, on three dimensions. These are: conceptual equivalence (observed behaviors have the same meaning in different cultures); measurement equivalence (observed relationships have the same relationship with unmeasured constructs across different cultures) and structural equivalence (causal linkages between a given construct, its causes, and consequences, are invariant across cultures) (Liang, 2002).

Our paper will focus on measurement equivalence, as conceptual equivalence is usually investigated by means of in depth qualitative analyses that focus on constructing meanings, and structural equivalence is beyond our current scope (it is more appropriate for future efforts building on the currently proposed work). In order to examine measurement equivalence, we compare factor structure across race and sex groups. Procedures for analyzing factorial invariance across two or more groups include first, conducting explanatory factor analyses to identify the number of factors and the underlying pattern of factor loadings within groups, and contrasting them to see whether
they are the same. We examine similarity in model form to see whether the scale has the same number of factors in both groups, and whether similar items load on them; based on variance-covariance matrices. Additional exploratory techniques will include generating and comparing measures of internal consistency, such as Cronbach’s alpha.

However, exploratory factor analyses are by themselves insufficient to assess comparability of measurement across groups. Thus, the next step is to undertake simultaneous confirmatory factor analyses involving the comparison of common elements across groups. “This entails the examination of changes in goodness of fit by applying equivalence constraints involving factor loadings, measurement of error variances, residual error variances and covariances” (Liang, 2002: 15). For this study, the items from the Maastricht Questionnaire will be used.

References


7.a. Will the data be used for non-CVD analysis in this manuscript?  ____ Yes  ___X_ No

b. If Yes, is the author aware that the file ICTDER02 must be used to exclude persons with a value RES_OTH = “CVD Research” for non-DNA analysis, and for DNA analysis RES_DNA = “CVD Research” would be used?  ____ Yes  ____ No

(This file ICTDER02 has been distributed to ARIC PIs, and contains the responses to consent updates related to stored sample use for research.)

8.a. Will the DNA data be used in this manuscript?  ____ Yes  _X___ No

8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must be used, or the file ICTDER02 must be used to exclude those with value RES_DNA = “No use/storage DNA”?  ____ Yes  ____ No

9. The lead author of this manuscript proposal has reviewed the list of existing ARIC Study manuscript proposals and has found no overlap between this proposal and previously approved manuscript proposals either published or still in active status. ARIC Investigators have access to the publications lists under the Study Members Area of the web site at:
http://www.csec.unc.edu/ARIC/search.php  

  ____X__  Yes     _______ No

10. What are the most related manuscript proposals in ARIC (authors are encouraged to
contact lead authors of these proposals for comments on the new proposal or collaboration)?
The most related proposals in ARIC are those led by Dr. Dhossche, analyzing the MQ as a measure of depression. Dr. Dhossche has been contacted and is collaborating on the currently proposed ms. He has also been in correspondence with other potentially interested authors and those who are interested in this topic have been included in the writing group.

11. Manuscript preparation is expected to be completed in one to three years. If a manuscript is not submitted for ARIC review at the end of the 3-years from the date of the approval, the manuscript proposal will expire.