EXAMINATION OF ACUTE CARE NURSES ABILITY TO ENGAGE IN PATIENT EDUCATION RELATED TO PHYSICAL ACTIVITY AS A HEALTH BEHAVIOR

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EXAMINATION OF ACUTE CARE NURSES ABILITY TO ENGAGE IN PATIENT EDUCATION RELATED TO PHYSICAL ACTIVTY AS A HEALTH BEHAVIOR

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Physical activity is important for management and prevention of chronic disease. The current physical activity guidelines recommend engaging in physical activity for at least 30 minutes per day on at least 5 days a week. Acute care settings may present opportunities for patient education about physical activity. **PURPOSE:** The purpose of this study was to examine the ability of acute care nurses to engage in patient education regarding physical activity as a health behavior. Additionally, this study examined the influence of level of nurse training, age, personal physical activity and years of experience on these outcomes. **METHODS:** Nurses from an academic medical center (N=194) were surveyed. Knowledge of current physical activity guidelines, rank of importance of physical activity as a patient care activity and a healthy lifestyle behavior, and confidence to counsel patients about physical activity were queried. **RESULTS:** Of nurses queried, 32.5% reported days per week and 83% reported minutes per day to engage in physical activity consistent with current guidelines. Physical activity counseling was ranked least important of ten patient care activities and fifth as a healthy lifestyle behavior. The majority of nurses (51%) felt some degree of confidence to counsel patients regarding physical activity. Baccalaureate level nurses were more likely to be consistent with physical activity guidelines than master's level nurses. Nurses <25 years of age were more current in knowledge of physical activity guidelines than nurses ≥41 years of age. Nurses who exercised were more likely to report knowing current physical activity guidelines. Reported time spent counseling patients

regarding physical activity averaged 6 minutes per patient per day. **CONCLUSION:** Acute care nurses are counseling patients regarding physical activity although it is ranked least important of ten patient care activities. Future research should include studying: a variety of patient populations; other hospital settings; objective measures of evaluation; and nurses' training regarding physical activity.

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PREFACE

I would like to express my gratitude to my committee members for their guidance and support throughout my journey to complete this dissertation.

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1.0 INTRODUCTION

Chronic disease, defined as a non-communicable illness of prolonged duration which is rarely cured, contributed to the mortality of more than 1.7 million people in the United Sates in 2009. This accounts for 70 percent of all deaths in the United States according to the Centers for Disease Control and Prevention's (CDC's) National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP).[1] The three most common chronic diseases; heart disease, cancer and stroke, are responsible for greater than 50% of deaths each year.[1,2] Cardiovascular disease (heart disease and stroke) accounts for 33.6% of these deaths each year.[1,3] Nearly one in two Americans live with at least one chronic disease.[1] Chronic diseases are the most common and costly of all health problems. Ironically, they are also the most preventable.[1,2,4] Four common, but modifiable behaviors, are noted to be responsible for much of the chronic illness and disability. These behaviors include lack of or insufficient physical activity, tobacco use, poor eating habits or nutrition and excessive alcohol use.[1,2,5,6]

The 2008 Physical Activity Guidelines for Americans are the first comprehensive guidelines on physical activity to be issued by the Federal Government, and these guidelines identify the health benefits of regular physical activity.[7] The recommendation to promote and maintain health is for adults to engage in aerobic physical activity of a moderate-intensity for a minimum of 30 minutes on 5 days each week or vigorous-intensity for a minimum of 20 minutes on 3 days each week, and resistance exercise a minimum of 2 days each week. In light of the

fact that a dose-response relation exists between physical activity and health, greater benefit of physical fitness, greater risk reduction of chronic disease, and increased prevention of unhealthy weight gain may occur with amounts of exercise which exceed the minimum requirements set forth.[8]

More than a third of the US adults do not meet the minimum recommendations for aerobic physical activity based on the 2008 Physical Activity Guidelines for Americans, yet physical activity is vital to prevention of chronic disease.[1,7,8] Physical activity is known to not only improve overall health, but also to help prevent or lower the risk of many chronic diseases, specifically cardiovascular disease, diabetes, arthritis, and breast and colon cancer and all cause mortality.[7,8] All cause mortality is lowered by approximately 30% in active individuals.[8] Increased amounts of moderate or higher intensity physical activity are reported to lower morbidity or mortality for cardiovascular disease by 20% and 30% respectively.[8] Helmrich, et al demonstrated a decrease in relative risk of 6% for development of type 2 diabetes for each increase of 500 kilocalories in physical activity.[9] Similar benefits were demonstrated in other studies by Hu et al[10-11], Manson et al[12], Folsom et al[13], and Weinstein et al.[14] A longitudinal study demonstrated a statistically significant protection for osteoarthritis with increased physical activity such as cross-country skiing, swimming or walking with odds ratios ranging from 0.35 – 0.91.[15] Increased physical activity decreases the risk of breast cancer by 20-40% and the risk of colon cancer by 30%.[8] Thus, it is important to develop and implement effective interventions to promote physical activity across the population.

It has been suggested that healthcare providers be engaged in the promotion of physical activity to their patients. However, studies examining the effectiveness of physicians to promote physical activity in patients have resulted in only modest effects. For example, the P.A.C.E.

study demonstrated at a 3-6 week follow-up that 52% of the intervention group was exercising regularly compared to 12 % of the control group. This, however, equated to an average walking time of 11 minutes per day, which falls below the recommended guidelines.[16] Marcus et al[17] conducted a study to train physicians to counsel patients for physical activity. Although they demonstrated an initial increase of physical activity, at the 6 week follow-up there was no significant difference between the control and intervention group.[17] The ACT study[18] employed two intervention groups, one control, and a 24 month follow-up. At follow-up 26% of the counseling intervention group for women and 30% of the assistance group for men reported meeting the guidelines for physical activity compared to 1-2% at baseline. However, the time required for the interventions was longer than the physicians reported they actually allot for physical activity counseling. The estimated cost to the physicians over the two year period of the study was $500 per participant in the assistance group and $1100 per participant in the counseling group. Existing resources may prohibit these types of interventions.[18] A meta-analysis demonstrates that outcomes of the effectiveness of physician counseling are modest and short lived.[19]

An alternative to physicians counseling on physical activity may be to engage nurses in the process of promoting physical activity to patients. In fact, the American Nurses Association Standards of Nursing Practice state nurses are to engage in strategies to promote health, which may include educating patients and by personal example.[20] Of interest is that in outpatient care, the average time of office visits is 18 to 21 minutes.[21] Moreover, within the context of outpatient care, nurses engaged in counseling patients on physical activity for an average of 4 minutes and 26 seconds compared to physicians' time of 1 minute and 30 seconds.[22]

An alternative to outpatient care would be to engage in physical activity counseling of patients during in-patient hospital visits. The average length of stay in hospitals is 4.8 days,[23] and nurses spend approximately 20% of their time delivering direct patient care.[24,25] This may provide a unique opportunity to counsel patients on the benefits of physical activity, and to encourage engagement in this behavior upon discharge. However, few studies have examined whether nurses engage in physical activity counseling within in-patient settings, in particular within acute care in-patient settings, which is the setting for this proposed research study.

Nurses have indicated that a significant barrier to their engagement in patient education is their insufficient knowledge on selected health-related topics.[23] What is unclear from the literature is whether nurses, and in particular acute care nurses, have sufficient knowledge related to physical activity that can be used when educating patients on this important health-related behavior. Moreover, it is unclear whether additional factors influence the knowledge and engagement of nurses related to physical activity counseling of patients. This information will be valuable in the development of the training and education of nurses to engage in counseling for physical activity with patients.

1.1 SPECIFIC AIMS

This study will examine the following specific aims:

1. To examine and describe acute care nurses' knowledge of the current Physical Activity Guidelines for Americans.

2. To examine the degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities.
3. To examine the importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.).
4. To examine the self-efficacy of acute care nurses to counsel patients related to physical activity.

In addition, the following exploratory aims will be examined:

1. To examine if level of training of the acute care nurse (i.e., Diploma, Associates Degree, Bachelor of Science in Nursing, Master of Science in Nursing) influences:
    a. The acute care nurses' knowledge of the current Physical Activity Guidelines for Americans.
    b. The degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities.
    c. The importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.).
    d. The self-efficacy of acute care nurses to counsel patients related to physical activity.
2. To examine if the age of the acute care nurse influences:
    a. The acute care nurses' knowledge of the current Physical Activity Guidelines for Americans.

b. The degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities.
c. The importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.).
d. The self-efficacy of acute care nurses to counsel patients related to physical activity.

3. To examine if the personal physical activity behaviors of the acute care nurses influences:
    a. The acute care nurses' knowledge of the current Physical Activity Guidelines for Americans.
    b. The degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities.
    c. The importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.).
    d. The self-efficacy of acute care nurses to counsel patients related to physical activity.
4. To examine if years of experience influences:
    a. The acute care nurses' knowledge of the current Physical Activity Guidelines for Americans.
    b. The degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities.

c. The importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.).
d. The self-efficacy of acute care nurses to counsel patients related to physical activity.

2.0 REVIEW OF THE LITERATURE

2.1 CHRONIC DISEASE

Chronic disease contributes to approximately 70% of all deaths in the United States.[1,24] Chronic disease is a heavy burden on the health care resources in the United States with more than 75% of health care expenditures being spent on people with chronic disease.[25] Americans are becoming more aware of the high incidence of chronic disease. Not only do almost one in two Americans live with at least one chronic disease, but approximately 25% of the Americans with chronic disease experience one or more daily limitations related to their disease.[1,25] In a 2008 survey by the National Association of Chronic Disease Directors, approximately 66% of Americans supported more emphasis on chronic disease prevention and 84% supported public funding for prevention programs, even if it meant paying higher taxes.[26]

The leading chronic diseases that affect Americans are heart disease and stroke, cancer, diabetes, arthritis, obesity, respiratory diseases, and oral conditions.[24] Heart disease, cancer and stroke are the top three chronic diseases responsible for greater than 50% of deaths in the United States each year [1,2,24]and all can be directly affected by increasing physical activity. [7]

2.2 PHYSICAL ACTIVITY GUIDELINES

The 2008 Physical Activity Guidelines for Americans (PAG) advisory committee report states that in adults and older adults physical activity can lower the risk of: early death (all cause mortality); coronary heart disease; stroke; high blood pressure; type 2 diabetes; breast and colon cancer; falls; and depression.[5,7] The primary recommendations for adults to promote and maintain health included the following: aerobic physical activity of a moderate-intensity for a minimum of 30 minutes on at least 5 days each week or vigorous-intensity for a minimum of 20 minutes on 3 days each week and resistance exercise a minimum of 2 days each week. In light of the fact that a dose-response relation exists between physical activity and health, greater benefit of physical fitness, greater risk reduction of chronic disease, and increased prevention of unhealthy weight gain may occur with amounts of exercise which exceed the minimum requirements set forth.[7]

Early death, coronary heart disease, stroke, high blood pressure, type 2 diabetes, breast and colon cancer, falls, and depression risk can be lowered by physical activity. Listed below are the major recommendations for each of these categories based on the Physical Activity Guidelines for Americans.[7]

1. To reduce the risk of all cause mortality, the recommendation is for adults to engage in 120-150 minutes per week of moderate-to-vigorous-intensity leisure time physical activity (LTPA).
2. To reduce the risk of cardiovascular disease, the recommendation is for adults to engage in 150 minutes–200 minutes per week of moderate-intensity physical activity.
3. To improve metabolic health, the recommendation is for adults to engage in 120-150 minutes per week of moderate-to-vigorous-intensity physical activity.

4. Recommendations for energy balance are specific to whether the goal is to achieve weight maintenance, weight loss, or weight maintenance following weight loss. For weight maintenance the recommended dose of moderate-intensity physical activity is 150 minutes per week or to engage in vigorous-intensity physical activity for 75 minutes per week. For weight loss of 5%, the recommended dose is lower-intensity physical activity for 70 minutes per day, moderate-intensity physical activity for 45 minutes per day, or vigorous-intensity physical activity for 22 minutes per day. The recommendation for weight maintenance following weight loss is $\geq$ 300 minutes per week of moderate-intensity physical activity.
5. To improve pain management, function and quality of life in persons with arthritis, the recommendation is 130-150 minutes per week of moderate-intensity, low-impact physical activity.
6. To reduce fall risk in older adults, the recommendations include balance and strengthening activities for 30 minutes per session 3 times per week and moderate-intensity walking for 60 minutes per week.
7. To reduce the risk of breast and colon cancer, the recommendation is for moderate-vigorous-intensity physical activity a minimum of 30-60 minutes per day.
8. To reduce the risk of depression, the recommendation is for moderate-intensity physical activity 30-60 minutes per day on 3-5 days per week.

2.3 CARDIOVASCULAR DISEASE

The first and third leading causes of death for both men and women in the United States are heart disease and stroke, despite being among the most preventable chronic diseases.[27] Many risk factors exist for cardiovascular disease (coronary heart disease and stroke). Most of these risk factors for cardiovascular disease (e.g. hypertension, atherogenic dyslipidemia, type 2 diabetes, obesity) are metabolic which means they are responsive to, and therefore modifiable with, increased physical activity.[8] In general, when considering 'increased physical activity' for a positive effect on these risk factors, it assumes that the increase is over and above the normal activity of daily living.[8] Overall, the relationship between physical activity and cardiovascular disease morbidity and mortality can be expressed as a strong inverse relationship, which supports physical inactivity as a risk factor. Persons who report the least amount of activity have a 20% - 30% higher cardiovascular risk compared to persons who report moderate to higher amounts if physical activity.[8] Early work by Morris in the 1950's studied physical activity of work in coronary heart disease and found that those with lighter work had a higher incidence of heart disease compared to those with more active jobs.[48,49,50] There is also a demonstrated dose-response relationship. Those who exercise at least 60 minutes a week experience some benefit, but those who are more active with 150 or more minutes per week experience more benefit for decreased cardiovascular events.[8]

In the Harvard Alumni Study, men who increased their activity had a 17% lower coronary heart death rate than the men who did not increase their activity. Additionally, men who played moderately vigorous sports had the increased benefit of a 41% lower risk of coronary heart death rate.[32,50,52] The Nurses' Health Study reported that women who increased

their leisure time physical activity had cardiovascular disease rates lower than the women who did not increase their leisure time physical activity. For the women who began the study as sedentary and increased their physical activity, when reporting their activity in quartiles of metabolic equivalents (METS), their relative risks (RR) were 0.85, 0.79, 0.67, and 0.71 from quartile 1 to quartile 4 respectively ($p = 0.03$).[33]

The American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation issued a 2007 Update for the Core Components of Cardiac Rehabilitation/Secondary Prevention Programs. This update supported an initial core component of CVD risk reduction with promotion of an active lifestyle for patients with cardiovascular disease.[34] There is a relative risk reduction of 20% -35% of death in men and women who report increased levels of physical activity.[51] The core components address risk factor management by nutritional counseling, blood pressure control, lipid management, diabetes management, tobacco cessation, psychosocial management, physical activity counseling and exercise training. Increasing physical activity is listed as an intervention in all categories except tobacco cessation and psychosocial management.[35] Risk factor management, then, becomes an important focus.

Lee, et al conducted a meta-analysis on stroke studies[28] between 1966 and 2002 reported that persons who are very physically active have an overall 27% lower relative risk for stroke than those with low levels of activity ($p<0.001$). There were different levels of risk reduction in the type of the studies. Cohort studies reported persons with a high level of activity to have a 25% lower risk than those with low activity levels ($p<0.001$). Case-controlled studies reported a

64% lower risk of stroke in persons with high activity level ($p<0.001$). This study also looked at moderately active persons. The cohort studies showed moderately active persons had a risk reduction of 17% for stroke incidence compared to those with low activity levels ($p<0.001$). The case-controlled studies had a 48% lower incidence of stroke for persons with moderate activity levels compared to those with low activity levels ($p<0.001$). Combining the studies then calculated an overall risk reduction for stroke in persons with moderate activity levels of 20% ($p<0.001$). This study also looked at risk for ischemic vs. hemorrhagic stroke. Persons with high activity levels had a 21% lower risk of ischemic stroke and a 34% lower risk of hemorrhagic stroke compared to persons with low activity levels. Those with moderate activity levels reduced their risk for ischemic stroke by 9% and hemorrhagic stroke by 15% when compared to persons with low activity levels.[28]

Reimers, et al conducted a meta-analysis of studies[29] between 1982-2008 found that overall the risk of stroke is reduced by 20%-30% with regular physical activity compared to physically inactivity. Risk for ischemic stroke in women was reduced by 24% and by 27% in men. Hemorrhagic stroke reductions were 8% in women and 40% in men. Combined risk reduction was noted as 29% in women and 28% in men. This study did not show statistically significant protection for women against stroke with physical activity.[29]

Wendel-Vos et al did a meta-analysis [30]of some case-controlled and cohort studies in which they made a distinction between occupational and LTPA. Being very active at work reduced stroke risk by 43% and being moderately active reduced stroke risk by 36% when compared to being inactive. Stroke risk was reduced by 20%-25% when there was LTPA compared to those who were inactive. Those with active occupations had a reduced risk of ischemic stroke (RR=0.77) compared to those with inactive occupations (RR =0 .57) LTPA

reduced risk for total strokes (RR=0.78), ischemic stroke (RR=0.79, and hemorrhagic stroke (RR=0.74) when compared to those who were inactive. This study found a borderline significant effect (p=0.07) for gender in hemorrhagic stroke with LTPA vs. inactivity of RR=0.54 and RR=0.76 for males and females respectively.[30]

Sattelmair et al, studied subjects from the Women's Health Study[31] for the relationship between physical activity and stroke incidence and found a borderline significance p= 0.06 for total and ischemic stroke, but no trend for hemorrhagic stroke. While these relationships were not significant, there was an association with time walking and usual pace. The relationship was inverse and dose-responsive for both the usual pace and time spent walking. Walking for ≥ 2 hours per week reduced risk of stroke by 30% compared to women who did not walk (RR=0.70) and women who walked at a brisk pace (>4.8 km/hour) had a reduced risk of 37% compared to women who did not walk (RR=0.63). Ischemic stroke risk approached significance with p=0.07 for both time walking and pace of walking. Significant associations for hemorrhagic stroke, for time walking (p=0.002) and pace of walking (p=0.04) with risk reduction for women walking ≥ 2 hours per day of 57% (RR=0.43) and those walking at a pace of > 4.8km/hour of 68% (RR=0.31).[31]

2.4 ATHEROSCLEROSIS

Physical activity can modify atherosclerosis and improve lipid profiles.[28,29,31] In the Stanford Coronary Risk Intervention Prevention Project (SCRIP) study, risk of all strokes decreased by 22%, with ischemic stroke risk decreased by 21% and hemorrhagic stroke decreased by 26%. Physical activity was shown to partially reduce or slow progression of atherosclerosis.[36] During exercise there is an increased flow-mediated stress on the artery walls with resultant improvement in endothelial function. This is associated with increased synthesis and release of nitric oxide (NO). NO then acts as a vasodilator and inhibitor for atherogenesis and thrombosis formation.[37,38]

The response of the serum lipoproteins, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides (TG) is well documented in studies which show consistent data that HDL increases and TG decreases with consistent physical activity. The evidence for a favorable response of LDL to physical activity remains inconsistent.[8] However, there is evidence that favorable responses to HDL, TG, and LDL levels occurs with an energy expenditure (EE) of 10-12 MET hours per week.[39]

One meta-analysis of the effects aerobic exercise has on blood lipids showed an average increase of 4.6% of HDL-C levels, a 3.7% decrease in triglycerides, and a 5.0% decrease in the LDL-C.[53,55] The HEalth, RIsk factors, exercise Training, And GEnetics (HERITAGE) study showed a 3% increase of HDL-C level, a 2.7% reduction in triglycerides, and a 0.8% reduction in LDL-C in men and a 3% increase of HDL-C level, a 0.6% reduction in triglycerides, and a 4% reduction in LDL-C in women.[54,55]

In a meta-analysis of studies on HDL-C by Kodama et al[56], a modest increase in the HDL-C was seen with regular exercise. Their findings sought to quantify the amount of exercise

necessary to improve the HDL-C and found that 120 minutes of exercise with an estimated energy expenditure of >900 kcal/week were needed for significance at $p<0.001$.[56] There is some variability among the studies in the effect of exercise on atherosclerosis, but overall a modest positive response is seen.

2.5 HYPERTENSION

Physical activity can help decrease blood pressure in normotensive and hypertensive persons thus helping to reduce cardiovascular risk.[28,51, 57,58,59] The Harvard Alumni Study demonstrated that there was a 35% risk of developing hypertension in those who did not engage in vigorous physical activity.[60] A later study by Paffenbarger, et al demonstrated this effect as an inverse relationship between physical activity and the development of hypertension.[61]

Risk reduction related to hypertension has been documented with both aerobic and resistance exercise, although stronger evidence exists for aerobic exercise. Aerobic exercise of more than 800 MET minutes per week demonstrates a reduction of systolic and diastolic blood pressure.[8] A meta-analysis of 72 studies looking at the effect of aerobic exercise on resting blood pressure in adults noted a mean decrease in resting systolic blood pressure of -2-5mmHg and a mean decrease of -2-3mmHg in resting diastolic blood pressure. Adults who were known to have hypertension prior to the studies had a higher mean decrease of systolic blood pressure ranging from -6.9 to -4.9mmHg. This decrease in blood pressure is based on the decrease in systemic vascular resistance. A 2mmHg decrease in systolic blood pressure decreases the stroke mortality by 6% and the coronary heart disease (CHD) mortality by 4%. A 5mmHg in systolic

blood pressure decreases the stroke mortality rate by 14% and the CHD mortality rate by 9%. Thus, physical activity for blood pressure management is important for CVD prevention and risk reduction.[40]

A meta-analysis of studies from 1966-2001 demonstrated a net effect of physical activity on both systolic and diastolic blood pressure. Systolic blood pressure decreased -3.84 mmHg ($p=0.001$) and diastolic blood pressure decreased -2.58 mmHg ($p=0.001$). As trials were excluded in which exercise was not supervised, those in which antihypertensive medications were administered, and those with multiple interventions, the reductions in both systolic and diastolic blood pressure increased to -4.39mmHg and -2.97 mmHg respectively.[62]

A review of clinical trials by Arroll and Beaglehole showed an average systolic and diastolic reduction of - 6 mmHg – 7mmHg in both normotensive and hypertensive persons.[63] In another early work, Fagard performed a meta-analysis[64] and found a net decrease of -5.3 mmHg and -4.8 mmHg for systolic and diastolic blood pressure respectively. He further analyzed the effect for persons who were normotensive (-3.0 mmHg systolic, -3.0 mmHg diastolic), borderline hypertensive (-6 mmHg systolic, -7 mmHg diastolic), and hypertensive (-10 mmHg systolic, -8 mmHg diastolic) thus demonstrating an increased reduction of blood pressure with physical activity in those with higher blood pressures at the start of increased physical activity.[64]

Kelley analyzed studies from 1963-1992[65] which evaluated the association of regular physical activity to resting blood pressures in adults. Reductions in systolic blood pressure were approximately 2% and reductions of diastolic blood pressure were approximately 4%. Correlations between the duration of physical activity training and reductions in resting blood pressures were significant at $p<0.05$.[65] Reaven, et al[66] studied the relationship between LTPA and blood pressure in older women and found reduction rates of overall hypertension, systolic

and diastolic blood pressure to be significant ($p<0.05$) for women who engaged in physical activity at any intensity level when compared to sedentary women.[66]

Although stronger evidence exists for effect of aerobic exercise on blood pressure, some effect is also seen with resistance exercise. Kelley and Kelley performed a meta-analysis[67] on controlled trials from 1966 to 1998 engaging only resistance exercise as the intervention. Changes in resting blood pressure ranged from -2 mmHg to -3 mmHg and -2 mmHg to -4 mmHg for systolic and diastolic blood pressure respectively. Although these reductions were not statistically significant, even small changes in blood pressure can help to reduce the risk of cardiovascular disease.[67]

2.6 TYPE 2 DIABETES

The benefit of physical activity for type 2 Diabetes Mellitus (T2DM) is well documented with improvements in glycemic control, blood glucose levels, and insulin sensitivity, all metabolic parameters. Therefore, exercise should be a component of disease management for persons with T2DM as a chronic disease in and of itself, as well as a cardiovascular risk factor.[44] Physical activity is also associated with primary prevention of type 2 diabetes. Helmrich, et al[68] demonstrated a reduced risk of type 2 diabetes by 6% for each increase of 500kcal of energy expenditure per week. Additionally, this benefit was seen in those with the highest risk for development of diabetes (i.e. high body mass index).[68] Manson, et al[69] supported this finding in a study of U.S. male physicians. The incidence of type 2 diabetes was inversely related to the frequency of vigorous-intensity physical activity. Those who exercised with vigorous-intensity

physical activity ≥ 5 times per week had a 42% risk reduction for type 2 diabetes than those who exercised with vigorous-intensity < once per week.[69]

One study compared a lifestyle intervention consisting of exercise (a minimum of 150 minutes of physical activity per week) and weight reduction (7% weight loss) with the administration of metformin to reduce the incidence of type 2 diabetes mellitus. Incidence of type 2 diabetes mellitus was reduced by 58% in the lifestyle intervention group and 31% in the metformin group when compared to the control group.[70]

Physical activity is also important for the management of type 2 diabetes. One study associated a 39%-54% reduction in all cause mortality and a 39%-53% reduction in cardiovascular disease in diabetics with walking at least 2 hours per week.[71] A meta-analysis of controlled studies for association of physical activity and reduction in glycosylated hemoglobin showed that physical activity interventions reduced the glycosylated hemoglobin by -0.66% (glycosylated hemoglobin in the post intervention group = 7.65% vs. 8.31% in the control group) which was both clinically and statistically significant.[72] A meta-analysis by Umpierre et al[73], analyzed studies with structured physical activity vs. advice only for reductions in glycosylated hemoglobin. Physical activity in these studies was aerobic, resistance or a combination of aerobic and resistance exercise. In structured physical activity training, the overall reduction in the glycosylated hemoglobin was 0.67% compared to a reduction of 0.43% in the advice only groups. Greater reductions were associated with increased physical activity of >150 minutes per week (0.89% decrease in glycosylated hemoglobin) and lower with physical activity of ≤ 150 minutes of physical activity per week (0.39% decrease in glycosylated hemoglobin).[73]

Pancreatic β-cell function and insulin resistance are also important in the incidence of type 2 diabetes. The relationship between the secretion of insulin and the insulin resistance is

expressed as the disposition index (DI). As changes in insulin sensitivity occur, the DI is a measure of how well the β-cells compensate for the changes. Typically this level is high, but decreases as type 2 diabetes occurs. The Studies of a Targeted Risk Reduction Intervention through Defined Exercise (STRRIDE) study analyzed data for the effect of physical activity on the DI. In low-intensity and vigorous-intensity physical activity groups the DI bordered on significance with $p=0.063$. The moderate-intensity physical activity group was significant at $p< 0.035$.[74] A study in older women who engage in regular exercise demonstrates protection against the development of insulin resistance whereas insulin sensitivity declines in physically inactive older adults. The study utilized three intensity groups, low, moderate and high and kept exercise volume consistent at 300kcals per exercise session. Only the group with the high-intensity activity showed statistical improvement $p=0.02$. [75]

Based on the Physical Activity Guidelines for Americans, diabetics should engage in a minimum of 150 minutes of moderate-intensity physical activity per week, or 75 minutes of vigorous physical activity per week. Based on that recommendation and comparing results from the 2007 Behavioral Risk Factor Surveillance Survey, 42% of older adults overall met the recommendations for total physical activity and diabetics were 34% less likely to engage in physical activity at recommended levels ($p<0.001$). Education about the benefits of physical activity in type 2 diabetes is important for healthcare professionals.[76]

2.7 OBESITY

The overall prevalence of the obesity in the US in 2007-2008 was 33.8% with 32.2% of men and 35.5% of women being obese. While obesity may differ in age, racial and ethnic groups for both men and women, it exceeds 30% in most groups. Obesity is a risk factor for cardiovascular disease (coronary heart disease and stroke), certain cancers, and other chronic diseases including diabetes, hypertension and dyslipidemia.[77]

Obesity effects on the cardiovascular system include an increase in total blood volume and subsequent cardiac output to meet the metabolic needs of the excess body weight.[78] Obesity is also associated with several risk factors that include but are not limited to dyslipidemia, hypertension, inflammatory markers and diabetes.[77,78,82,83,85] Obese patients are often hypertensive related to the increased cardiac output which leads to an increase in oxygen demand.[78] Weight loss will decrease blood pressure in a dose-response manner as greater improvement in blood pressure is seen with greater weight loss.[80]

Obesity is associated with increased cardiovascular disease mortality rate. These mortality rates are directly associated with body mass index (BMI) levels in both men and women. Cardiovascular mortality is 2-3 times greater in individuals with a BMI of $\geq 35 kg/m^2$ than in individuals with a BMI of 18.5 to 24.9 kg/m^2.[79,80] Data from the Nurse's Health Study associated obesity with an increased risk of coronary heart disease which were independent of physical activity levels.[81]

Inflammatory markers are increased in obesity. Overproduction of TNF-α occurs in the adipose tissue and contributes to insulin resistance.[82] Obesity is also associated with elevated levels of C-reactive protein (CRP) and fibrinogen. The chronic inflammation present in obesity may contribute to the increased risk of atherosclerosis in obese individuals.[83] A randomized

controlled clinical trial utilized diet-induced weight-loss intervention with an exercise arm to assess the effect on chronic inflammation in obese adults. This study did not demonstrate a significant effect from exercise, but the diet-induced weight loss intervention showed significant reductions of CRP (p=0.01), interleukin 6 (p=0.009) and TNF-α (p=0.007).[84]

Obesity and physical inactivity are risk factors for type 2 diabetes. A recent review noted obesity to be a stronger independent risk factor than physical inactivity. In these studies, relative risk of the individual effect of obesity ranged from 4.10 to 17.5 (4.10, 5.62, 10.74, 8.75, 17.5) while the relative risk individual effect of physical inactivity ranged from 1.12 to 2.08 (2.18, 1.12, 2.08, 2.00, 1.25) respectively.[85]This may be related to the increase in free fatty acids in the adipose tissue which leads to a decrease in insulin sensitivity leading to hyperglycemia, insulin resistance and subsequently, type 2 diabetes.[85]

In The Look AHEAD clinical trial, adults with type 2 diabetes with overweight or obesity (BMI ≥ 25.0 kg/m²) were examined for associations of measures of cardiovascular and metabolic function and body composition with exercise capacity. People with higher BMI and waist circumference had lower exercise capacity. Conversely, those with the lower BMI and waist circumference had the highest exercise capacity. Exercise capacity was express as METs. The categories for BMI were overweight (≥25.0kg/m^2), Class I (30-34.9kg/m^2), Class II (35-35.9kg/m^2) and Class III (≥40kg/m^2). Participants in the overweight category had an overall MET of 8.5 ± 0.06, Class I MET of 7.8 ± 0.04, Class II MET of 6.9 ± 0.04, and Class III MET of 5.8 ± 0.05, demonstrating the declining exercise capacity as BMI increases. The categories for waist circumference were 1= waist circumference of < 100cm, 2 = 100-104.9cm, 3 = 105-114.9cm, 4 = 115-119.9cm and 5 = ≥120cm. The MET values associated with these categories are 1 = 7.5 ± 0.07, 2 = 7.6 ± 0.06, 3 = 7.0 ± 0.05, 4 = 7.3 ± 0.06, and 5 = 6.7 ± 0.06. Categories

1 and 2 were associated with the highest METs indicating higher exercise capacity, while category 5 was associated with the lowest METs indicating lower exercise capacity. When adjustments were made for BMI and age, an independent association of higher waist circumference to lower exercise capacity remained ($p<0.0001$) for both men and women.[86] In addition to affecting exercise capacity, this central obesity is associated with type 2 diabetes and cardiovascular disease, and therefore warrants research for interventions which can target central adiposity.[86]

In light of the fact that obesity, a chronic disease itself, is a risk factor for cardiovascular disease, diabetes, atherosclerosis, and inflammatory markers, interventions to achieve weight loss are important. Moreover, it is important to engage in physical activity in amounts large enough to decrease body weight.[88] While the Physical Activity Guidelines for Americans recommend 150 minutes of moderate-intensity physical activity per week or 75 minutes per week of vigorous-intensity physical activity for weight maintenance, higher levels of physical activity are needed for weight loss. For a 5% weight loss, the recommended dose is 70 minutes per day of low-intensity physical activity, 45 minutes per day of moderate-intensity physical activity or 22 minutes per day of vigorous-intensity activity. This recommendation increases to $\geq$ 300 minutes per week of moderate-intensity physical activity to maintain weight following weight loss.[7]

2.8 METABOLIC SYNDROME

The most recent figures from the 2003-2006 National Health and Nutrition Examination Survey report that the US prevalence of metabolic syndrome is 34%. Prevalence of risk factors for Metabolic Syndrome include, abdominal obesity 53%, hypertension, 40%, hyperglycemia 39%, hypertriglycerides 31% and low HDL-C 25%. The prevalence of metabolic syndrome increases with increased BMI: 65% of obese men and 56% of obese women.[43,90]

The Coronary Artery Risk Development in Young Adults (CARDIA) study included over 5000 participants men and women, black and white between the ages of 18 and 30. The study sought to describe the association of the metabolic syndrome with the demographic characteristics of the group and to identify modifiable risk factors for the development of metabolic syndrome. Metabolic Syndrome is defined by the National Cholesterol Education Program Adult Treatment Panel III (ATP III) as the presence of a minimum of three of the following: fasting glucose ≥6.1 mmol/l, waist circumference >88cm (women) or > 102cm (men), systolic blood pressure of ≥ 130mmHg or diastolic blood pressure of ≥85mmHg, triglycerides of ≥ 1.7 mmol/l, HDL cholesterol <1.3mmol/l (women) or < 1.04mmol/l (men). This study found that physical activity was inversely associated with risk for metabolic syndrome and that young adults who were physically active on a regular basis were at lower risk to develop metabolic syndrome.[41]These modifiable risk factors of the metabolic syndrome can lead to development of heart disease and diabetes.[42]

The HERITAGE Study sought to determine the effect of aerobic physical activity as treatment for the metabolic syndrome. The prevalence of the individual risk factors (high triglycerides, low HDL-C, hypertension, hyperglycemia, and high waist circumference were all

significantly decreased ($p < 0.05$) post 20 weeks of aerobic exercise training.[91]There is a reduced risk of metabolic syndrome with regular physical activity.[89]

2.9 CANCER

Cancer is the second leading cause of death in the U.S. with a lifetime risk of development of cancer at 45% for men and 38% for women.[45] Occupational or LTPA is associated with lower rates of colon and breast cancer. Moderate-intensity physical activity (METs > 4.5), i.e. mowing a lawn, is associated with higher risk reduction for cancer than low-intensity physical activity. A 30%-40% risk reduction for colon cancer is seen in physically active men and women when compared to physically inactive individuals. Breast cancer reduction is 20%-30% in physically active women compared to physically inactive women. In addition to this primary prevention of cancer by physical activity, there is some association of LTPA and death from breast cancer and colon cancer. While more research is needed in this area, there is an association of physical activity in cancer patients with quality of life.[51]

In a study by Lee, et al[45], the prevalence of cancer mortality was 62% lower in men who were physically active, never smoked and had a normal waist girth when compared to men who did not have any low risk factors.[45]In breast cancer, cardiorespiratory fitness (CRF) is noted as a modifiable risk factor. Women with moderate to high CRF had a 33% and 55% lower risk for breast cancer compared to women with low CRF. An exercise capacity of < 8 METS increased risk for breast cancer three times that of women who had an exercise capacity of ≥ 10 METS ($p=0.007$)[46] Monninkoff et al[47] studied the relationship of physical activity and breast cancer in

postmenopausal women. They found a very large inverse relationship ranging from 20-80% decrease in the incidence of the disease in women who were physically active.[47]

In obese cancer patients, the increased levels of inflammatory markers and consequent effects on insulin metabolism appear to facilitate proliferation and survival of cancer cells, thus predictive of poor cancer prognosis.[92] Data analysis from the Nurse's Health Study showed that weight gain post breast cancer diagnosis was associated with a 50% higher rate of recurrent breast cancer and death.[93]Studies such as the HEAL study reported a 50%-53% risk reduction of death in women who were physically active post breast cancer diagnosis compared to women with no LTPA with the maximal benefit occurring in women who walked at a brisk pace 3 hours per week.[94]

2.10 PHYSICAL ACTIVITY COUNSELING

With physical activity being so strongly linked to decreasing modifiable risk factors for chronic disease, a responsibility exists for counseling about the benefits of physical activity. It has been suggested that healthcare providers be engaged in the promotion of physical activity to their patients. However, the effectiveness of these interventions has resulted in mixed success.

Physicians cite lack of time, lack of reimbursement, lack of knowledge about physical activity and lack of training in the area of behavioral counseling as barriers to promotion of physical activity.[16,95] The original Physician-based Assessment and Counseling for Exercise (PACE) study in the 1990's[16] was a minimal intervention strategy based on the transtheoretical model of behavior change and social-cognitive theory. The primary aim was promotion of

moderate-intensity physical activity with advice for sedentary patients. Only physicians who were interested in physical activity counseling were recruited. After the initial counseling, patients returned for follow-up at 3-6 weeks. At that time, 52% of the intervention group were exercising regularly compared to 12% of the control group. Although this represented a statistically significant increase ($p<0.05$), it actually equated to an average walking time of 11 minutes per day which falls below the recommended guidelines.[16]

Van Slujis et al conducted a randomized clinical trial[95] in the Netherlands utilizing techniques from the PACE study to evaluate effectiveness of physical activity counseling in a general practice setting. The practices were voluntary with no specific inclusion criteria and included rural and city practices. Patients were sedentary adults with type 2 diabetes, hypertension or hypercholesterolemia and able to engage in moderate-intensity physical activity. The intervention consisted of 2 office visits, baseline and a 4 week follow-up, with a phone call at 2 weeks and 8 weeks after the 4 week follow-up office visit. The participants were also asked to fill out questionnaires at the 8 week follow-up, 6 months and then a year. The control group received brief advice about physical activity. No statistically significant effects for stage of change were seen although 34.5% of the control group and 36.1% of the intervention group progressed at least one stage and overall 79.9% were either in the action or maintenance stage of change at 1 year. No statistically significant intervention effects in physical activity were seen, however both groups increased total physical activity by 61.6 minutes and leisure time physical activity increased by 61.8 minutes. This increase was statistically significant for both groups.[95]

In a study by Marcus et al[17] the participants were $\geq$ 50 years of age with activity less than 3 times per week for only 20 minutes per physical activity session. This self reported study utilized the Physical Activity Scale for the Elderly (PASE). Physicians in this study attended a 2

hour training session and were paid $45.00 for each office visit intervention. The intervention was 3-5 minutes of individualized counseling and assessment of stage of change (precontemplation, contemplation or preparation). Participants also received written information. The patients received the intervention, a follow-up phone call at 2 weeks and a follow-up phone call at 6 weeks. PASE scores increased in the intervention group from a mean of 148 to a mean of 154. No change was seen in the scores of the control group (PASE score 124.9 at baseline and 125.3 at follow-up). No significant group changes in the PASE scores were obtained $p>0.05$. At the end of this study, however, physicians reported high self-efficacy in physical activity counseling.[17]

The Activity Counseling Trial's (ACT)[11] primary aim was to test the effects of education and counseling for physical activity in the primary care setting. This study had two intervention groups, one control group and a 24 month follow-up. The control group (advice) received advice and written educational materials about physical activity. The first intervention group (assistance) received all of the components of the control group plus interactive mail and behavioral counseling by the physician. The second intervention group (counseling) received all of the components of the advice and assistance groups plus regular telephone counseling and behavioral classes. At follow-up 26% of the counseling intervention group for women and 30% of the assistance group for men reported meeting the guidelines for physical activity compared to 1-2% at baseline. However, the time required for the intervention was longer than the physicians allotted for physical activity counseling. The cost was much higher than anticipated which may be a deterrent for this type of intervention.[11]

A national study of physician awareness and adherence to cardiovascular disease prevention guidelines was conducted by Mosca et al.[96] In this study Primary Care Physicians

(PCPs), Cardiologists, and OBGyns were asked to participate. Monetary incentive was offered for completed on-line surveys. Physicians reported spending an average of 8 minutes counseling patients regarding lifestyle changes, but <5% were advising patients to be physically active ≥ 6 days per week. The physicians' self-report of their effectiveness in counseling about physical activity revealed PCP rating of 12.7%, OBGyn rating of 9% and Cardiologist rating of 12%. Barriers to physical activity counseling cited by the physicians included lack of time and lack of re-imbursement by insurance companies.[96]

According to a systematic review of clinical counseling of physical activity, 40% of US physicians consistently provide counseling for physical activity and 15% provide actual physical activity prescriptions. The majority of the studies included voluntary mail-in questionnaires. There were two direct observations studies and these studies found the lowest rates of physical activity counseling. Overall, there is a demonstrated need for physical activity counseling and the efficacy of physician counseling has been modest and short-lived in general.[19]

Historically, nurses play an important role in education for patients and families, both in outpatient areas and at the bedside.[97] Many approaches to patient teaching have been successful in the past. One such approach, in the Stanford/Lockheed Exercise Study, was telephone-assisted counseling for physical activity after a face-to-face session. Physical activity was prescribed 5 days per week at 65%-75% of max heart rate. The telephone-assisted counseling yielded significant improvements in functional capacity (increase in VO_2max of 15% in men and 9% in women) and high exercise adherence rates (90% in men and 75% in women).[99] An advanced practice nurse led telephone intervention for heart failure patients was based on Orem self-care deficit theory. The nurse must address the knowledge deficit of the patient to arm the patients with the necessary knowledge to engage in healthy self care behaviors. In this study

patients had significantly fewer hospital readmissions ($p=0.013$) and self care behaviors in the intervention group improved significantly ($p<0.001$).[98]

In nursing education program, nurses learn that patient teaching is an important nursing role. In fact it is patient teaching that helps to distinguish nurses from other health care professionals. When nursing diagnoses are developed, they often start with the words 'knowledge deficit'. A basic assumption of all acute care, bedside nurses is that all patients need to be taught 'something'. This is reinforced by that fact that 'patient teaching' is a category included on all documentation forms. The Joint Commission on Accreditation of Health Organizations (JCAHO) requires proof that patient teaching is being done. No patient is discharged from the hospital without discharge instructions. Simply imparting knowledge, however, is not sufficient to change behavior. Behavior change is dependent on stage of change, motivational level, and identifying barriers to change. Utilizing an integration of these approaches can be effective in clinical areas even when time for teaching is limited.[100]

When patients are hospitalized, many educational needs may be identified: medication knowledge, risk reduction, diet, exercise, healthy lifestyle practices. In stroke patients, JCAHO requires proof of education with a tool such as the Stroke Knowledge Assessment Tool (SKAT) or Get With the Guidelines-Stroke tool and includes patient teaching as a requirement for certification as a primary stroke center. Bedside nurses remain on the forefront for patient teaching.[101]A study of oncology patients showed that 84% would prefer to be counseled about the benefits of physical activity during their acute cancer experience.[94] In specialized units, nurses can deliver consistent education for the many patient educational needs during patient encounters.[102] Education provided in the hospital setting can be reinforced with available printed materials, pictures, diagrams, etc. and can be evaluated by return demonstration or explanation

by the patient.[103]An additional benefit of providing education in the acute care setting is that the education is occurring in time orientation. Time orientation refers to the timeframe within which an event occurs. This tends to motivate patients to make goal decisions associated with the current situation and possible future outcomes.[104] This may also be called the 'teachable moment' during which patients are most receptive to consider and make lifestyle changes.[105]

In 2006 the Helsinborg Declaration identified patients being given adequate advice about healthy lifestyles as on of the core indicators for quality of care. Lack of knowledge of and/or noncompliance with healthy behaviors are often the reason that risk factors for chronic disease remain unchanged.[106] While nurses have a responsibility to teach patients about healthy lifestyles, they often note a deficiency in their own knowledge which limits their ability to provide lifestyle counseling.[107]This health promotion is vital for patients, but also for nurses to model self care with healthy behaviors for their patients.[108]

Nurses in the acute care setting may be in an optimal position to counsel patients on healthy lifestyles behaviors, particularly physical activity. However, no studies exist in the literature to describe: the knowledge level of acute care nurses in regard to physical activity guidelines; if acute care nurses engage in physical activity counseling on any regular basis; or how acute care nurses prioritize physical activity counseling.

3.0 METHODS

3.1 RESEARCH DESIGN

This was a descriptive study to examine acute care nurses' self reported knowledge of, and confidence and prioritization to engage in patient education related to Physical Activity as a Health Behavior to study the specific aims set forth in Chapter 1. A survey was employed to obtain data from the individual nurses.

3.2 SUBJECTS

This study proposed to recruit acute care nurses from a quaternary, level one trauma, academic medical center. This academic medical center is a 700 bed adult, quaternary, level one trauma center to which approximately 32,000 patients were admitted in 2011. Unit specialties include cardiac surgery, cardiology, neurology, neurosurgery, trauma, vascular surgery, orthopedics, medicine, critical care medicine and multiple transplant specialties. Ten units were included in the research study; five cardiac and five neurology/neurosurgery units. Approval was obtained from the hospital's research review committee and the Institutional Review Board of the University of Pittsburgh. The pool of nurses eligible to participate in the survey was 263. Thus,

this study targeted 40% of the eligible nurses to complete the survey that examined the specific aims, and this is justified in Section 3.6.

Nurses were eligible to participate if they were assigned to the ten identified units which are general or adaptable acuity units in the hospital.

3.3 RECRUITMENT

Each nurse at this academic medical center who works on an identified inpatient units received a survey with an explanation of the research study that included an invitation to participate in this survey voluntarily. (Appendix A) Survey distribution on each of the units was based upon the direction of the Unit Directors for the best method of distribution, for example, placing the surveys in each nurse's unit mailbox. Each nurse also received an enclosed envelope for them to place the completed survey in and seal prior to placing the survey in the collection containers on the unit. All surveys were identified numerically for each nurse's name. (#1 – Nurse 1, etc. to #263). The Principal Investigator (PI) kept the list of units, names, and numbers for each of the surveys. (Example: Unit A = numbers 1-30 = nurses 1-30, Unit B = numbers 31-45 = nurses 31-45, etc.) Once each nurse was marked as returning the survey, the identifying list was kept under lock and key to maintain confidentiality for each research subject completing the survey. Once the data collection was completed, the PI destroyed all linking code information for the surveys. A snack (small bag of pretzels) was stapled to each survey in appreciation of the nurses' participation in the research. In addition to the explanations, flyers were posted in the staff lounges and staff bathrooms on the participating units reminding the nurses of the ongoing

survey. (Appendix B) The Unit Directors also received a letter describing the research. (Appendix C) The Principal Investigator (PI) rounded on each of the units on a daily basis during the survey collection to remind the nurses of the ongoing survey in an effort to achieve the desired response rate and to check on the posted flyers. Missing flyers were replaced as necessary. These rounds took place during all shifts. During these rounds, completed surveys were collected to monitor the desired response rate.

3.4 SURVEY

The survey included demographic data and questions regarding self reported knowledge level of the 2008 Physical Activity Guidelines for Americans, the nurses' comfort in counseling patients about physical activity, how the nurses prioritize counseling about physical activity among ten nursing care activities and how they prioritize physical activity among ten healthy lifestyle behaviors. The demographic data included questions regarding gender, age, race, level of initial RN training, highest level of nursing education obtained, years of experience in nursing, unit, and years working on that unit, and self reported assessment of personal activity level. (Appendix D)

3.5 SURVEY COLLECTION

Survey collection was done by the Principal Investigator (PI). In each survey packet there was an enclosed envelope for them to place the completed survey in and seal prior to placing the survey in the collection containers on the unit. A collection container was placed in the staff lounge on each unit. Reminder signs were posted in the staff lounge, nurses' station (if permissible), and staff bathrooms on each unit. During the survey collection period, personal daily rounds were made by the PI to remind staff about the survey. The PI collected completed surveys each day from the collection containers. As completed surveys were collected, the PI opened the sealed envelopes and crossed the nurse's name off the master list. At the end of the second week of survey collection, surveys were re-distributed by the PI to the nurses who had not completed a survey. All nurses who had not completed the survey received a reminder letter (Appendix E) with another survey. Surveys were collected for one additional week at which time the response rate was calculated.

3.6 ANTICIPATED RESPONSE RATE

A paper and pencil survey was chosen because it has been demonstrated in studies that the response rates are higher in paper-based surveys than in electronic surveys for nurses with a reported response rate range of 50% - 56%.[109] While some younger hospital nurses prefer electronic surveys, older nurses prefer paper surveys. Other factors noted for hospital nurses include: the electronic surveys often take more time; if they are in the middle of a electronic

survey and a crisis occurs, the survey is often lost or left incomplete; and evening and night nurses prefer to complete paper and pencils surveys during breaks.[110]A survey study done at the facility that was used in this research, using a similar sample base, obtained a response rate of 41%.[111]Recommended response rates in the literature are inconsistent and variable reporting ranges from 15% to 80%.[112]Therefore, in consideration of the literature, the short survey collection time and the time of year (late spring to early summer) of the survey collection, the desired response rate was set at 40%. There were 263 nurses employed on the inpatient units at the academic medical hospital that was surveyed for this study. The achieved response rate was 194 (73.8 %)

3.7 DATA MANAGEMENT

The form design, data entry and data verification was performed in Teleform (a Windows-based software package for automated data entry and verification). Verified scanned data are exported to a secure Oracle database (version 11g, Oracle Corp., Redwood Shores, CA) having security settings and password policy enforcement and maintained on a centralized server at the Network Operating Center, an off-site, 24/7 facility operated by the University of Pittsburgh. Data was accessible only to the researcher involved in the study.

3.8 STATISTICAL ANALYSIS

For data analyses, SPSS for Windows (version 20, IBM Corp., Armonk, NY) was used.

Aims 1 through 4 were descriptive and were analyzed using frequency distributions and summarized using appropriate measures of central tendency and dispersion, considering the level of measurement of each variable and its data distribution. Nominally scaled variables (e.g., gender, ethnicity, and race) were summarized using the mode and range as measures of the central tendency and dispersion. Ordinally scaled variables (e.g., age grouping, years of nursing practice, initial nursing training, highest degree of nursing education, Likert-scaled responses) were summarized using medians and semi-quartile ranges as measures of central tendency and dispersion. All ratio data (e.g., report of personal activity and guideline recommendations) was summarized using means and standard deviations as measures of the central tendency and dispersion. However, nonparametric summary statistics (i.e., median and semi-quartile range) were used, if data were not normally distributed or had valid outliers.

Appropriate group comparative statistical methods were applied when exploring associations between level of training of the acute care nurse (Exploratory Aim 1), age of the acute care nurse (Exploratory Aim 2), personal physical activity behaviors of the acute care nurses (Exploratory Aim 3), and years of experience (Exploratory Aim 4) with a) the acute care nurses' knowledge of the 2008 Physical Activity Guidelines for Americans, b) the degree to which acute care nurses prioritize counseling patients on physical activity compared to other patient care responsibilities, c) the importance that acute care nurses place on physical activity behavior compared to other lifestyle health-related behaviors (i.e., smoking cessation, nutrition education, weight management, etc.), and d) the self-efficacy of acute care nurses to counsel

patients related to physical activity. In general, nonparametric summary statistics (median and semi-quartile range) and the Kruskal-Wallis procedure were used to describe and compare groups for the ordinally scaled variables of level of training of the acute care nurse (Exploratory Aim 1), age of the acute care nurse (Exploratory Aim 2), personal physical activity behaviors of the acute care nurses (Exploratory Aim 3), and years of experience (Exploratory Aim 4) on ordinally scale outcome variables (e.g., acute care nurses' knowledge of the 2008 Physical Activity Guidelines for Americans). For ratio-scaled outcome variables (e.g., reports of number of minutes on number of days each week and resistance exercise a minimum of numbers of days each week), parametric summary statistics (mean and standard deviation) and analysis of variance procedure were used to describe and compare groups for the ordinally scaled variables of level of training of the acute care nurse (Exploratory Aim 1), age of the acute care nurse (Exploratory Aim 2), personal physical activity behaviors of the acute care nurses (Exploratory Aim 3), and years of experience (Exploratory Aim 4). If the underlying assumptions for ANOVA could not be satisfied, nonparametric summary statistics (median and semi-quartile range) and the Kruskal-Wallis procedure were used to describe and compare groups.

4.0 RESULTS

The purpose of this study was to describe: the self-reported knowledge level of acute care nurses in regard to current physical activity guidelines; how acute care nurses prioritize physical activity counseling in relation to other patient care activities; how acute care nurses prioritize physical activity as a lifestyle health-related behavior in relation to other lifestyle health-related behaviors (i.e. weight management, smoking cessation); and the self-reported level of confidence to counsel patients about physical activity. Exploratory analyses were also conducted to examine the influence of nurses' level of training, age, personal physical activity behavior, and years of nursing experience on these outcomes.

4.1 SUBJECT CHARACTERISTICS

Surveys were distributed to nurses employed on 10 units (5 cardiac units and 5 neurology units) in an academic medical center. The pool of nurses eligible for the study was 263: of these, 194 returned surveys, yielding an overall response rate of 73.8%. Approximately half (51%) of the respondents were from cardiac units and 49% from neurology units. Table 1 provides a summary of the surveys distributed and returned for each unit included in this research study.

Table 1: Unit response by service line

Variable	Number of Eligible Staff	Number of Questionnaires Returned	% Response Rate
Cardiac Service Line			
Unit 1	26	15	57.7
Unit 2	29	22	75.8
Unit 3	28	21	75
Unit 4	29	19	65.5
Unit 5	29	22	75.8
Total Cardiac	141	99	70.2
Neurology Service Line			
Unit 6	30	24	80
Unit 7	24	18	75
Unit 8	17	17	100
Unit 9	26	19	73.1
Unit 10	25	17	68
Total Neurology	122	95	77.8
Total All Units	263	194	73.8

Table 2 provides a summary of the demographic characteristics of the 194 survey respondents. Approximately half (n=92; 47%) reported their initial training was a baccalaureate degree, with the remaining prepared initially with an associates degree (n=62; 32%) or diploma preparation (n=40; 20.6%). Of the respondents, 29(14.9%) had pursued higher education beyond the diploma level (n=11) or associates degree nurses level (n=18) and 14(7.2%) achieved a master's degree. Respondents were predominately female (89.2%) and Caucasian (89.6%). Five age categories were defined and over half (52.1%) of the respondents were in the 25-30 or 31-40 age range with 16% in the 41-50 year age range and 19.6% over the age of 50. The majority

were employed full time (85.1%) . Almost half (49.5%) had less than 6 years experience, with the greatest majority (42.8%) having between 1-5 years of experience.

Table 2: Demographic Characteristics of Survey Respondents and Comparison Between Cardiac and Neurology Service Lines

Variable	Cardiac Service Line 99(51%)	Neurology Service Line 95(49%)	Total 194(100%)	X^2 K-W	ρ-value
Initial RN Training				4.472	.107
Diploma	21(21.2%)	19(20.0%)	40(20.6%)		
Associate Degree	25(25.3%)	37(38.9%)	62(32.0%)		
BSN	53(53.5%)	39(41.4%)	92(47.4%)		
Highest Nursing Degree				3.499	.322
Diploma	17(17.2%)	12(12.6%)	29(14.9%)		
Associate Degree	19(19.2%)	25(26.3%)	44(22.7%)		
BSN	58(58.6%)	49(51.6%)	107(55.2%)		
MSN	5(5.1%)	9(9.5%)	14(7.2%)		
Age				7.697	.174
<25	16(16.2%)	8(8.4%)	24(12.4%)		
25 – 30	21(21.2%)	25(26.3%)	46(23.7%)		
31 – 40	29(29.3%)	26(27.4%)	55(28.4%)		
41-50	18(18.2%)	13(13.7%)	31(16.0%)		
≥51	15(15.1%)	23(24.2%)	38(19.6%)		
Gender				.017	.896
Female	88(88.9%)	85(89.5%)	21(10.8%)		
Male	11(11.1%)	10(10.5%0)	173(89.2%)		
Hispanic/Latino Ethnicity				.001	.971
Yes	1(1%)	1(1.1%)	2(1%)		
No	98(99%)	93(98.9%)	191(99%)		
Race				1.948	.583
White	92(93.9%)	84(89.4%)	176(89.6%)		
Black/AfricanAmer.	3(3.1%0)	3(3.2%)	6(3.1%)		
Asian	2(2.0%)	4(4.3%)	6(3.1%)		
Other	1(1.0%)	3(3.2%)	4(2.2%)		
Yrs Nursing Experience				17.174	.028
<1	17(17.2%)	6(6.3%)	23(11.9%)		
1-5	36(36.4%)	37(38.9%)	73(37.6%)		
6-10	9(9.1%)	21(22.1%)	30(15.5%)		
11-15	8(8.1%)	6(4.2%)	14(7.2%)		
≥16	29(29.3%)	25(26.3%)	54(27.8%)		
Yrs on Current Unit				15.866	.003
<1	23(23.2%)	8(8.4%)	31(16.0%)		
1-5	37(37.4%)	46(48.4%)	83(42.8%)		
6-10	10(10.1%)	23(24.2%)	33(17%)		
11-15	15(15.2%)	9(9.5%)	24(12.4%)		
≥16	14(14.1%)	9(9.5%)	23(11.9%)		
Work Status				1.175	.573
Full time	82(82.8%)	83(87.4%)	165(85.1%)		
Part time	4(4%)	4(4.2%)	8(4.1%)		
Casual	13(13.1%)	8(8.4%)	21(10.8%)		

K-W= Kruskal-Wallis; comparison between cardiac and neurology service lines

There was a significant difference between the cardiac and neurology service lines in the distribution of years of nursing experience ($\rho = .028$) and years working on the current nursing unit ($\rho = .003$). The post hoc analysis revealed that, for years of nursing experience, more (74%) respondents with < 1 year experience worked on cardiac units, whereas, only 30% of respondents with 6-10 years of experience worked on a cardiac unit. For the neurology units, 26% of the nurses had <1 year experience working on a neurology unit while 70% of nurses having 6-10 years of experience work on the neurology unit.

4.2 RESPONDENT KNOWLEDGE OF CURRENT PHYSICAL ACTIVITY GUIDELINES: SPECIFIC AIM 1

Figure 1 represents the percent of respondents for both the cardiac and neurology service lines who self-reported knowledge of the current Physical Activity Guidelines for Americans to prevent or treat chronic diseases and other health-related conditions. There was no significant difference in the distribution between cardiac and neurology service line respondents ($\rho = .314$; $Z = -1.006$). Overall, almost half (43.9%) of the respondents rated their self-knowledge of the guidelines at 5 or above on a 7 point Likert Scale indicating that they felt they were more than partially or fully aware of the current recommended guidelines. Approximately one third (32.4%) rated themselves at 3 or below on the 7 point Likert Scale and approximately one-fourth

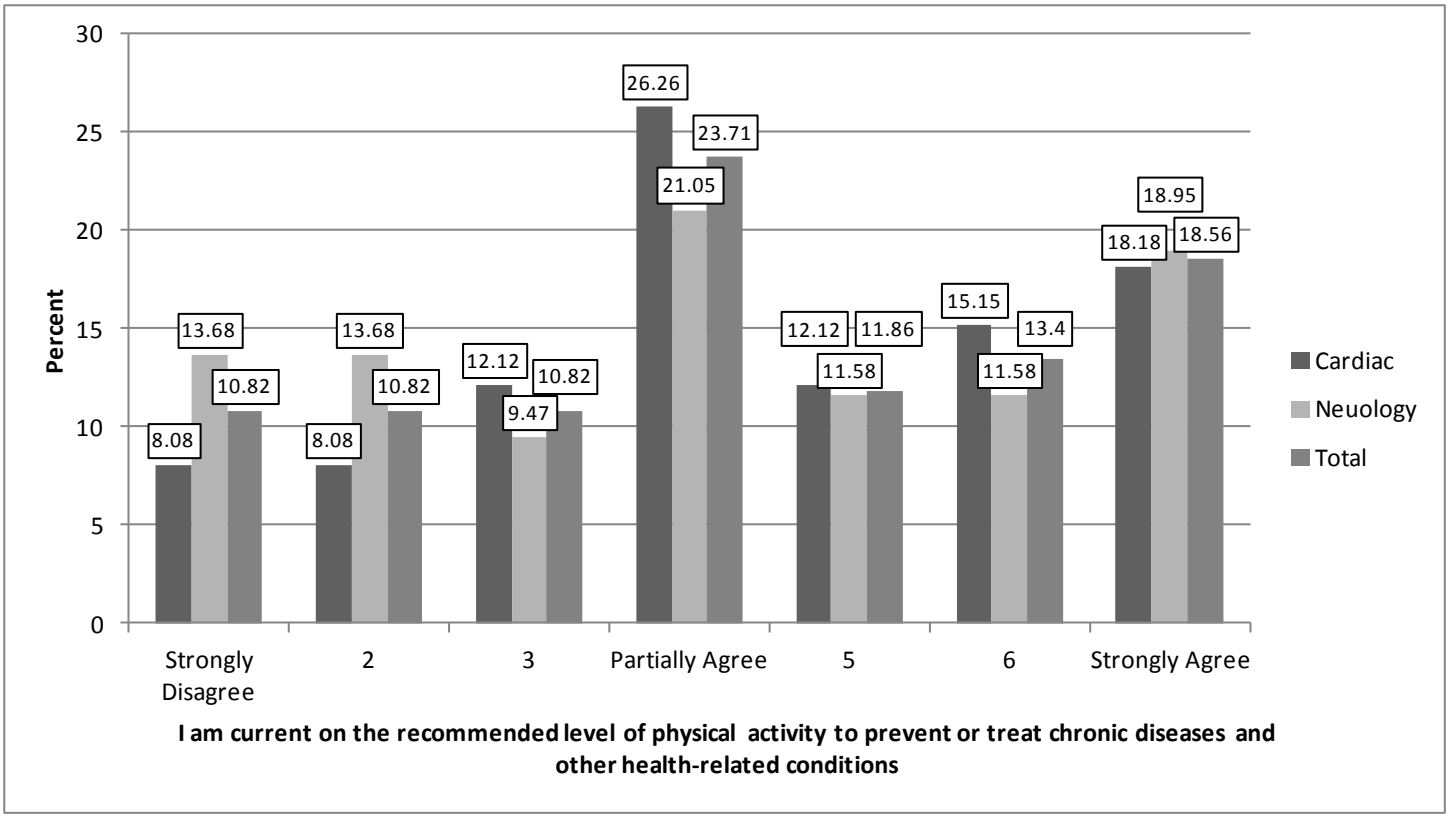

Figure 1: Percent of respondents reporting current knowledge of recommendations for daily activity necessary to prevent or treat chronic disease.

Actual knowledge of the Physical Activity Guidelines for Americans was more specifically assessed by asking the participants to state the number of days per week and the number of minutes per day Americans should engage in physical activity of a moderate intensity to prevent or treat chronic diseases and other health-related conditions. Figures 2 and 3 show the results by service line. In Figure 2, for recommended days per week, overall, half (51%) selected 3 days per week, while 27.3% selected five days per week. There was no significant difference between service lines ($\rho = .973$; $Z = -.033$) for the recommended days per week to engage in aerobic physical activity at a moderate intensity. Of the total number of respondents, 32.5% answered this question consistent with current physical activity guidelines and 67.5% underestimated the recommended days per week to engage in physical activity at a moderate intensity.

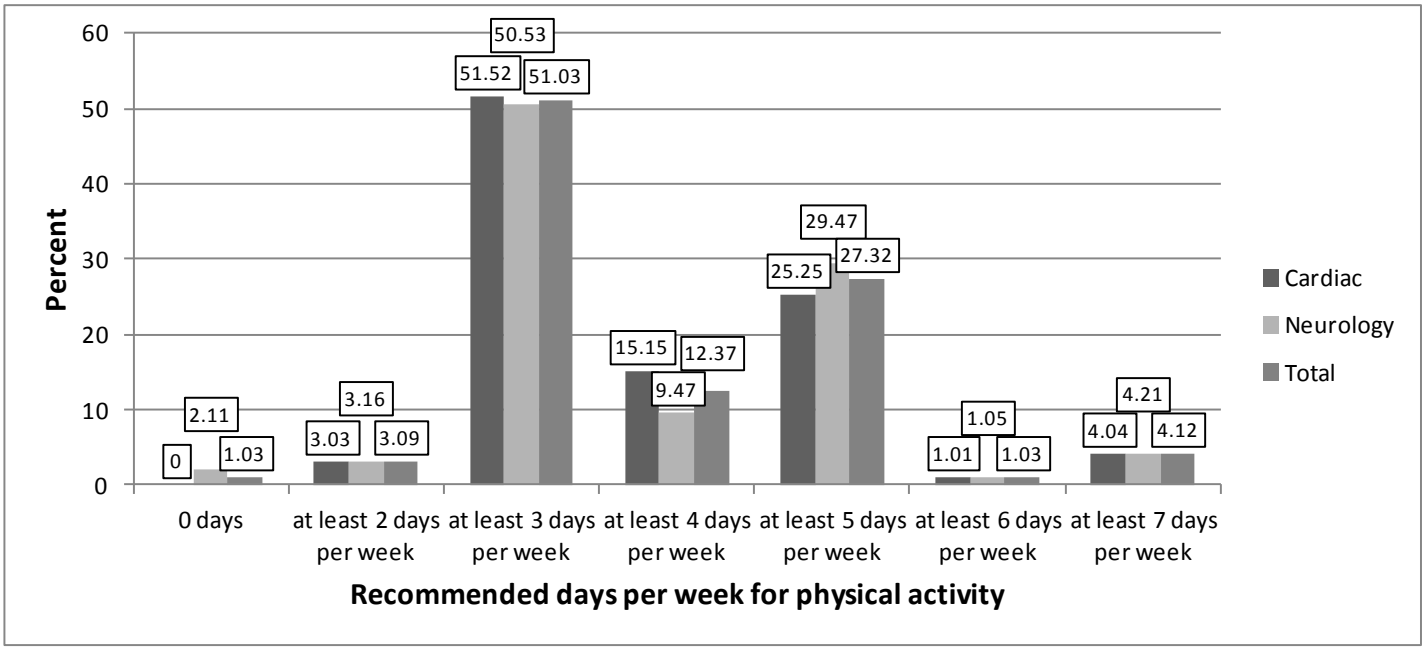

Figure 2: Numbers of days per week respondents cited as necessary to promote and maintain personal health if engaging in aerobic physical activity at moderate intensity. (Note: Current recommendation is at least 5 days)

Figure 3 shows selections of respondents in both service lines regarding current recommendations for the number of minutes per day to engage in aerobic physical activityat at moderate intensity to promote and maintain health. A total of 114 (60.6%) of the respondents reported 30 minutes as the recommended minutes per day Americans should engage in aerobic physical activity, while 42 (22.3%) reported >30 minutes per day as the recommended amount and 32 (17%) reported <30 minutes per day. A significant difference was noted between the cardiac and neurology service lines ($\rho = .033$; $Z = -2.127$), however, it was for the recommendation of exercising for > 30 minutes per day. Of the total number of respondents, 83% answered this question consistent with the current physical activity guidelines and 17% underestimated the recommended minutes per day to engage in physical activity at a moderate intensity.

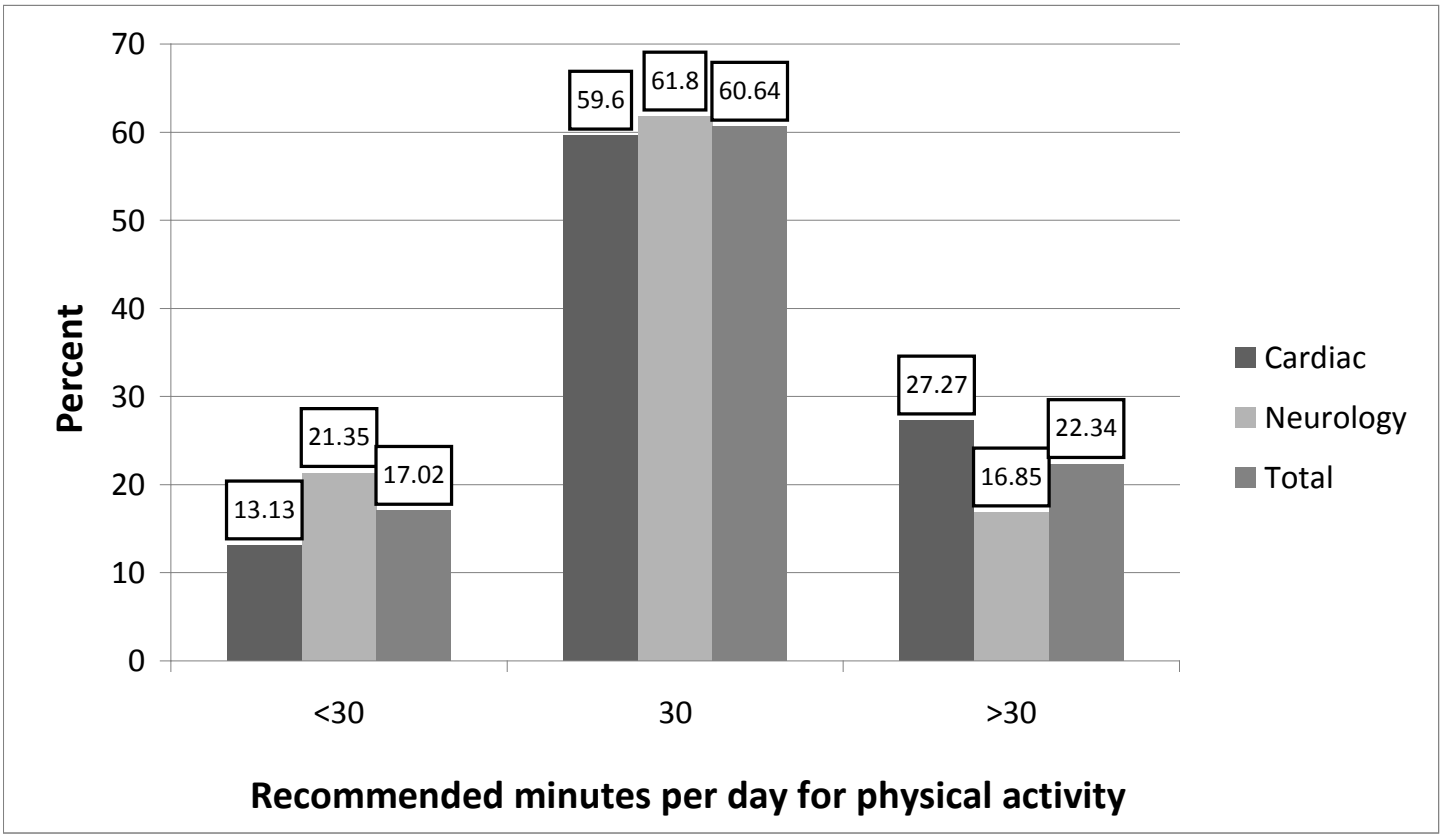

Figure 3: Number of minutes per day respondents cited as necessary to promote and maintain personal health if engaging in aerobic physical activity at moderate intensity (Note: Current recommendation is at least 30 minutes)

4.3 RANK OF IMP0RTANCE OF PHYSICAL ACTIVITY COUNSELING AS A PATIENT CARE ACTIVITY: SPECIFIC AIM 2

Respondents were asked to rank (1=most important; 10=least important) the importance of physical activity counseling as a patient care activity compared to documentation, passing medications, checking physician's orders, performing treatments, respiratory/mouth care, patient assessment, giving discharge instructions, explaining daily plan of care, and patient/family teaching. A summary of the ranking of importance of the ten variables by service line is shown

in Appendix F. Table 3 summarizes the mean ranking of each variable for both service lines and overall ranking. Over half of the respondents ranked physical activity counseling as least important and 85.9% ranked physical activity counseling as 8 or lower. Only 1% of respondents ranked physical activity counseling as the most important patient care activity. Patient assessment was ranked the most important for total respondents and both service lines. Passing medications and checking physicians orders were ranked 2nd and 3rd as most important for total respondents and both service lines. Counseling patients about physical activity was ranked as the least important by the nurses regardless of service line, with overall mean ranking of importance as 9.03 on a scale of 1 (most important) to 10 (least important).

Table 3: Rank (mean±standard deviation) of importance for ten patient care activities by acute care nurses (1= most important; 10 = least important)

Variable	Cardiac Service Line Mean (standard deviation)	Neurology Service Line Mean (standard deviation)	Combined Cardiac and Neurology Service Lines Mean (standard deviation)
Patient assessment	1.63 ±1.42	1.60 ±1.66	1.61 ±1.53
Passing medications	2.62 ±1.39	3.18 ±1.74	2.90 ±1.59
Checking physician orders	3.91 ±2.02	3.44 ±1.76	3.68 ±1.91
Performing treatments	4.29 ±2.05	4.13 ±1.74	4.21 ±1.90
Explaining daily plan of care	5.82 ±2.08	5.74 ±2.24	5.79 ±2.16
Documentation	6.09 ±2.28	6.13 ±2.49	6.11 ±2.38
Respiratory/mouth care	6.55 ±2.14	5.98 ±2.25	6.27 ±2.21
Patient/family teaching	6.56 ±1.92	6.77 ±1.90	6.66 ±1.91
Discharge instructions	8.35 ±1.77	8.19 ±1.98	8.27 ±1.87
Counseling about physical activity	9.03 ±1.49	9.03 ±1.63	9.03 ±1.56

Respondents were also asked to identify barriers to counseling patients on physical activity. Table 4 summarizes the identified barriers with lack of time for physical activity counseling reported as the most common barrier to counseling patients on physical activity. This finding was consistent for both the cardiac and neurology service lines. Although lack of time is noted as a barrier, when queried about how much time was spent per day on patient counseling and patient counseling about physical activity in particular, the average amount of time was 90 minutes and 24 minutes respectively. This represents the total amount of time that the nurse engages in this education counseling which then is divided between all patients cared for that

day. Nurse to patient ratios on the units surveyed are typically 1:4. Thus, with the above average minutes, the minutes per day per patient would be 22.5 with 6 minutes dedicated to physical activity counseling per patient. No significance was noted between service lines. Table 5 summarizes the data for patient education counseling and counseling about physical activity.

Table 4: Identified barriers to physical activity counseling by acute care nurses per service line

Variable	Cardiac Service Line Number reporting barrier (% of respondents)	Neurology Service Line Number reporting barrier (% of respondents)	Combined Cardiac and Neurology Service Lines Number reporting Barrier (% of respondents)
Lack of time for physical activity counseling	49 (49.5)	44 (46.3)	93 (47.9)
Knowledge deficit of physical activity guidelines	41 (41.4)	37 (38.9)	78 (40.2)
Patient not receptive to physical activity counseling	34 (34.2)	46 (48.4)	80 (41.3)
Knowledge deficit of how to counsel about physical activity	26 (26.3)	26 (27.4)	52 (26.9)
Other (see Appendix G)	20 (20.2)	20 (20.1)	40 (20.15)

Table 5: Identified minutes of patient education counseling and minutes of patient education counseling about physical activity per day by acute care nurses by service line

Variable	Cardiac Service Line Mean (standard deviation)	Neurology Service Line Mean (standard deviation)	Combined Neurology and Service Lines Mean (standard deviation)	t (ρ-value)
Minutes of patient education counseling	**97.06 ±131.33**	**83.35 ±93.79**	**90.42 ±114.60**	**.892 .374**
Minutes of patient education counseling about physical activity	**30.67 ±64.5**	**18.6 ±28.05**	**24.83 ±50.52**	**1.69 .093**

Other identified barriers to counseling patients about physical activity are summarized in Appendix G per service line. The most frequently noted as other barriers were low priority of physical activity (n = 6) and patient diagnosis (n = 6). Additional important barriers to physical activity counseling noted were physical limitations or restrictions of the patients (n=4) and the acuity of the patient (n=1).

4.4 RANK OF IMPORTANCE OF PHYSICAL ACTIVITY AS A LIFESTYLE HEALTH-RELATED BEHAVIOR: SPECIFIC AIM 3

Respondents were asked to rank (1=most important; 10=least important) physical activity as a lifestyle health-related behavior as compared to smoking cessation, nutrition education, weight

management, moderate ETOH ingestion, medical compliance, immunizations, adequate sleep, stress management, and mental/emotional health. Mean ranks for the 10 lifestyle health-related behaviors are summarized in Table 6. The actual numbers for each rank for the 10 lifestyle health-related behaviors are summarized in Appendix H. Respondents from the cardiac service line ranked physical acitivity 4th and respondents from the neurology service line ranked physical activity 5th. Overall respondents ranked physical activity 5th as a lifestyle health-related behavior behind medical compliance, nutrition education, smoking cessation, and weight management. The rankings for these ten lifestyle health-related behaviors are summarized in Table 6, with additional data presented in Appendix H.

Table 6: Rank (mean±standard deviation) of importance for 10 lifestyle health-related behaviors by acute care nurses (1= most important; 10 = least important)

Variable	Cardiac Service Line Mean (standard deviation)	Neurology Service Line Mean (standard deviations)	Combined Cardiac and Neurology Service Lines Mean (standard deviation)
Medical Compliance	1.99 ±1.91	1.90 ±1.66	1.95 ±1.79
Nutrition Education	3.56 ±1.91	4.22 ±2.32	3.88 ±2.14
Smoking Cessation	4.20 ±2.86	3.65 ±2.37	3.93 ±2.64
Weight Management	5.38 ±2.27	4.80 ±2.24	5.09 ±2.27
Physical Activity	5.06 ±2.47	5.54 ±2.73	5.29 ±2.60
Stress Management	5.85 ±2.24	5.96 ±2.46	5.90 ±2.35
Mental/Emotional Health	6.31 ±2.67	6.28 ±2.73	6.29 ±2.69
Adequate Sleep	6.48 ±2.35	6.60 ±2.43	6.54 ±2.39
Moderate ETOH Ingestion	7.82 ±2.03	7.11 ±2.60	7.47 ±2.35
Immunizations	7.97 ±2.23	7.26 ±2.82	7.62 ±2.55

4.5 SELF-REPORTED CONFIDENCE TO COUNSEL PATIENTS ON PHYSICAL ACTIVITY : SPECIFIC AIM 4

Respondents were also asked to self-report their confidence when counseling patients about physical activity. The majority (51%) felt some degree of confidence to counsel patients about physical activity with 14.1% being very confident. Those having partial confidence to counsel

patients about physical activity comprised 31.3% of the respondents. Figure 4 shows the percentage of respondents from both service lines for each of the 7 points of the Likert Scale (1 = strongly disagree and 7= strongly agree) for self-reported confidence of the nurses to counsel patients on physical activity.

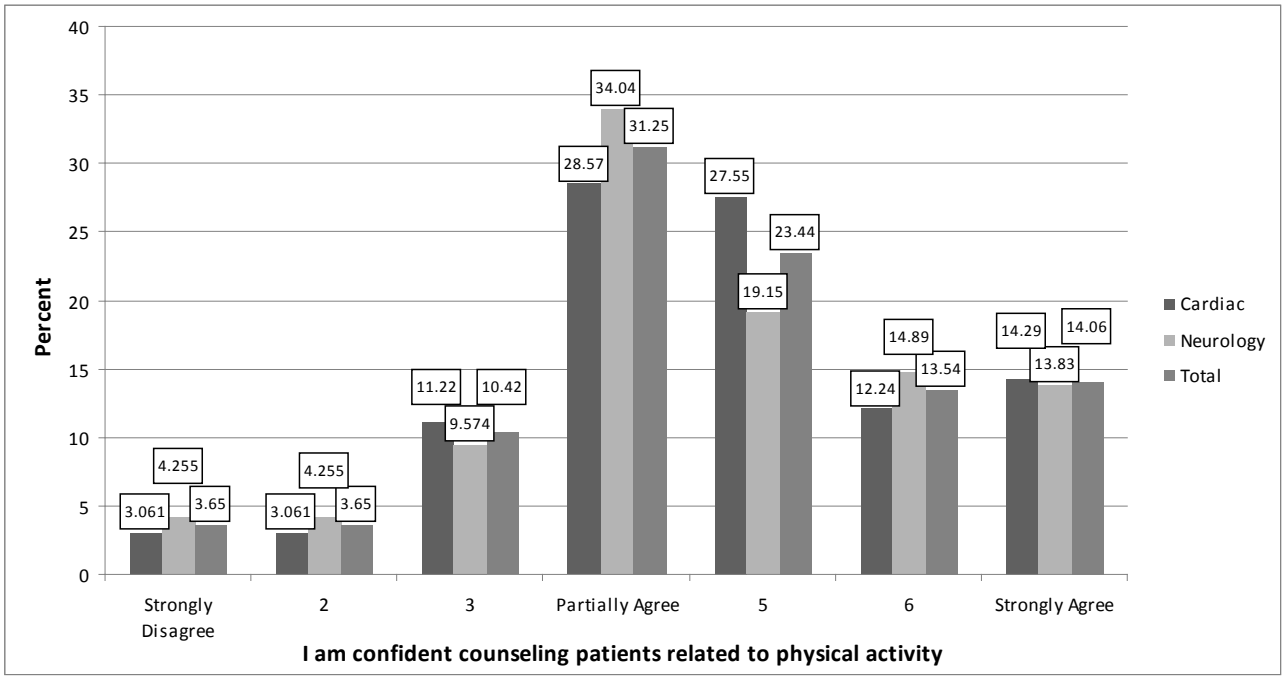

Figure 4: Reported confidence of respondents to counsel patients on physical activity

4.6 INFLUENCE OF ACUTE CARE NURSE'S LEVEL OF TRAINING ON KNOWLEDGE OF CURRENT PHYSICAL ACTIVITY GUIDELINES, RANK OF PHYSICAL ACTIVITY COUNSELING AS A PATIENT CARE ACTIVITY, RANK OF PHYSICAL ACTIVITY AS A LIFESTYLE HEALTH-RELATED BEHAVIOR AND CONFIDENCE TO COUNSEL PATIENTS ABOUT PHYSICAL ACTIVITY: EXPLORATORY AIM 1

Table 7 summarizes the data regarding the relationship between level of training and self-reported knowledge of physical activity guidelines, rank of physical activity counseling as a patient care activity, rank of physical activity as a lifestyle health-related activity, and confidence to counsel patients about physical activity. When these relationships were examined, the level of the acute care nurse's training was significant (ρ=.05) for the self-reported knowledge of current guidelines and was significant (ρ= .025) for knowledge of the recommended number of minutes per day to engage in aerobic exercise at a moderate level. With Bonferroni correction, a Mann-Whitney post-hoc analysis was done. There were no significant differences between any level of education group for knowledge of the current guidelines for physical activity. For the recommended number of minutes per day to engage in aerobic exercise, the difference was significant with a ρ=.008 (post-hoc analysis with ρ = .05 for significance with six comparisons) between the baccalaureate and master's degree groups with the baccalaureate respondents more likely to be correct.

Table 7: Influence of highest degree of nursing training of acute care nurses on self-reported knowledge of current physical activity guidelines, rank of importance of physical activity counseling, rank of physical activity as a lifestyle health-related activity

Variable	Highest Level of Nurses' Training	Cardiac Service Line X^2 K-W (ρ-value)	Neurology Service Line X^2 K-W (ρ-value)	Combined Cardiac and Neurology Service Lines Mean Rank	Combined Cardiac and Neurology Service Lines X^2 K-W (ρ-value)
Knowledge of Current Guidelines:		2.561 (.464)	5.506 (.138)		7.76 (.050)
	Diploma			84.52	
	Associates Degree			82.40	
	Baccalaureate Degree			106.25	
	Master's Degree			105.00	
Recommended Days Per Week		7.836 (.050)	2.595 (.458)		4.176 (.243)
	Diploma			93.59	
	Associates Degree			85.15	
	Baccalaureate Degree			102.28	
	Master's Degree			107.93	
Recommended Minutes Per Day		2.190 (.534)	6.960 (.073)		9.345 (.025)
	Diploma			97.07	
	Associates Degree			83.63	
	Baccalaureate Degree			102.44	
	Master's Degree			67.82	
Rank of Physical Activity Counseling		2.087 (.555)	4.633 (.201)		3.497 (.321)
	Diploma			102.86	
	Associates Degree			103.01	
	Baccalaureate Degree			90.01	
	Master's Degree			107.71	
Rank of Physical Activity as a Lifestyle Health-Related Behavior		2.626 (.453)	7.762 (.051)		2.981 (.395)
	Diploma			99.27	
	Associates Degree			106.60	
	Baccalaureate Degree			91.18	
	Master's Degree			85.85	
Self-Reported Confidence to Counsel About Physical Activity		1.287 (.732)	4.609 (.203)		4.779 (.189)
	Diploma			91.78	
	Associates Degree			84.03	
	Baccalaureate Degree			100.56	
	Master's Degree			115.04	

4.7 INFLUENCE OF AGE ON KNOWLEDGE OF CURRENT PHYSICAL ACTIVITY GUIDELINES, RANK OF PHYSICAL ACTIVITY AS A PATIENT CARE ACTIVITY, RANK OF PHYSICAL ACTIVITY AS A LIFESTYLE HEALTH-RELATED BEHAVIOR, AND CONFIDENCE TO COUNSEL PATIENT ABOUT PHYSICAL ACTIVITY: EXPLORATORY AIM 2

Table 8 summarizes the data regarding the relationship between age and self-reported knowledge of physical activity guidelines, rank of physical activity counseling as a patient care activity, rank of physical activity as a lifestyle health-related activity, and confidence to counsel patients about physical activity. A significant relationship with age was found for the number of recommended minutes per day to engage in aerobic exercise at a moderate intensity ($\rho = .048$), but not for the other areas tested. A Bonferroni correction Mann-Whitney post-hoc test was done which revealed a significant difference between the <25 to 41-50 and <25 to >50 age groups in the neurology service line ($\rho = .001$); younger nurses were more current than the older groups in regard to this information.

Table 8: Influence of age of acute care nurses on self-reported knowledge of current physical activity guidelines, rank of importance of physical activity counseling, rank of physical activity as a lifestyle health-related activity, and self-reported confidence

Variable	Age	Cardiac Service Line X^2 K-W (ρ-value)	Neurology Service Line X^2 K-W (ρ-value)	Combined Cardiac and Neurology Service Lines Mean Rank	Combined Cardiac and Neurology Service Lines X^2 K-W (ρ-value)
Knowledge of Current Guidelines		12.306 (.015)	.382 (.984)		6.713 (.152)
	<25			119.48	
	25-30			103.33	
	31-40			95.27	
	41-50			84.52	
	>50			90.38	
Recommended Days Per Week		3.650 (.455)	7.355 (.118)		5.235 (.264)
	<25			116.35	
	25-30			90.50	
	31-40			98.58	
	41-50			101.50	
	>50			89.24	
Recommended Minutes Per Day		5.749 (.219)	10.741 (.030)		9.572 (.048)
	<25			**112.88***	
	25-30			105.91	
	31-40			87.48	
	41-50			**88.07***	
	>50			**84.10***	
Rank of Physical Activity Counseling		9.632 (.047)	4.763 (.313)		7.117 (.130)
	<25			105.37	
	25-30			93.79	
	31-40			95.32	
	41-50			111.45	
	>50			80.57	
Rank of Physical Activity as a Lifestyle Health-Related Behavior		2.931 (.569)	7.495 (.112)		3.394 (.494)
	<25			82.75	
	25-30			103.09	
	31-40			101.26	
	41-50			88.50	
	>50			92.24	
Self-Reported Confidence to Counsel About Physical Activity		2.291 (.682)	4.843 (.304)		3.347 (.502)
	<25			99.54	
	25-30			95.76	
	31-40			89.29	
	41-50			92.53	
	>50			109.47	

***ρ=.001 between <25 and 41-50 ; ρ=.001 between <25 and >50**

4.8 RELATIONSHIP OF PERSONAL PHYSICAL ACTIVITY BEHAVIOR ON KNOWLEDGE OF CURRENT PHYSICAL ACTIVITY GUIDELINES, RANK OF PHYSICAL ACTIVITY AS A PATIENT CARE ACTIVITY, RANK OF IMPORTANCE OF PHYSICAL ACTIVITY AS A LIFESTYLE HEALTH-RELATED ACITIVITY, AND CONFIDENCE TO COUNSEL PATIENTS ABOUT PHYSICAL ACTIVITY: EXPLORATORY AIM 3

Table 9 summarizes the data regarding the relationship between personal physical activity behavior and self-reported knowledge of physical activity guidelines, rank of physical activity counseling as a patient care activity, rank of physical activity as a lifestyle health-related activity, and confidence to counsel patients about physical activity. Respondents who engaged in physical activity (n=158; 81.4%) were significantly ($p<.0004$) more likely to report they had current knowledge of the physical activity guidelines. A Bonferroni correction Mann-Whitney post-hoc test was done which showed a significant relationship for both the cardiac and neurology service lines ($\rho = .001$; $Z= -3.472$). Respondents who exercised were more likely to report they were current in their knowledge of the physical activity guidelines compared to respondents who did not exercise. No other significant relationships were found for any other variable examined.

Table 9: Influence of personal physical activity on acute care nurses on self-reported knowledge of current physical activity guidelines, rank of importance of physical activity counseling, rank of physical activity as a lifestyle health-related activity, and self-reported confidence to counsel patients about physical activity

Variable	Personal Physical Activity	Cardiac Service Line Z M-W (ρ-value)	Neurology Service Line Z M-W (ρ-value)	Combined Cardiac and Neurology Service Lines Mean Rank	Combined Cardiac and Neurology Service Lines Z M-W (ρ-value)
Knowledge of Current Guidelines:		-3.423 (.001)	-3.260 (.001)		-4.691 (<.0004)
	Yes (n =158)			106.40	
	No (n = 36)			58.43	
Recommended Days Per Week					-1.340 (.180)
	\Yes (n =158)	-.866	-.675	99.87	
	No (n = 36)	(.386)	(.500)	87.10	
Recommended Minutes Per Day					-.870 (.070)
	Yes (n =158)	-.634	-1.300	95.92	
	No (n = 36)	(.526)	(.194)	88.09	
Rank of Physical Activity Counseling					-.320 (.749)
	Yes (n =158)	-.526	-.048	95.44	
	No (n = 36)	(.599)	(.961)	98.43	
Rank of Physical Activity as a Lifestyle Health-Related Behavior					-1.750 (.080)
	Yes (n =158)	-.367	-2.286	92.21	
	No (n = 36)	(.714)	(.022)	110.09	
Self-Reported Confidence to Counsel About Physical Activity					-1.814 (.070)
	Yes (n =158)	-.890	-1.726	99.90	
	No (n = 36)	(.374)	(084)	81.75	

Respondents who did not exercise (n=36; 18.6%) were asked to identify barriers to exercise. The identified barriers are listed in Table 10. Lack of time and lack of motivation were the most commonly identified reasons for not engaging in aerobic physical activity.

Table 10: Identified Barriers to Exercise by Respondents who do not engage in physical activity (n=36)*

Barrier	Cardiac Service Line Frequency	Neurology Service Line Frequency	Combined cardiac and Neurology Service Lines Frequency
Lack of Motivation	13	12	25
Lack of Time	12	9	21
Exercise is inconvenient	3	1	4
Unable to exercise due to health limitation	1	3	4
Other	5	1	6
Too tired	2	1	3
Child care issue	1		1
Gym membership not in budget	1		1
Pregnancy	1		1

*Some respondents listed multiple barriers

4.9 RELATIONSHIP OF YEARS OF NURSING EXPERIENCE ON KNOWLEDGE OF CURRENT PHYSICAL ACTIVITY GUIDELINES, RANK OF PHYSICAL ACTIVITY AS A PATIENT CARE ACTIVITY, RANK OF PHYSICAL ACTIVITY AS A LIFESTYLE HEALTH-RELATED BEHAVIOR, AND CONFIDENCE TO COUNSEL PATIENTS ABOUT PHYSICAL ACTIVITY: EXPLORATORY AIM 4

Table 11 summarizes the data regarding the relationship between years of nursing experience and self-reported knowledge of physical activity guidelines, rank of physical activity counseling

as a patient care activity, rank of physical activity as a lifestyle health-related activity, and confidence to counsel patients about physical activity. There was no significant difference by number of years of experience on outcomes related to knowledge of current physical activity guidelines, rank of physical activity counseling as a patient care activity, rank of physical activity as a lifestyle health-related activity, or confidence to counsel patients about physical activity.

Table 11: Influence of years of experience on acute care nurses on self-reported knowledge of current physical activity guidelines, rank of importance of physical activity counseling, rank of physical activity as a lifestyle health-related activity, and self-reported confidence to counsel patients about physical activity

Variable	Years of Experience	Cardiac Service Line X^2 K-W (ρ-value)	Neurology Service Line X^2 K-W (ρ-value)	Combined Cardiac and Neurology Service Lines Mean Rank	Combined Cardiac and Neurology Service Lines X^2 K-W (ρ-value)
Knowledge of Current Guidelines:		2.910 (.573)	1.463 (.833)		1.655 (.799)
	<1			93.85	
	1-5			103.06	
	6-10			91.70	
	11-15			103.50	
	>15			93.20	
Recommended Days Per Week		1.788 (.775)	2.307 (.649)		1.610 (.807)
	<1			90.80	
	1-5			101.68	
	6-10			100.63	
	11-15			87.14	
	>15			95.65	
Recommended Minutes Per Day		.122 (.998)	6.420 (.170)		3.762 (.439)
	<1			94.20	
	1-5			102.33	
	6-10			90.19	
	11-15			95.79	
	>15			86.15	
Rank of Physical Activity Counseling		3.251 (.517)	5.116 (.276)		4.736 (.315)
	<1			111.36	
	1-5			98.77	
	6-10			81.95	
	11-15			90.43	
	>15			95.22	
Rank of Physical Activity as a Lifestyle Health-Related Behavior		4.677 (.322)	5.891 (.207)		3.435 (.485)
	<1			99.00	
	1-5			94.05	
	6-10			110.62	
	11-15			85.54	
	>15			89.97	
Self-Reported Confidence to Counsel About Physical Activity		.825 (.935)	3.284 (.512)		.747 (.945)
	<1			98.00	
	1-5			94.24	
	6-10			100.05	
	11-15			87.96	
	>15			00.16	

5.0 DISCUSSION

5.1 INTRODUCTION

The purpose of this study was to examine acute care nurses': 1) knowledge of current physical activity guidelines, 2) rank of importance assigned to counseling patients about physical activity as a patient care activity, 3) rank of importance assigned to physical activity as a lifestyle health-related activity, 4) confidence in counseling patients about physical activity. This information would provide valuable information regarding the ability of acute care nurses as a resource to deliver education about physical activity to hospitalized patients. Exploratory aims were also designed to explore the influence of selected characteristics i.e. highest level of education, age, personal physical activity, and years of experience on these outcomes.

5.2 RESPONSE RATE

Of eligible respondents, 74% returned usable surveys. Recommended response rates in the literature are variable reporting ranges from 15% to 89%. [112] A survey study conducted at this facility using a similar sample base obtained a response rate of 41%. [111] Thus, 74% response rate supports a robust response. Approximately equal percentages of surveys were returned from the two service lines (51%cardiac; 49% neurology).

5.3 ACUTE CARE NURSES' KNOWLEDGE OF THE CURRENT PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS

The survey queried acute care nurses on their knowledge of the current physical activity guidelines and the number of days per week and minutes per day that are recommended to engage in aerobic physical activity at a moderate intensity. Responses indicated that a substantial number of acute care nurses had incorrect knowledge and that this deficiency was not recognized by many of these individuals.

Before accurate patient education on physical activity guidelines can begin, one must insure that the educator possesses the correct knowledge. Slightly less than half of the acute care nurses felt they had accurate knowledge of the current physical activity guidelines and the remaining half judged they had limited knowledge. Consistent with this finding, approximately one-third (32.5%) of the acute care nurses stated 5 days or more per week as the number of days that Americans should engage in aerobic physical activity at a moderate intensity which is consistent with the recommended guidelines. The remaining acute care nurses (67.5%) underestimated the recommended number of days per week to engage in physical activity at a moderate intensity. Acute care nurses were more likely to be accurate when identifying the recommended time per day to engage in aerobic physical activity. Of acute care nurses, 82.9% identified 30 minutes or more per day as the recommendation to engage in aerobic physical activity which is consistent with the current guidelines for physical activity. There was a

significant difference between the cardiac and neurology service lines for minutes per day; this difference was for a response of more than 30 minutes per day.

These results indicate that some education is necessary to assure that the respondents are knowledgeable about the current guidelines. There is a lack of literature examining nurses' knowledge about the physical activity guidelines. A national study by Mosca et al[96] surveyed primary care physicians, cardiologists, obstetricians and gynecologists about their awareness and adherence to cardiovascular prevention guidelines; their self-reported adherence ranged from 9-12.7%.

Marcus, et al provided education for physicians about counseling about physical activity for prevention in an office setting.[17] The Physician–based Assessment and Counseling for Exercise (PACE) study in the 1990's[16] included physicians who were interested in physical activity counseling. This study reported significant findings for an increase in participants physical activity which fell below the recommended guidelines. Health promotion was identified by the American Nurses' Association in 1995 as a fundamental concept for nursing practice.[113] As early as the 1980's, an evolving shift from disease care to health promotion in nursing curriculums occurred.[113] No significant difference between levels of education of the acute care nurses was found for knowledge of physical activity guidelines. If it is true that health promotion occurs in the nursing curricula, a question regarding the extent of education about physical activity guidelines can be raised. The nurse respondents in this study had limited knowledge consistent with the recommended physical activity guidelines. It may be that the curricula have not evolved to a well-defined body of knowledge i.e. physical activity guidelines to include in a health promotion course.

An interesting finding was that nurses who engaged in physical activity themselves were significantly more likely to have current knowledge of physical activity recommendations. With over 80% of acute care nurses reporting they engage regularly in physical activity, there may be a positive trend for increased health promotion regarding this behavior in patient counseling. The Nurse's Health Study has been able to follow nurses over more than 20 years and follow the relationship between use of hormones and exercise. While it provides information about nurses' health, it does not add to the body of knowledge about nurses' knowledge of physical activity guidelines.[114] Abramson et al[115] noted in a national survey of physicians that physicians who exercised regularly were more likely to counsel their patients on the benefit of physical activity. No similar study of nurses exists in the literature.

5.4 ACUTE CARE NURSES PRIORITIZATION OF COUNSELING PATIENTS ON PHYSICAL ACTIVITY COMPARED TO OTHER PATIENT CARE RESPONSIBILITIES

The survey queried acute care nurses on the rank they gave to physical activity counseling as a patient care activity compared to other patient care activities. The majority of respondents from both service lines ranked physical activity as 9th or 10th (mean = 9.03) from a list of 10 patient care activities. This result is consistent with studies in the literature. Williams[116] notes that nurses prioritize care to the reason the patient was admitted to the hospital, focusing on interactions to meet the physical needs of the patient first. When time was limited, physical needs took priority over other psychosocial needs. Jinks and Hope[117] conducted an observational

study in which nurses were observed for frequency of patient care activities. The smallest number of observed activities was education and counseling, comprising 2% of all observed activities.

5.5 IDENTIFIED BARRIERS TO PATIENT COUNSELING ON PHYSICAL ACTIVITY

Acute care nurses were asked to identify barriers to educating patients about physical activities. Almost half of acute care nurses from both service lines identified lack of time for physical activity counseling as the most prevalent barrier. This is consistent with the study by Williams[116] noting that when time was limited physical needs took priority, with education and counseling receiving the least amount of time. Limitation of time may be partially explained by Hendrickson et al[118] who explored the distribution of nursing activities. They found that nurses spent 31% of their time for direct patient care, 45% on indirect patient care activities i.e. charting, and 10% on non-clinical activities i.e. telephone calls. In a study by Chang[119] nursing tasks were identified as management, patient care and non-nursing duties. Nurses were found to spend time in non-nursing tasks including housekeeping and clerical-related tasks. It is possible that redesigning the work and role of nurses in the acute care setting can increase the available time for nurses to engage in patient care activities, including education and counseling.

Although lack of time was identified as a barrier, nurses in this study reported spending an average of 90 minutes per day educating patients and an average of 24 minutes per day educating patients specifically about physical activity. No significant difference was found

between the service lines regarding actual time spent counseling patients in general, and specifically about physical activity, indicating nurses from both service lines place equal importance on patient counseling. This reinforces that patient teaching continues to be important with earlier discharges, more complicated medical regimens, home treatments, and lifestyle modifications.[120] However, knowledge deficit about the physical activity guidelines was identified as a barrier by approximately 40% of acute care nurses, which reinforces the need for education of nurses about the physical activity guidelines. As noted above, health promotion has evolved in nursing curricula, but may need to include more emphasis on physical activity guidelines.

Approximately 25% of acute care nurses identified a knowledge deficit of how to counsel patients about physical activity, which may also be addressed with education. While nursing literature includes patient teaching as a role of nurses, it may be argued that nurses are not adequately prepared to teach or counsel patients. There are few current studies addressing this issue. A study by Turner et al[120] explored nurses' perceptions about their role as a patient educator. The main concerns brought forth included: the ability required for patient education (assessment of patient's needs, readiness to learn, how to evaluate, and sound knowledge base); barriers to a teaching moment (heavy workload, teaching being circumscribed by events in the course of the day); and documentation of teaching activities and outcomes. As noted by Benson and Latter[121] skills necessary to counsel patients must be integrated into nursing curricula to see the transfer of concepts, such as health promotion, into practice. Thus, preparation for the role of patient teaching and counseling needs to be an emphasis in nursing curricula.

5.6 ACUTE CARE NURSES PRIORITIZATION OF PHYSICAL ACTIVITY BEHAVIOR COMPARED TO OTHER LIFESTYLE HEALTH-RELATED BEHAVIORS

Acute care nurses were asked to rank 10 lifestyle health-related behaviors: physical activity, smoking cessation, nutrition education, weight management, moderate ETOH ingestion, medical compliance, immunizations, adequate sleep, stress management, and mental/emotional health. The overall mean rank of physical activity was 5th most important. A possibility exists that this ranking may have been influenced by health promotion being addressed in the nursing curricula. No significant differences were noted between service lines, nor for the additional exploratory aims (years of experience, level of training, age or personal physical activity) on the rank assigned to the various lifestyle health related behaviors. No comparable study was found in which nurses were asked to prioritize lifestyle health-related activities. Much research has been focused on identifying modifiable risk factors which relate to health-related behaviors.[122] Over the past ten years, evidence-based nursing practice has evolved and been integrated into nursing curricula.[123] Existing evidence of benefits of physical activity may have influenced the rank assigned to physical activity by acute care nurses.[124]

5.7 SELF-EFFICACY OF ACUTE CARE NURSES TO COUNSEL PATIENTS RELATED TO PHYSICAL ACTIVITY

The majority of acute care nurses felt partially to fully confident in their ability to counsel patients about physical activity with approximately 20% citing less confidence. Burke et al[125] note that lack of confidence in how to counsel patients, knowledge of what to teach, and behavioral theory all affect overall confidence in patient education. The results from this study indicate that the majority of the nurses have this confidence which indicates that they possess the necessary skill to translate the knowledge of physical activity guidelines into practice.

An interesting and logical finding was that nurses who engage in physical activity themselves were significantly more likely to have current knowledge of physical activity recommendations. With over 80% of acute care nurses reporting they engage regularly in physical activity, there may be a positive trend to increased patient counseling and health promotion regarding physical activity, if nurses follow the same trend as physicians identified by Abramson et al [115] which showed increased counseling about physical activity related to increased personal physical activity of physicians. Thus, interventions to increase physical activity in nurses may result in increased physical activity counseling by nurses to their patients.

5.8 LIMITATIONS AND FUTURE DIRECTIONS

The following limitations and recommendations should be considered for future directions of research:

1. Two service lines were selected for survey distribution. The selected service lines represented clinical units that admitted patients with a primary cardiac or neurological diagnosis. Both conditions are characterized by risk factors that can be modified by adhering to physical activity guidelines.[28,34-36,44, 50,52] Thus, both service lines were judged likely to include acute care nurses whose knowledge base should include current knowledge of recommended activity guidelines. Results, therefore, can only be generalized to other cardiac and neurology nurses. A recommendation for future research would be to repeat the study with a wider variety of patient populations to increase the generalization of results.
2. This study was conducted at a large academic medical center in a metropolitan area. Thus, the results of this study are not generalizable to nurses in community hospitals or nurses in hospitals located in rural locations. This should be a focus of future research to determine if the findings would be consistent or different than what was observed in this study.
3. Information related to the type and amount of patient counseling that was done was based on self-report, which may result in an error in the data reported. Future studies should consider alternative methods for evaluation that could involve objective assessment of the measures or validation of the questionnaire used in this study.
4. Physical activity of the nurses was based on self-report. Again, future studies should be consider use of an objective measure of physical activity when examining the physical activity of nurses.
5. This study collected data in a cross-sectional manner at one time point. This provides limited information about the change in counseling practices of nurses over time. Thus,

future studies should consider a prospective study design to evaluate these research questions.

6. This study did not gather information on the training that nurses received in school or as part of continuing education with regard to physical activity counseling. Future studies should consider evaluating whether nurses who are trained with an increased emphasis on physical activity counseling provide different information about physical activity or counsel more on physical activity when compared to nurses trained with less of an emphasis on physical activity.

5.9 CONCLUSION

It is established in the literature that physical activity is important for management and prevention of chronic disease. Chronic disease is contributes to 70% of all deaths and is responsible for more than 75% of health care expenditures. The three leading chronic diseases are heart disease and stroke, cancer, and diabetes. These chronic diseases can all be directly affected by increasing physical activity.

The current Physical Activity Guidelines for Americans recommend engaging in physical activity of moderate intensity for at least 5 days a week for at least 30 minutes. Patients must be taught the importance and benefits of engaging in regular physical activity guidelines according to the current recommendations. This education has occurred in primary care and community settings. Physician counseling has been modestly effective and short lived according to current literature. Nurses have had some success counseling patients in

outpatient and community settings. Historically, nurses' roles in the acute care setting include patient teaching. While outpatient visits range from an average of 18-21 minutes, average lengths of stay in the hospital are 4.8 days. Nurses spend between 20% and 31% of their time in actual patient care activities, during which patient counseling could occur. Therefore, acute care nurses may be in an optimal position to counsel patients on healthy lifestyle behaviors, particularly physical activity.

No studies exist in the literature to describe the knowledge of acute care nurses about the current physical activity guidelines, if acute care nurses engage in physical activity counseling, how they prioritize physical activity counseling, prioritize physical activity as a healthy lifestyle behavior, or if they are confident counseling patients about physical activity. This study was designed to examine those aims.

Results showed that nurses have some limited knowledge of the current physical activity guidelines with 32.5% consistent with current guidelines for the number of days per week to engage in physical activity at a moderate intensity and 82.9% consistent with current guidelines for the number of minutes per day to exercise.

Nurses ranked physical activity counseling last in a list of ten patient care activities with a mean of 9.03 behind patient assessment and passing medications. This is consistent with current literature which states that physical needs are prioritized at a higher level than psychosocial needs. Nurses in this study ranked physical activity fifth in a list of ten lifestyle health-related activities. No current literature was found to compare to the rank assigned in this study.

Over 60% of nurses in this study self-reported confidence to counsel patients about physical activity. This is consistent with the results of their self-reported knowledge

and actual knowledge of the current guidelines. Health promotion is now included in nursing curricula, and knowledge has been noted in the literature to improve nurses confidence for patient counseling.

This study found that nurses are counseling patients in the acute care setting about physical activity. Although approximately 40% noted lack of time to counsel patients about physical activity as a barrier to counseling, an average of 24 minutes a day dedicated to counseling patients about physical activity was reported.

Having acute care nurses provide counseling on physical activity guidelines is already occurring according to the results of this study although they rank it least important as a patient care activity. This means they rank 9 patient care activities as more important than physical activity counseling. While improvement can be made on physical activity counseling by acute care nurses, time may be the challenge. Additionally, the question of feasibility to raise the rank of importance of physical activity counseling must be raised.

APPENDIX A

LETTER TO PARTICIPANTS

TITLE: **EXAMINATION OF ACUTE CARE NURSES ABILITY TO ENGAGE IN PATIENT EDUCATION RELATED TO PHYSICAL ACTIVITY AS A HEALTH BEHAVIOR**

PRINCIPAL

INVESTIGATOR: **Gretchen E. Zewe, MNEd, RN, PhD(c)**
336 Victoria Building
3500 Victoria Street
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FACULTY

MENTOR: **John M. Jakicic, Ph.D.**
Chair and Professor
Department of Health and Physical Activity
University of Pittsburgh
Suite 600, Birmingham Towers
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Pittsburgh, PA 15203
email: jjakicic@pitt.edu

Dear Staff Nurse,

The purpose of this research study is to evaluate the nurses' ability to teach patients about physical activity. I am surveying Registered Nurses on inpatient units at UPMC Presbyterian Hospital.

The survey is brief and should take about 5 minutes to complete. Each nurse will receive a survey. The surveys are numbered to assist the Principal Investigator in monitoring survey completion and to control for duplicate survey completion. The data collected from this research study survey will not be reported individually; it will only be reported in aggregate. All responses will be kept strictly confidential, and results will be kept under lock and key. All numerical links will be destroyed once the surveys are all collected. PLEASE DO NOT SIGN THE SURVEY FORM.

Once you complete the survey, please place it in the envelope provided and place it in the designated collection container on your unit. I will be rounding daily to collect completed surveys.

Your participation is voluntary. To thank you for your participation, a small snack is stapled to the survey. This research study is being conducted by Gretchen Zewe, MNEd, RN, PhD(c), who can be reached at zewegr@pitt.edu if you have any questions.

APPENDIX B

FLYER

GRETCHEN ZEWE DISSERTATION RESEARCH SURVEY

Reminder: A survey was recently distributed to you by Gretchen Zewe for her doctoral dissertation research. Please complete this survey and place it in the collection container.

Your participation is voluntary.

It will take only about 5 minutes to complete.

Your responses will be kept confidential.

Please complete only 1 survey.

Do Not Sign the Survey Form.

Many thanks!

Gretchen Zewe, MNEd, RN, PhD(c)
Doctoral Candidate
School of Education
University of Pittsburgh
zewegr@pitt.edu

APPENDIX C

UNIT DIRECTOR LETTER

Date

Dear (Unit Director): (personalized with each Unit Director's name)

In the near future I will be coming to your unit to distribute a survey for the staff nurses for my dissertation research. The purpose of this research study is to evaluate the nurses' ability to teach patients about physical activity.

The survey is brief and should take about 5 minutes to complete. Each nurse will receive a survey. I will be in contact with you to determine the most efficient way to distribute the surveys on your unit and the best location to place the survey collection container.

If you have any questions about this research, please do not hesitate to contact me a zewegr@pitt.edu. Thank you, in advance, for your support of my dissertation research.

Sincerely,

Gretchen E. Zewe, MNEd, RN, PhD(c)

Doctoral Candidate

School of Education

University of Pittsburgh

APPENDIX D

SURVEY

Instrument Number: 1016

Study ID: 179

GRETCHEN ZEWE DISSERTATION RESEARCH SURVEY

ID Number: _____ Administration Date: ___ / ___ / ____ (month) (day) (year)

Shade circles like this: ●
Not like this: ⊗ ✓

Please use BLACK Pen Only!

1. On what unit do you presently work:

○ 3E	○ 7G	○ 9G	○ 11N
○ 4D	○ 7ST	○ 9N	○ 12D
○ 5D	○ 8D	○ 10D	○ 12N
○ 5G	○ 8G	○ 10EW	○ 12S
○ 6D	○ 8N	○ 10G	
○ 7D	○ 8W	○ 10N	
○ 7F	○ 9D	○ 10S	

2. Years working on this unit:

○ 1) < 1
○ 2) 1-5
○ 3) 6-10
○ 4) 11-15
○ 5) 16-20
○ 6) 21-25
○ 7) 26-30
○ 8) 31-35
○ 9) > 35

3. Which are you presently:

○ 1 Full-time
○ 2 Part-time
○ 3 Casual

4. Gender:

○ 1 Male
○ 2 Female

5. Age:

○ 1) < 25
○ 2) 25-30
○ 3) 31-40
○ 4) 41-50
○ 5) 51-60
○ 6) > 60

6. Years of nursing experience:

○ 1) < 1
○ 2) 1-5
○ 3) 6-10
○ 4) 11-15
○ 5) 16-20
○ 6) 21-25
○ 7) 26-30
○ 8) 31-35
○ 9) > 35

34191

7. Ethnicity: Do you consider yourself to be Hispanic or Latino, that is, of Mexican, Puerto Rican, Cuban, or of Latin American descent?

- ○ 1 Yes
- ○ 2 No
- ○ 3 Unknown

8. Race: Please choose the one category that best applies to you:

- ○ 1 White
- ○ 2 Black or African American
- ○ 3 American Indian; please specify: _____
- ○ 4 Alaska Native
- ○ 5 Native Hawaiian or other Pacific Islander
- ○ 6 Asian
- ○ 7 Other; please specify: _____
- ○ 8 Unknown

9. Your initial RN Training?

- ○ 1 Diploma School
- ○ 2 Associates Degree
- ○ 3 BSN

10. Your highest degree of nursing education:

- ○ 1 Diploma
- ○ 2 Associates Degree
- ○ 3 BSN
- ○ 4 MSN
- ○ 5 PhD
- ○ 6 DNP

11. Personal activity: Have you exercised *over the past 6 months*?

○ **1 Yes** ----------> **a. Over the past 6 months, on average, how many days per week have you exercised for at least 20 minutes per day at a moderate-to-vigorous intensity, which is an intensity that will increase heart rate and breathing and cause you to perspire or sweat (activity similar to brisk walking, jogging, cycling, aerobics, etc.)?**

- ○ 0) 0 days per week
- ○ 1) 1 day per week
- ○ 2) 2 days per week
- ○ 3) 3 days per week
- ○ 4) 4 days per week
- ○ 5) 5 days per week
- ○ 6) 6 days per week
- ○ 7) 7 days per week

b. On days that you exercise, on average, how many minutes each day do you exercise?

(minutes)

○ **2 No**

c. If you do not engage in personal physical activity on a regular basis, please identify the barriers which prevent you from engaging in physical activity. (Choose all that apply.)

(1)
- ○ 1 Lack of time for exercise
- ○ 2 Exercise is inconvenient
- ○ 3 Lack of motivation to exercise
- ○ 4 Unable to exercise due to health limitations
- ○ 5 Other; please specify: _____

_____

_____

_____

(office use only)

34191

12. On the Likert Scale below, please indicate your level of agreement with the following statement by filling in the circle that corresponds to your response . . . .

"I am current on the recommended level of physical activity to prevent or treat chronic diseases and other health-related conditions."

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Strongly Disagree			Partially Agree			Strongly Agree

13a. To promote and maintain health, the current Physical Activity Guidelines for Americans recommend engaging in aerobic physical activity of a moderate intensity for how many days per week?

- ○ 0) 0 days
- ○ 1) at least 1 day per week
- ○ 2) at least 2 days per week
- ○ 3) at least 3 days per week
- ○ 4) at least 4 days per week
- ○ 5) at least 5 days per week
- ○ 6) at least 6 days per week
- ○ 7) at least 7 days per week

13b. To promote and maintain health, the current Physical Activity Guidelines for Americans recommend engaging in aerobic physical activity of a moderate intensity for how many minutes per day?

☐☐☐
(minutes)

14. On the Likert Scale below, please indicate your level of agreement with the following statement by filling in the circle that corresponds to your response . . . .

"I am confident counseling patients related to physical activity."

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Strongly Disagree			Partially Agree			Strongly Agree

15. <u>On average</u>, how much time per shift do you spend on educational patient counseling?

☐☐☐.☐ ○ **hours** (1) ○ **or** ○ **minutes** (2)

16. <u>On average</u>, of the time you spend in educational patient counseling, how much time is spent on physical activity counseling?

☐☐☐.☐ ○ **hours** (1) ○ **or** ○ **minutes** (2)

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17. Please identify barriers to physical activity (PA) counseling. (Choose all that apply.)

(1)
- ○ 1 Lack of time for PA counseling
- ○ 2 Knowledge deficit related to PA guidelines
- ○ 3 Patient not receptive to educational /PA counseling
- ○ 4 Knowledge deficit of how to counsel patients about PA
- ○ 5 Other; please specify: _____

_____

_____

(office use only)

18. Please rank the following patient care responsibilities in order of priority when you are providing care for a patient. ["1" is the most important and "10" is the least important. Use each number only once in your rankings.]

- **a. Documentation**
- **b. Passing medications**
- **c. Checking physician's orders**
- **d. Performing treatments**
- **e. Respiratory /mouth care**
- **f. Patient assessment**
- **g. Giving discharge instructions**
- **h. Explaining daily plan of care**
- **i. Patient /family teaching**
- **j. Counseling patients about physical activity**

19. Please rank the following lifestyle health-related behaviors in order of priority when you are counseling /educating a patient. ["1" is the most important and "10" is the least important. Use each number only once in your rankings.]

- **a. Physical activity**
- **b. Smoking cessation**
- **c. Nutrition education**
- **d. Weight management**
- **e. Moderate ETOH ingestion**
- **f. Medical compliance**
- **g. Immunizations**
- **h. Adequate sleep**
- **i. Stress management**
- **j. Mental /emotional health**

APPENDIX E

REMINDER LETTER FOR PARTICIPANTS

TITLE: **EXAMINATION OF ACUTE CARE NURSES ABILITY TO ENGAGE IN PATIENT EDUCATION RELATED TO PHYSICAL ACTIVITY AS A HEALTH BEHAVIOR**

PRINCIPAL

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FACULTY

MENTOR: **John M. Jakicic, Ph.D.**
Chair and Professor
Department of Health and Physical Activity
University of Pittsburgh
Suite 600, Birmingham Towers
2100 Wharton Street
Pittsburgh, PA 15203
email: jjakicic@pitt.edu

Dear Staff Nurse,

Approximately two weeks ago I distributed a survey to collect data for my research study to evaluate the nurses' ability to teach patients about physical activity. If you

already completed the survey, thank you. If you have not had a chance to complete the survey, I hope you will be able to do so now.

The survey is brief and should take about 5 minutes to complete. The surveys are numbered to assist the Principal Investigator in monitoring survey completion and to control for duplicate survey completion. The data collected from this research study survey will not be reported individually; it will only be reported in aggregate. All responses will be kept strictly confidential, and results will be kept under lock and key. All numerical links will be destroyed once the surveys are all collected. Your participation is voluntary. PLEASE DO NOT SIGN THE SURVEY FORM.

Please place completed surveys in the envelope provided and place it in the designated collection container on your unit. I will be rounding daily to collect completed surveys. Please contact Gretchen Zewe, MNEd, RN, PhD(c) at zewegr@pitt.edu if you have any questions.

APPENDIX F

DISTRIBUTION OF THE LEVEL OF IMPORTANCE OF PATIENT CARE ACTIVITIES BY NURSING SERVICE LINE

Variable	Nursing Service Line	1 F/%	2 F/%	3 F/%	4 F/%	5 F/%	6 F/%	7 F/%	8 F/%	9 F/%	10 F/%
Documen-	Cardiac	1/1	2/2	8/8.3	15/15.6	19/19.8	12/12.5	11/11.5	11/11.5	6/6.3	11/11.5
tation	Neurology	4/4.3	3/3.2	8/8.5	9/9.6	15/16	15/16	10/10.6	9/9.6	11/11.7	10/10.6
Passing	Cardiac	14/14.4	40/41.2	27/27.8	10/10.3	3/3.1	0/0	2/2.1	0/0	0/0	1/1
Medications	Neurology	6/6.4	34/36.2	25/26.6	16/17	5/5.3	3/3.2	1/1.1	2/2.1	0/0	2/2.1
Checking	Cardiac	7/7.2	19/19.2	18/18.6	26/26.8	9/9.3	7/7.2	5/5.2	2/2.1	2/2.1	2/2.1
MD Orders	Neurology	3/13.8	18/19.1	20/21.3	19/20.2	15/16	3/3.2	5/5.3	0/0	0/0	1/1.1
Performing	Cardiac	5/5.2	13/13.4	20/20.6	17/17.5	23/23.7	7/7.2	4/4.1	3/3.1	2/2.1	3/3.1
Treatments	Neurology	5/5.3	9/9.6	24/25.5	18/19.1	20/21.3	12/12.8	2/2.1	2/2.1	1/1.1	1/1.1
Respiratory/	Cardiac	1/1.0	2/2.1	4/4.2	9/9.4	16/16.7	18/18.8	8/8.3	19/19.8	10/10.4	9/9.4
Mouth Care	Neurology	3/3.2	7/7.4	2/2.1	10/10.6	15/16	18/19.1	14/14.9	11/11.7	10/10.6	4/4.3
Patient	Cardiac	71/73.2	12/12.4	5/5.2	4/4.1	2/2.1	2/2.1	0/0	0/0	0/0	1/1.0
Assessment	Neurology	73/77.7	12/12.8	1/1.1	4/4.3	0/0	1/1.1	0/0	1/1.1	0/0	2/2.1
Discharge	Cardiac	1/1	1/1	1/1	1/1	1/1	5/5.2	16/16.7	11/11.1	33/34.4	26/27.1
Instructions	Neurology	1/1.1	2/2.1	1/1.1	0/0	6/6.4	6/6.4	9/9.6	15/16	27/28.7	27/28.7
Explaining	Cardiac	2/2.1	5/5.2	9/9.3	11/11.3	9/9.3	21/21.6	18/18.6	15/15.5	5/5.2	2/2.1
Daily Plan of Care	Neurology	3/3.2	8/8.5	6/6.4	11/11.7	9/9.6	17/18.1	19/20.2	12/12.8	7/7.4	2/2.1
Patient/	Cardiac	4/4.2	1/1	1/1	5/5.2	11/11.5	19/19.8	22/22.9	20/20.8	12/12.5	1/1
Family	Neurology	3/3.2	1/1.1	4/4.3	4/4.3	4/4.3	13/13.8	28/29.5	26/27.4	9/9.6	2/2.1
Teaching											
Counseling	Cardiac	1/1	0/0	0/0	1/1	1/1	2/2.1	7/7.2	11/11.3	23/23.7	51/52.6
About	Neurology	1/1.1	1/1.1	1/1.1	0/0	1/1.1	1/1.1	3/3.2	12/12.8	25/26.6	49/52.1
Physical Activity											

Abbreviation Definitions: F = Frequency of response; % = Percentage of participants with this response

APPENDIX G

OTHER IDENTIFIED BARRIERS TO PHYSICAL ACTIVITY COUNSELING

Barrier	Cardiac Frequency	Neurology Frequency	Frequency Total
1. Manager/Not direct care	1	4	5
2. Night shift	1	1	2
3. Value Statements:			
a. Low priority	4	2	6
b. Physical Therapy does counseling	1	4	5
c. Cardiac Rehab does counseling	3	0	3
d. If patients have not exercised in their life, they will not start now	0	1	1
e. Uncomfortable to tell an overweight, sick patient to get up and exercise even though they need to	1	0	1
f. Some patients not ready to learn, other healing has to take place first	1	0	1
g. No room to talk to others due to personal lack of exercise	1	0	1
4. Clinical Statements			
a. Physical limitations/restrictions of patients	1	3	4
b. Physicians set level of activity for patients, patients need MD clearance	0	1	1
c. Patient lack of motivation	0	1	1
5. Patient Characteristics			
a. Population/history/diagnosis	4	2	6
b. Acuity – too ill	1	0	1
c. Age	0	1	1
d. Mental Status	0	1	1
e. Living condition	0	1	1
f. Pain (not right time to talk about it)	0	1	1

APPENDIX H

DISTRIBUTION OF THE LEVEL OF IMPORTANCE OF LIFESTYLE HEALTH-RELATED BEHAVIOR BY NURSING SERVICE LINE

Variable	Nursing Service Line	1 F/%	2 F/%	3 F/%	4 F/%	5 F/%	6 F/%	7 F/%	8 F/%	9 F/%	10 F/%
Physical	Cardiac	4/4.1	11/11.1	13/13.4	20/20.6	13/13.4	6/6.2	13/13/4	5/5.2	6/6.2	6/6.2
Activity	Neurology	6/6.5	10/10.8	6/6.5	14/15.1	15/16/1	9/9.7	5/5.4	11/11.8	7/7.5	10/10.8
Smoking	Cardiac	7/17.5	17/17.5	17/17.5	14/14.4	6/6.2	3/3.1	1/1	8/8.2	10/10.3	4/4.0
Cessation	Neurology	7/18.3	19/20.4	20/21.5	10/10.8	8/8.6	4/4.3	7/7.5	2/2.2	5/5.3	1/1.1
Nutrition	Cardiac	6/6.1	29/29.6	22/22.4	16/16.3	11/11.2	8/8.2	1/1	2/2	1/1	2/2
Education	Neurology	7/7.5	21/22.6	17/18.3	8/8.6	13/14	11/11.8	6/6.5	4/4.3	5/5.4	1/1.1
Weight	Cardiac	2/2.1	12/12.4	11/11.3	7/7.1	18/18.6	14/14.4	12/12.4	13/13.4	7/7.2	1/1
Management	Neurology	6/6.5	8/8.6	15/16.1	17/18.3	14/15.1	11/11.8	8/8.6	8/8.6	5/5.4	1/1.1
Moderate	Cardiac	1/1	0/0	2/2	3/3.1	9/9.3	10/10.3	11/11.3	15/15.5	22/2.7	24/24.7
Alcohol Ingestion	Neurology	2/2.2	4/4.3	6/6.5	6/6.5	7/7.5	10/10.8	8/8.6	11/11.8	20/21.5	19/10.4
Medical	Cardiac	8/70.1	8/8.2	3/3.1	7/7.2	3/3.1	3/3.1	3/3.1	1/1	0/0	1/1
Compliance	Neurology	65/69.9	6/6.5	8/8.6	4/4.3	3/3.2	4/4.3	3/3.2	0/0	0/0	0/0
Immuni-	Cardiac	1/1	1/1	4/4.1	3/3.1	4/4.1	9/9.3	14/14.4	11/11.1	14/14.4	36/37.1
zations	Neurology	4/4.3	7/7.5	2/2.2	5/5.4	5/5.4	2/2.2	21/22.6	6/6.5	11/11.8	30/32.3
Adequate	Cardiac	2/2.1	5/5.1	6/6.2	8/8.2	9/9.3	13/13.4	17/17.5	17/17.5	11/11.3	9/9.3
Sleep	Neurology	3/3.2	4/4.3	4/4.3	8/8.6	11/11.8	12/12.9	8/8.6	21/22.6	12/12.9	10/10.8
Stress Man-	Cardiac	2/2.1	5/5.2	11/11.3	11/11.3	9/9.3	22/22.7	13/13.4	7/7.2	16/16.5	1/1
agement	Neurology	4/4.3	5/5.4	10/10.8	10/10.8	8/8.6	13/14.0	11/11.8	16/17.2	13/14.0	3/3.2
Mental/Emo-	Cardiac	3/3.1	6/6.1	9/9.2	10/10.2	13/13.3	7/7.1	9/9.2	18/18.4	8/8.2	15/15.3
tional Health	Neurology	4/4.3	7/7.5	8/8.6	7/7.5	8/8.6	13/14.0	11/11.8	10/10.8	11/11.8	14/15.1

Abbreviation Definitions: F = Frequency of responses; % = Percentage of participants with this response

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