

Running head: COMPARING FATIGUE

COMPARING FATIGUE IN ADULTS WITHOUT MYOCARDIAL INFARCTION TO
THOSE POST MYOCARDIAL INFARCTION

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Abstract

Fatigue is a common symptom experienced after a myocardial infarction (MI) with up to 70% of persons reporting fatigue that is different than fatigue prior to their MI. More importantly, fatigue has been associated with poor clinical outcomes. What is not understood is how fatigue after an MI differs from fatigue in those adults without heart disease. This cross sectional descriptive study addressed the following research questions: (1) What is the average fatigue scores of adults without heart disease residing in the community?; and (2) Is there a difference in fatigue in a community sample of adults without heart disease compared to an age matched sample who has experienced an MI in the last 3 to 7 years?

A convenience sample of community dwelling adults ($n = 40$), ages 21 and older, who had no experienced an MI or heart surgery completed a demographic health form, and the Revised Piper Fatigue Scale (range 0-220). All data were obtained via interview and recorded on paper forms. Age matched controls were randomly selected from an established data base of adults who were 3 to 7 years post MI and who completed the Recurrence of Myocardial Infarction (ROMI) study. Data were entered into SPSS and analyzed using descriptive statistics and t -tests.

Community participant ($n = 40$) ages ranged from 21-83 with a mean age of 58.75. Most were women (60%) and White (70%). There was a significant difference between fatigue scores in the community sample ($M = 42.8$; $SD = 48.5$) and the ROMI sample ($M = 99.6$, $SD = 50$): $t = 4.51(61)$; $p < .001$. Understanding how fatigue, the number one complaint in primary care, differs after MI compared to community-based

samples is important in designing strategies to minimize fatigue and increase participation in physical activity levels to prevent heart disease.

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Comparing Fatigue in Adults Without Myocardial Infarction to Those Post Myocardial Infarction

Coronary heart disease refers to the buildup of plaque in the blood vessels that results in complications involving the cardiac system such as angina, stroke and myocardial infarction (“Heart disease”, 2018). Heart disease includes myocardial infarction, heart failure, and valve disease. More importantly, heart disease can be prevented by good lifestyle choices such as increased physical activity(PA), proper nutrition, and a reduction in stress levels.

Literature Review

From the years 2009 to 2013, heart disease was the number one cause of death in the nation and in Pitt County. There are disparate outcomes in death rates with non-Hispanic African American males having the highest death rate. The Pitt County population that experienced the highest rate of death due to heart disease was Hispanic African American males, followed by non-Hispanic White males. After males, non-Hispanic females had higher death rates compared to their White female counterparts (“Community health needs assessment,” 2015).

By the time one has properly brushed their teeth, three people in the United States will have experienced a myocardial infarction (MI). According to the American Heart Association, one person in the United States has an MI every 40 seconds. An MI occurs when the arteries cannot properly oxygenate the heart muscle due to poor blood flow from atherosclerosis or a clot in the coronary arteries resulting in myocardial tissue death (American Heart Association, n.d.).

One common symptom experienced after an MI is fatigue that is different than fatigue prior to an MI and that persists (Crane, Abel, McCoy, 2014). This fatigue affects the ability to participate in PA as well as the quality of life (Alsén et. al, 2009). The exact biological process of fatigue is unknown. However, we do know that persons experience both acute and chronic fatigue. Acute fatigue may result from factors such as not getting enough sleep or ineffective sleep, over exertion, and high stress levels. Chronic fatigue affects one's life on a daily basis and is a subjective symptom. Fatigue is common post MI, especially in the recovery phase (Fredriksson-Larsson et. al, 2015). Little research has been done on perceived fatigue in those who have not experienced an MI versus perceived fatigue in those who have experienced an MI.

To better understand fatigue and CHD, a literature review was conducted using a Boolean search. The following terms were used: fatigue, myocardial infarction, PA, and vital exhaustion. Only research articles were reviewed (N=22) that were published from 2005 to 2017. All articles were examined for measures of fatigue, inclusion of men and women, age and race of participants, and study outcomes. This review synthesizes the findings.

Most of the studies ($n = 14$; 64%) reviewed examined fatigue as an outcome. Fatigue was associated with depression in seven studies (Alsén & Brink, 2013; Brink, & Grankvist, 2006; Johansson, Karlson, Grankvist, & Brink, 2010; Crane, 2005; Crane, Efird, & Abel, 2016; Couper et al., 2010; Fredriksson-Larsson, Alsén, Karlson, & Brink, 2015), sleep in three studies (Johansson, Karlson, Grankvist, & Brink, 2010; Crane, 2005; Fredriksson-Larsson, Alsén, Karlson, & Brink, 2015), and sex in two studies (Alsén &

Brink, 2013; Williams et al., 2010). When examining all three predictor variables, depression was consistently the strongest predictor of fatigue.

Sex and Race Differences

Two of the studies reviewed (9%) reported a significant correlation between sex and fatigue post MI (Alsén & Brink, 2013; Couper et al., 2010). In the study by Alsén and Brink, women were found to have a higher fatigue scores than men on the Multidimensional Fatigue Inventory (MFI-20). Fatigue was found to be highest at four months post MI, but almost half of the participants were still experiencing fatigue at 2 years post MI (Alsén & Brink, 2013). Couper et al. (2010) found from their large study (N = 12,895) that vital exhaustion scores, measured using the 21-item Maastricht Questionnaire, were significantly higher in women than men ($p < 0.0001$) and significantly higher in Blacks than Whites ($p < 0.0001$). This strongly suggests a correlation between vital exhaustion, which has a subset of fatigue, could be influenced by both sex and race.

Conversely, in the study by Crane, Efirid and Abel (2016), fatigue persisted 6-8 months post MI in 76% of men and women (N = 98) with no significant relation found between sex and fatigue ($p = 0.85$). Black participants in this study accounted for 18% of the total participants who experienced fatigue, and 12% of participants did not experience fatigue post MI (2016). It is important to include both Blacks and Whites, and men and women in future studies to further examine if sex or race are important when measuring fatigue post MI. Results would assist us tailoring interventions for fatigue post MI by sex and/or race.

Depression

In 2013 Alsén and Brink conducted research to determine: (a) how fatigue and depression change from four months to two years post MI, (b) if gender has an influence on these changes, and (c) if fatigue occurs without depression. Results indicated that only 18% of total participants (N = 155) experienced fatigue with coexisting depression, 30% reported fatigue without coexisting depression, and 51% of participants did not experience fatigue or depression (Alsén & Brink, 2013). Another study (Brink and Grankvist, 2006) noted a weak association between fatigue and depression, suggesting that fatigue may be experienced without coexisting depression. However, a study by Crane, Efrid, and Abel (2016) found when controlling for body mass index (BMI), age, and IL-6, significant associations with fatigue scores and depression scores (P trend = 0.0004).

The literature is inconsistent on the coexistence of fatigue and depression post MI. It is important that more research is done to further investigate the association between fatigue and depression post MI and the relevance to a recurrent MI. Early nursing interventions to prevent depression and fatigue after an MI could potentially enhance better behaviors to prevent a recurrent MI.

Sleep

Disturbed sleep can lead to general feelings of fatigue. Disturbed sleep was found to be associated with fatigue in those with CVD in three out of the 22 articles reviewed (Crane, 2005; Fredriksson-Larsson, Alsén, Karlson, & Brink, 2015; Johansson, Karlson, Grankvist, & Brink, 2010). Using the Epworth Sleepiness Scale, Crane found a

moderately strong correlation between sleep and fatigue in older women 6 to 12 months post MI (2005). According to a multivariate analysis, depression ($p < 0.001$) and sleep ($p = 0.027$) were significantly important, accounting for 32.7% of the variance in fatigue (Crane, 2005). Another study found an association between women and disturbed sleep using the Karolinska Sleep Questionnaire. Women reported more disturbed sleep than men ($p < 0.05$), and 55% of all participants ($N = 204$) reported having sleep disturbances, sometimes or always (Brink, Grankvist, Johansson, & Karlson, 2010). In a study by Fredriksson-Larsson, Alsén, Karlson, and Brink, sleep quality was measured using the Pittsburgh Sleep Quality Index. Depression and sleep quality were significant individual variables associated with fatigue at $p = 0.002$ and $p < 0.001$ respectively (2015). However, in the final regression analysis, sleep was no longer considered statistically significant (Fredriksson-Larsson, Alsén, Karlson, & Brink, 2015). Not using the same sleep scale across studies makes comparisons across studies difficult. Despite the various measures, it is clear that sleep is correlated with fatigue after an MI. Further studies are needed to understand if the quality, amount, or efficiency of sleep most influences fatigue. Further, is the correlation of sleep to fatigue post MI similar to a community sample of adults. Examining sleep and fatigue in a community sample to compare with those post MI would provide important information for understanding sleep and fatigue in CHD populations

Physical Activity

Physical activity (PA) is one of the most effective forms of secondary prevention of reoccurring MI's (Brändström et. al, 2009; Minges et. al, 2017). Fatigue leads to restrictions in daily and PA, as well as to a lack of motivation and feelings of

demoralization (Alsén, Brink, & Persson, 2008). According to Crane, Abel and McCoy, fatigue has been found to be a significant influence on the amount and intensity of PA older adults engage in post MI (2015). A cross-sectional descriptive correlational study was performed to examine if fatigue and certain blood components --hemoglobin, IL-6, and B-natriuretic peptide (BNP) --have an impact on PA levels in people 65 years and older who had experienced an MI within 6-8 months. Results from this study found that a negative correlation was present between 3 of the subscale scores of the Revised Piper Fatigue Scale (RPFS), PA frequency, and PA intensity. However, this was not true for the cognitive/mood subscale of the RPFS. There was no difference between men and women and reports of frequency of PA, however men reported higher energy expenditure of PA than women ($p = .011$). Controlling for biophysiological measures, sex, and age, the RPFS significantly explained 16% of the variance in the frequency of PA ($p = .03$), with no individual subscale serving as a significant predictor. “The RPFS behavior/severity subscale explained 31% of the variance in energy expended on all PA ($p < .001$) and 40% of the variance in energy expended on moderate-intensity PA ($p < .001$)” (Crane, Abel, & McCoy, para.1, 2015). This study found that fatigue significantly influenced PA.

In comparison, a study was done to determine if those 65 years and younger who had an MI in the last 6 months are getting enough PA every day via walking. One fourth of those participating in the study reported fatigue that occurred sometimes to most of the time. The majority of the participants answers to the self-report question about weekly engagement in PA correlated strongly with the results of the daily steps, $r = 0.54(p < 0.01)$, 95% CI: 0.38 - 0.68. Less than 40% of the participants exercised for 30 minutes or more, and the average steps from the pedometer was 6719/ day ($SD = 3771$). Obtaining

fewer daily steps was found to be associated with older age and a higher fatigue subset score on the Somatic Health Complaints Questionnaire (Brändström et. al, 2009). Current recommendation by professionals is to aim for at least 30 minutes of PA a day (Brändström et. al, 2009). These finding indicate that not enough PA via walking is occurring post MI and noted the importance of fatigue in PA participation.

Remaining active post MI is an important primary and secondary preventative measure of CHD (“Heart disease”, 2018). Health care providers should assess for feelings of fatigue, especially in those with heart disease. Because fatigue significantly influences typical daily activity levels, fatigue should be monitored, and health providers should encourage frequent PA at a moderate intensity level (Crane, Abel, & McCoy, 2015) for cardiovascular benefit.

Purpose of the Study

Fatigue is common post MI, especially in the recovery phase (Fredriksson-Larsson et. al, 2015) and persists 3 to 24 months post MI (Alsén & Brink, 2013; Crane, Efirid & Abel, 2016). More importantly, fatigue is related to adverse cardiac outcomes, such as cardiac readmission and sudden cardiac death, (Alsén, Brink, & Persson, 2008; Konkoly et al., 2017). Understanding fatigue is important to identify those at risk and to design interventions to decrease or mitigate fatigue and improve health outcomes and quality of life. Little is known about perceived fatigue in those who have not experienced an MI versus perceived fatigue in those who have experienced an MI. This research study examined fatigue in adults 21 and older who have never had an MI compared to fatigue in those who have experienced one or more MI(s) and are 3 to 7 years post MI.

Research Question

This cross sectional descriptive study addressed the following research questions: (1) What is the average fatigue scores of adults without heart disease residing in the community?; and (2) Is there a difference in fatigue in a community sample of adults without heart disease compared to an age matched sample who has experienced an MI in the last 3 to 7 years?

Methodology

A cross sectional design was used to answer the research question. This study was approved by the appropriate IRB by East Carolina University Institutional Review Board. Data were collected on fatigue using the Piper Fatigue Scale on a convenience sample of community dwelling adults ($n = 40$), ages 21 and older, who have not had an MI or heart surgery. All completed a demographic health form (see Appendix A) and the Revised Piper Fatigue Scale (range 0-220). All data were obtained via interview and recorded on paper forms. Age matched controls were randomly selected from an established data base of adults who were 3 to 7 years post MI and who completed the Recurrence of Myocardial Infarction(ROMI) study. Data were entered into SPSS and analyzed using descriptive statistics and t -tests.

The Piper Fatigue Scale consists of the following 22 questions: (a) To what degree is the fatigue you are feeling now causing you distress? (No Distress to A Great Deal); (b) To what degree is the fatigue you are feeling now interfering with your ability to complete your work or school activities? (None to a great deal); (c) To what degree is the fatigue you are feeling now interfering with your ability to socialize with your friends? (None to A Great Deal); (d) To what degree is the fatigue you are feeling now

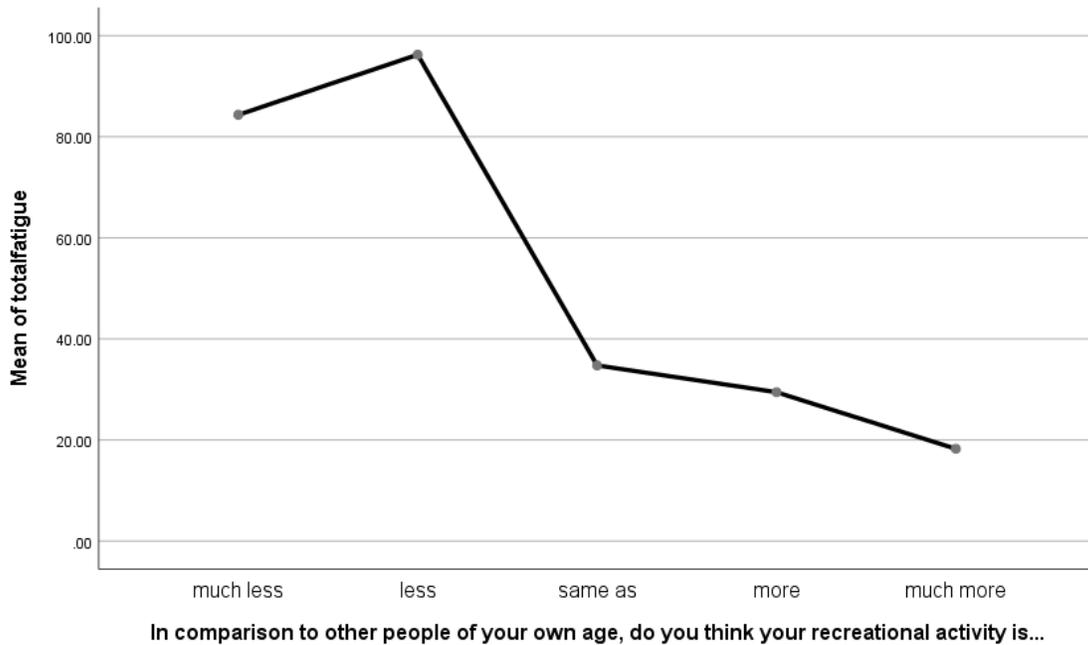
interfering with your ability to engage in sexual activity? (None to A Great Deal); (e) Overall, how much is the fatigue which you are now experiencing interfering with your ability to engage in the kind of activities you enjoy doing? (None to A Great Deal); (f) How would you describe the degree of intensity or severity of the fatigue which you are experiencing now? (Mild to Severe); (g) To what degree would you describe the fatigue which you are experiencing now as being? (Pleasant to Unpleasant); (h) To what degree would you describe the fatigue which you are experiencing now as being? (Agreeable to Disagreeable); (i) To what degree would you describe the fatigue which you are experiencing now as being? (Protective to Destructive); (j) To what degree would you describe the fatigue which you are experiencing now as being? (Positive to Negative); (k) To what degree would you describe the fatigue which you are experiencing now as being? (Normal to Abnormal); (l) To what degree are you now feeling? (Strong to Weak); (m) To what degree are you now feeling? (Awake to Sleepy); (n) To what degree are you now feeling? (Lively to Listless); (o) To what degree are you now feeling? (Refreshed to Tired); (p) To what degree are you now feeling? (Energetic to Unenergetic); (q) To what degree are you now feeling? (Patient to Impatient); (r) To what degree are you now feeling? (Relaxed to A Great Deal); (s) To what degree are you now feeling? (Exhilarated to Depressed); (t) To what degree are you now feeling? (Able to Concentrate to Unable to Concentrate); (u) To what degree are you now feeling? (Able to Remember to Unable to Remember); (v) To what degree are you now feeling? (Able to Think Clearly to Unable to Think Clearly) (*Appendix 2: Piper fatigue scale*, 2014). Each of the 22 items are scored on a 0 to 10 scale with a possible range of 0 to 220 (see Appendix B). This tool has strong reliability and validity (Crane, Abel, McCoy, 2014).

The Cronbach’s alpha score for this study was .959.

Results

Community participant’s ($n = 40$) ages ranged from 21-83 with a mean age of 58.75 ($SD = 14.2$). Half were women ($n = 20$) and 65.4% were White ($n = 26$). A significant difference was found between education level between the community sample with the community sample having more who reported greater than a high school education $X^2 = 16.82 (1), p < .001$. There was a significant difference between fatigue scores in the community sample ($M = 39.6; SD = 48.0$) and the ROMI sample ($M = 64.8, SD = 62.7$): $t = 2.02 (78); p = .047$. We explored fatigue and perception of recreational activity compared to others and noted a significant difference $F = 7.39 (4, 75); p < .001$.

Figure 1.



Discussion

Fatigue is a symptom that should be well monitored and controlled prior to development of heart disease. Measuring fatigue in the clinical setting is important when assessing healthy behaviors to improve cardiovascular outcomes. In this study, fatigue in the community sample was found to be significantly less than fatigue in the ROMI sample.

The education levels of the community sample were much higher than the ROMI sample. The average education level fell between “some college” and “baccalaureate degree”, whereas in the ROMI sample the average education level fell between “some technical school” and “technical school”. These results are similar to a study by Junghaenel, Christodoulou, Lai, and Stone (2011) that noted an association between higher education levels and lower fatigue.

Fatigue scores were associated with participation in recreational activities. The higher perceived recreational activity was associated with lower mean fatigue scores. This is consistent with findings noting the influence of fatigue on PA (Crane, Abel, McCoy, 2014). Understanding how fatigue differs after MI compared to community-based samples is important in designing strategies to minimize fatigue and increase participation in PA levels to prevent heart disease.

This sample represented both men and women equally and provided ample representation between both White and Black older adults in the Eastern North Carolina area. Future research should include a larger sample size with a wider variation in education levels, and measure fatigue on multiple occasions over time to track changes in fatigue scores and lifestyles.

Limitations

One limitation to this study is the small sample size and the higher education level of the community sample. A larger sample size with a wider variation in education level might yield different results that would better represent the general community in Eastern North Carolina.

Conclusion

As the leading cause of death in the county, nurses are ensured to engage with persons who have heart disease no matter the nurse's specialty. Nurses are the ones who get to know the persons the best, thus they should be able to identify those who are experiencing fatigue, the number one complaint in primary care, and determine the cause. If a link between fatigue, MIs, and reoccurring MIs can be identified, nurses can educate their patients on ways to lower fatigue to foster increased PA at levels for cardiovascular benefit and improve their health.

References

- Alsén, P., Brändström, Y., Brink, E., Grankvist, G., Herlitz, J., & Karlson, B. W. (2009). Physical activity six months after a myocardial infarction. *International Journal of Nursing Practice, 15*(3), 191. doi: 10.1111/j.1440-172X.2009.01744.x
- Alsén, P., & Brink, E. (2013). Fatigue after myocardial infarction – a two-year follow-up study. *Journal of Clinical Nursing, 22*(11-12), 1647-1652. 10.1111/jocn.12114
Retrieved from <https://onlinelibrary-wiley-com.jproxy.lib.ecu.edu/doi/abs/10.1111/jocn.12114>
- Alsén, P., Brink, E., & Persson, L. (2008). Living with incomprehensible fatigue after recent myocardial infarction. *Journal of Advanced Nursing, 64*(5), 459. Retrieved from <https://gup.ub.gu.se/publication/94880>
- Alsén, P., & Eriksson, M. (2016). Illness perceptions of fatigue and the association with sense of coherence and stress in patients one year after myocardial infarction. *Journal of Clinical Nursing, 25*(3-4), 525. Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:hv:diva-8300>
- American Heart Association*. About heart disease. (n.d.). Retrieved February 25, 2018, from http://www.heart.org/HEARTORG/Conditions/HeartAttack/AboutHeartAttacks/About-Heart-Attacks_UCM_002038_Article.jsp#.WpL402a-KYU
- Appendix 2: Piper fatigue scale* (2014). Retrieved from <http://geriatrictoolkit.missouri.edu/fatigue/PiperFatigueScale.pdf>

Brändström, Y., Brink, E., Grankvist, G., Alsén, P., Herlitz, J., & Karlson, B. W. (2009).

Physical activity six months after a myocardial infarction. *International Journal of Nursing Practice*, 15(3), 191. Retrieved

from <http://urn.kb.se/resolve?urn=urn:nbn:se:hv:diva-1745>

Brink, E., & Grankvist, G. (2006). Associations between depression, fatigue, and life

orientation in myocardial infarction patients. *The Journal of Cardiovascular*

Nursing, 21(5), 407. Retrieved from <http://www.ncbi.nlm.nih->

[gov.jproxy.lib.ecu.edu/pubmed/16966918](http://www.ncbi.nlm.nih.gov.jproxy.lib.ecu.edu/pubmed/16966918)

Community health needs assessment (2015). Retrieved from

<https://www.pittcountync.gov/ArchiveCenter/ViewFile/Item/140>

Crane, P. B. (2005). Fatigue and physical activity in older women after myocardial

infarction. *Heart & Lung - the Journal of Acute and Critical Care*, 34(1), 30-38.

10.1016/j.hrtlng.2004.08.007 Retrieved from <https://www.sciencedirect->

[com.jproxy.lib.ecu.edu/science/article/pii/S0147956304001712](https://www.sciencedirect.com.jproxy.lib.ecu.edu/science/article/pii/S0147956304001712)

Crane, P. B., Abel, W. M., & McCoy, T. P. (2015). Fatigue and physical activity after

myocardial infarction. *Biological Research for Nursing*, 17(3), 276-284.

10.1177/1099800414541961 Retrieved

from <http://journals.sagepub.com.jproxy.lib.ecu.edu/doi/full/10.1177/109980041454>

[1961](http://journals.sagepub.com.jproxy.lib.ecu.edu/doi/full/10.1177/1099800414541961)

Crane, P. B., Efird, J. T., & Abel, W. M. (2016). Fatigue in older adults postmyocardial

infarction. *Frontiers in Public Health*, 4, 55. Retrieved from <http://www.ncbi.nlm->

[nih.gov.jproxy.lib.ecu.edu/pubmed/27148509](http://www.ncbi.nlm-nih.gov.jproxy.lib.ecu.edu/pubmed/27148509)

- Fredriksson-Larsson, U., Brink, E., Alsén, P., Falk, K., & Lundgren-Nilsson, Å. (2015). Psychometric analysis of the multidimensional fatigue inventory in a sample of persons treated for myocardial infarction. *Journal of Nursing Measurement, 23*(1), 154-167. doi:10.1891/1061-3749.23.1.154
- Johansson, I., Karlson, B. W., Grankvist, G., & Brink, E. (2010). Disturbed sleep, fatigue, anxiety and depression in myocardial infarction patients. *European Journal of Cardiovascular Nursing, 9*(3), 175-180. 10.1016/j.ejcnurse.2009.12.003 Retrieved from <http://journals.sagepub.com.jproxy.lib.ecu.edu/doi/full/10.1016/j.ejcnurse.2009.12.003>
- Junghaenel, D., Christodoulou, C., Lai, J.S., & Stone, A. (2011). Demographic correlates of fatigue in the US general population: Results from the patient-reported outcomes measurement information system (PROMIS) initiative. *Journal of Psychosomatic Research, 71*(3), 117-123. doi:10.1016/j.jpsychores.2011.04.007
- Mayo clinic. Heart disease. (2018, February 23). Retrieved February 25, 2018, from <https://www.mayoclinic.org/diseases-conditions/heart-disease/symptoms-causes/syc-20353118>
- Minges, K. E., Strait, K. M., Owen, N., Dunstan, D. W., Camhi, S. M., Lichtman, J., . . . Krumholz, H. M. (2017). Gender differences in physical activity following acute myocardial infarction in adults: A prospective, observational study. *European Journal of Preventive Cardiology, 24*(2), 192-203. 10.1177/2047487316679905 Retrieved from <http://journals.sagepub.com.jproxy.lib.ecu.edu/doi/full/10.1177/2047487316679905>

Appendix A

Demographic Health Form

ID:
_____Date:
____/____/____

Community Sample:

Reoccurrence of MI Survey Please place an X in the box for each response

Demographics

1. Are you a: ¹ Woman ² Man

2. What was your age on last birthday? _____

3. What is your ethnicity/race?
 - ¹ African-American/Black
 - ² Caucasian/White
 - ³ Multi-racial (Ask "Which do you consider most?") _____
 - ⁴ Other _____

4. How would you describe your current marital status?
 - ¹ Single and never married
 - ² Living with partner
 - ³ Married
 - ⁴ Divorced or separated
 - ⁵ Widowed

5. What is the highest level of schooling completed?
 - ¹ 8 years or less

- ² 9-11 years
- ³ High school graduate (or GED)
- ⁴ Some technical school
- ⁵ Technical school
- ⁶ Some college
- ⁷ Baccalaureate degree
- ⁸ Some graduate
- ⁹ Graduate degree or higher

6. What is your occupation?

- ¹ Housewife
- ² Work or volunteer outside the home _____
- ³ Other _____
- ⁴ Retired-- If yes, what position before retired? _____

7. Is your work or volunteering outside the home?

- ¹ Part time
- ² Full time
- ³ Not Applicable, **Skip to question #10**

8. After work or volunteering, are you physically tired?

- ¹ Never
- ² Seldom
- ³ Sometimes
- ⁴ Often
- ⁵ Always

12. In comparison with other people (women or men) of your own age, do you think your recreational physical activity is ...

- ¹ Much less

- ² Less
- ³ Same as
- ⁴ More
- ⁵ Much more

For the following questions, think about activities such as **walking briskly, jogging, taking aerobics classes, working out on a cross-trainer or elliptical machine, biking, playing tennis, dancing, swimming, and other such types of physical activity.**

13. During the **past month**, did you participate in any of the above activities or in any similar activities **not** included in the list?

- ¹ Yes
- ² No, **Skip to question # 15**

14. Which sport or exercise did you do **most frequently in the past month**?

_____ *Specify only on activity*

a. How many **hours a week** did you usually do this activity?

- ¹ Less than 1 hour per week
- ² At least 1 hour, but less than 2 hours per week
- ³ At least 2 hours, but less than 3 hours per week
- ⁴ At least 3 hours, but less than 4 hours per week
- ⁵ At least 4 hours per week

b. Did you do any other exercise or play any other sport in the **past month**?

- ¹ Yes
- ² No, **Skip to question #15**

c. What was the second most frequent sport or exercise you did in the past month?

_____ *specify only one activity*

d. How many **hours a week** did you usually do this activity?

- ¹ Less than 1 hour per week

- ² At least 1 hour, but less than 2 hours per week
- ³ At least 2 hours, but less than 3 hours per week
- ⁴ At least 3 hours, but less than 4 hours per week
- ⁵ At least 4 hours per week

e. Did you do any other exercise or play any other sport in the **past month**?

- ¹ Yes
- ² No, **Skip to question # 15**

f. What was the third most frequent sport or exercise you did in the past month?
_____ *Specify only on activity*

g. How many **hours a week** did you usually do this activity?

- ¹ Less than 1 hour per week
- ² At least 1 hour, but less than 2 hours per week
- ³ At least 2 hours, but less than 3 hours per week
- ⁴ At least 3 hours, but less than 4 hours per week
- ⁵ At least 4 hours per week

20. We are interested if people in this study have enough money to buy medication and take care of themselves.

For that reason, I would like to know **your** approximate average *combined* yearly household income?

- ¹ Less than \$10,000
- ² \$10,000 - \$19,999
- ³ \$20,000 - \$29,999
- ⁴ \$30,000 - \$39,999
- ⁵ \$40,000 - \$49,999
- ⁶ \$50,000 - \$59,999
- ⁷ \$60,000 - \$69,999

- ⁸ \$70,000 - \$79,999
- ⁹ \$80,000 - \$89,999
- ¹⁰ \$90,000 - \$99,999
- ¹¹ Over \$100,000
- ¹² Don't know
- ¹³ Refused

21. What best describes your health insurance status? *(Select all that apply)*

- ¹ Private/Employer Based
- ² Medicare/Medicaid
- ³ Medicare Plus
- ⁴ Military/Veteran
- ⁵ None

Health Status

22. In general, how would you describe your current health?

- ¹ Excellent
- ² Very Good
- ³ Good
- ⁴ Fair
- ⁵ Poor

23. In the past 12 months, how often have you been to:	Number of times
a. Emergency Department	
b. Hospitalized for more than 24 hours	
c. Doctor visits	

26. Has your doctor or health care provider told you that you have an abnormal heartbeat?

¹ Yes

² No

27. Has your doctor or health care provider ever told you that you have high blood pressure?

¹ Yes

² No

28. Has your doctor or health care provider ever told you that you have high blood cholesterol?

¹ Yes

² No

29. Does or did your mother, father, aunts, uncles, or other family have a history of - - **X** the box if the answer is yes:

	Heart Attack	Stroke	High Blood Pressure	Diabetes
a. Mother	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴
b. Father	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴
c. Aunt/Uncle	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴
d. Grandparent	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴
e. Other:	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

30. Have you ever smoked more than 5 packs of cigarettes in your life, chewed tobacco or dipped snuff?

¹ Yes

² No, **Skip to question #34**

31. How many years did you smoke, dip or chew? _____ Years

32. Do you currently smoke (dip or chew)?

¹ Yes

² No, **Skip to question #34**

33. How many cigarettes do you presently smoke per day? ____/day

34. Do you or did you live around people who smoke (d) every day?

¹ Yes

² No

35. How much alcohol do you drink?

¹ None

² 1 – 3 drinks/month

³ 1 – 3 drinks/week

⁴ 4 – 6 drinks/week

⁵ 7 – 10 drinks/week

⁶ > 11 drinks/week

36. Do you have diabetes or need medication to control your blood sugar?

¹ Yes

² No

37. Which of the following types of medications do you take at least daily:	NO	YES	List Drug and Dosage on your prescription bottle
a. Antihypertensive to lower blood pressure	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
b. Insulin or oral hypoglycemic to lower blood sugar	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
c. Cholesterol lowering drug	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	

d. Drug to treat angina/chest pain	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
e. Arthritis	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
f. Sinus or allergy medication	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
g. Water pill	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
h. Thyroid medication	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
i. Vitamins	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
j. Stomach pills	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
k. Aspirin	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
l. Pill for nerves	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
m. Hormones	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	
n. Other medication Specify: Ask "any herbal products?"	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	

48. Chronic Condition ... X box if yes	Healthcare Provider Told you	Taking medication for condition	Name of medication	Medication Side effect = Fatigue
a. Heart disease	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
b. Respiratory illness	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
c. Asthma or Rheumatism	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
d. Rheumatoid arthritis	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
e. Cancer	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
f. Parkinson's	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
g. Hypertension	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
h. Diabetes	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
i. Epilepsy	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
j. Asthma/Rhinitis/Allergies	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
k. Acne	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
l. Ulcers	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
m. Glaucoma	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
n. Gout/Hyperuricemia	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
o. High cholesterol	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
p. Migraines	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
q. Tuberculosis	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
r. Peripheral vascular disease	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
s. Cerebrovascular disease (stroke or TIA)	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
t. Liver disease	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
u. Hemiplegia/Paralysis	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴

v. Renal disease	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴
w. Obesity	<input type="checkbox"/> ¹ Yes	<input type="checkbox"/> ² No		
	<input type="checkbox"/> ¹	<input type="checkbox"/> ²		<input type="checkbox"/> ⁴

Appendix B

Revised Piper Fatigue Scale

ID: _____

For each of the following questions, circle the number that best describes the fatigue you are experiencing now. Please make every effort to answer each question to the best of your ability.

Have you experienced fatigue tiredness, exhaustion, or lack of energy?

- A. A lot
- B. Some
- C. Just a little
- D. None at all

If you answered “None at all,” you do not need to complete this questionnaire)

1. How long have you been feeling fatigued?

- a. Minutes _____
- b. Hours _____
- c. Days _____
- d. Weeks _____
- e. Months _____
- f. Other (please describe)

2. To what degree is the fatigue you are feeling now causing you distress?

No distress A great deal of distress
 0 1 2 3 4 5 6 7 8 9 10

3. To what degree is the fatigue you are feeling now interfering with your ability to complete your work or other activities?

None A great deal
 0 1 2 3 4 5 6 7 8 9 10

4. To what degree is the fatigue you are feeling now interfering with your ability to visit or socialize with your friends?

None A great deal
 0 1 2 3 4 5 6 7 8 9 10

5. To what degree is the fatigue you are feeling now interfering with your ability to engage in sexual activity?

None 0 1 2 3 4 5 6 7 A great deal 8 9 10

6. Overall, how much is the fatigue, which you are experiencing now, interfering with your ability to engage in the kind of activities you enjoy doing?

None 0 1 2 3 4 5 6 7 A great deal 8 9 10

7. How would you describe the degree of intensity or severity of the fatigue which you are experiencing now?

Mild 0 1 2 3 4 5 6 7 Severe 8 9 10

To what degree would you describe the fatigue which you are experiencing now as being:

8. Pleasant 0 1 2 3 4 5 6 7 Unpleasant 8 9 10

9. Agreeable 0 1 2 3 4 5 6 7 Disagreeable 8 9 10

10. Protective 0 1 2 3 4 5 6 7 Destructive 8 9 10

11. Positive 0 1 2 3 4 5 6 7 Negative 8 9 10

12. Normal 0 1 2 3 4 5 6 7 Abnormal 8 9 10

13. To what degree are you now feeling:

Strong 0 1 2 3 4 5 6 7 Weak 8 9 10

14. To what degree are you now feeling:

Awake Sleepy

0 1 2 3 4 5 6 7 8 9 10

15. To what degree are you now feeling:

Lively 0 1 2 3 4 5 6 7 8 9 10 Listless

16. To what degree are you now feeling:

Refreshed 0 1 2 3 4 5 6 7 8 9 10 Tired

17. To what degree are you now feeling:

Energetic 0 1 2 3 4 5 6 7 8 9 10 Nonenergetic

18. To what degree are you now feeling:

Patient 0 1 2 3 4 5 6 7 8 9 10 Inpatient

19. To what degree are you now feeling:

Relaxed 0 1 2 3 4 5 6 7 8 9 10 Tense

20. To what degree are you now feeling:

Exhilarated 0 1 2 3 4 5 6 7 8 9 10 Depressed

21. To what degree are you now feeling:

Able to concentrate 0 1 2 3 4 5 6 7 8 9 10 Unable to concentrate

22. To what degree are you now feeling:

Able to remember 0 1 2 3 4 5 6 7 8 9 10 Unable to remember

23. To what degree are you now feeling:

Able to think clearly 0 1 2 3 4 5 6 7 8 9 10 Unable to think clearly

24. Overall, what do you believe is most directly contributing to or causing your fatigue?

25. Overall, the best thing you have found to relieve your fatigue is:

26. Is there anything else you would like to add that would describe your fatigue better to us?

27. Are you experiencing any other symptoms right now?

No

Yes. Please describe
