EXERCISE ACUTELY IMPROVES COGNITION IN HEALTHY OLDER ADULTS: THE ROLE OF AROUSAL

Pearl N. Cummins,[1] James Kent,[2] Timothy Weng,[3] Vincent Magnottta,[2] Gary Pierce,[2] and Michelle Voss[4], 1. *San Diego State University, San Diego, California, United States*, 2. *University of Iowa, Iowa City, Iowa, United States*, 3. *University of Texas, Austin, Texas, United States*, 4. *University of Iowa, Iowa City, United States*

Previous researchers have reported that aerobic exercise improves cognition in older adults; however, few researchers have examined the role of arousal on improvements in cognition after exercise. The purpose of this study was to understand how changes in arousal acutely affect changes in cognitive performance after a single session of light compared to moderate intensity aerobic exercise. Cognitively normal older adults (N = 34) were enrolled in a randomized controlled trial where they were asked to complete the N-back task with faces, a cognitive task used to test working memory, in an fMRI scanner. On separate days, the task was completed before and 15 to 20 minutes after light and moderate intensity exercise. An intervention was also completed, but our question focuses on the acute effects of exercise rather than training. Arousal was measured before and after exercise through a questionnaire and a direct measure of physiological activation of the sympathetic nervous system with galvanic skin response (GSR). On average, resting GSRs decreased from pre- to post-exercise scan; however, the change was not statistically significant. The decrease in arousal after light exercise indicated that older adults had decreased sympathetic activity after both light and moderate intensity exercise. By contrast, N-back task performance improved most after moderate compared to light intensity exercise. Together, evidence that sympathetic activity tended to decrease generally for both intensities, whereas cognitive improvements were more specific, suggests that changes in arousal at rest were not a critical factor connecting exercise and improved working memory in this study.

INVESTIGATING THE ROLE OF AHR IN MEDIATING SEX DIFFERENCES OF AGING MACROPHAGES

Evelyn Navar,[1] Bérénice A. Benayoun,[2] Nirmal Sampathkumar,[2] and Jisoo Chae[2], 1. *University of California at Davis, Davis, California, United States*, 2. *University of Southern California, Leonard Davis School of Gerontology, Los Angeles, California, United States*

"Inflamm-aging" describes a state of chronic low-grade inflammation which occurs with age in the absence of infection. This process is related to many chronic age-related diseases. Aryl hydrocarbon receptor (Ahr), is a transcription factor that is thought to decrease inflammation, and decrease of Ahr with aging only in females was previously observed in a macrophage RNA-seq with aging. Based on this, I hypothesized that 1) Ahr expression will decrease with age in female cells; and 2) phagocytic activity and Ahr expression in macrophages will increase when exposed to estrogens (E2). To test these hypotheses, Ahr signaling was quantified by RT-qPCR in aging male and female mice BMDMs, and in macrophages that were treated with E2. I also performed a phagocytosis assay on macrophages treated with E2. I found a significant downregulation of Ahr in old female BMDMs. Ahrr (Ahr Repressor) was significantly downregulated in both old female and males with aging. Arnt (Ahr Nuclear Translocator) did not significantly change with aging. The qPCR performed on the E2 treated cells showed no significant trend for Ahr regulation. Finally, the phagocytosis assay revealed an overall increase in phagocytosis activity in cells treated with estrogen. Our hypotheses were supported by data showing a decrease in Ahr expression with age and increase in phagocytosis activity in estrogen treated cells. The RT-qPCR results for the E2 treated cells did not support our hypothesis, but could stem from a relatively short exposure time for estrogen.

PRIVACY AND SECURITY FOR TELEHEALTH DEVICES

London Thompson,[1] and Csilla Farkas[2], 1. *Claflin University, Columbia, South Carolina, United States*, 2. *University of South Carolina, Columbia, South Carolina, United States*

In this research, we study the privacy and security capabilities provided by telehealth devices. Our aim is to evaluate how vulnerable these popular devices are in the presence of malicious cyber attackers. As older adults increasingly rely on telehealth devices, it is crucial that cybersecurity aspects of these devices are clearly communicated to them. Moreover, older adults frequently lack the technical expertise to evaluate the security and privacy capabilities of the devices. The lack of control over telehealth devices is a major concern for older adults. Older adults view certain limitations within these devices as decreasing their privacy and security. These limitations include the lack of control over accepting calls, taking screenshots, and assigning access privileges. For large scale adaptation of telehealth devices by older adults, it is crucial that these devices not only satisfy their intended purpose but also exhibit user friendly features and strong security and privacy capabilities. Modeling cyber threats against telehealth devices is not studied sufficiently . Malicious actors may compromise telehealth devices and create further threats to security and privacy of the users. In this research, we studied the cyber threats against telehealth devices. We built a threat model that ranks cyber threats based on their impact. We investigated how the operating system of popular devices supports access control. We found that none of the current technologies support location-based access control. We claim that this represents a major limitation and that supporting location-based access control is necessary to ensure users' privacy in their own home.

WALKING AWAY FROM LONELINESS: THE MEDIATING ROLE OF SOCIAL ISOLATION

Natalie Shellito,[1] and Nidya Velasco Roldan[1], 1. *University of Massachusetts Boston, Boston, Massachusetts, United States*

This study examines the relationship between physical activity (PA) and loneliness among older adults. Participation in walking enables individuals to come into contact with other people, thus social isolation may mediate the relationship between walking and loneliness. The study uses participants from the Leave Behind Questionnaire of the 2016 data wave of the Health and Retirement Study with a sample size of 6,157. The dependent variable, loneliness, is measured using the 11-item UCLA Loneliness Scale and

the independent variable, walking, is measured as participants who walk 20 minutes or more per day. The mediator, social isolation, is measured using a standardized 9-item score, including closeness and frequency of contact with children, friends, and other family members, and participation in group activities. We analyzed the effect of walking on loneliness and the role of social isolation as a mediator of that relationship using structural equation modeling. Our results suggest that walking is significantly associated with lower levels of both social isolation (B=-.10) and loneliness (B=-.05). As well, there is a positive association between social isolation and loneliness, as social isolation increases, so does loneliness (B=0.31). Moreover, results from the mediation analysis using bootstrapping suggest that social isolation partially mediates the relationship between walking and loneliness (B=-.03). Our findings confirm the benefits of PA on wellbeing. This research provides evidence that suggests establishing walking programs may decrease the risk of loneliness. Future interventions concentrated on lowering social isolation through PA among older adults should consider the opportunity to reduce loneliness.

THE IMPACT OF FUNCTIONAL DISABILITY ON HOSPITALIZATION SPENDING IN SINGAPORE

Cynthia Chen[1], *1. Saw Swee Hock School of Public Health, Singapore, Singapore, Singapore*

Singapore is one of the fastest-aging populations due to increased life expectancy and lowered fertility. Lifestyle changes increase the burden of chronic diseases and disability. These have important implications for social protection systems. The goal of this paper is to model future functional disability and healthcare expenditures based on current trends. To project the health, disability and hospitalization spending of future elders, we adapted the Future Elderly Model (FEM) to Singapore. The FEM is a dynamic Markov microsimulation model developed in the US. Our main source of population data was the Singapore Chinese Health Study (SCHS) consisting of 63,000 respondents followed up over three waves from 1993 to 2010. The FEM model enables us to investigate the effects of disability compounded over the lifecycle and hospitalization spending, while adjusting for competing risk of multi-comorbidities. Results indicate that by 2050, 1 in 6 older adults will have at least one ADL disability and 1 in 3 older adults will have at least one IADL disability, an increase from 1 in 12 elders and 1 in 5 elders respectively in 2014. The highest prevalence of functional disability will be in those aged 85 years and above. Lifetime hospitalization spending of elders aged 55 and above is US$24,400 (30.2%) higher among people with functional disability compared to those without disability. Policies that successfully tackle diabetes and promote healthy living may reduce or delay the onset of disability, leading to potential saving. In addition, further technological improvements may reduce the financial burden of disability.

SELF-PERCEPTION OF AGING AND ASSOCIATED CHARACTERISTICS AMONG OLDER ADULTS

Timothy L. Barnes,[1] Shirley Musich,[1] Shaohung Wang,[1] Sandra Kraemer,[2] and Charlotte Yeh[3], *1. Optum, Eden Prairie, Minnesota, United States, 2. UnitedHealthcare, Minneapolis, Minnesota, United States, 3. AARP Services, Inc., Washington, District of Columbia, United States*

Positive self-perception of aging has been linked to better physical and psychosocial health outcomes among older adults. Negative self-perception of aging has been associated with poorer health consequences including depression, limited mobility, and mortality. Despite significant findings, the comprehensiveness and quality of self-perception of aging research still warrants further investigation, especially when identifying factors for intervention. Using a large random stratified sample of AARP Medicare Supplement insured members, age≥65 years, with continuous coverage for ≥12 months, self-perception of aging and various sociodemographic, medical, and psychosocial characteristics were examined using Chi-square and multivariate logistic regression models. Self-perception of aging was measured using the five-item Attitudes Towards Own Aging subscale. Characteristics of interest included age, gender, health status, resilience, purpose, optimism, social network, physical activity, depression, falls, vision, hearing, oral health, and sleep quality. Propensity weighting was used to adjust for potential survey non-response bias. Of weighted survey respondents (N=14,046), 59% exhibited a positive self-perception, while 41% exhibited a negative self-perception. Respondents with a positive self-perception were more likely to be healthier, younger (<75 years), more active (≥3days), less depressed, have more diverse social networks, higher resilience, and purpose. Negative self-perception was associated with poorer health, older age, depression, and poorer vision, hearing, oral health, and sleep quality. The strongest characteristics associated with positive self-perception were purpose, resilience, physical activity, and social networks. Depression and sleep quality were the strongest characteristics associated with negative self-perception. Interventions targeting these characteristics could be beneficial in promoting positive self-perception of aging and health over time.

THE CURRENT SITUATION AND INFLUENTIAL FACTORS OF FRAILTY IN ELDERLY PATIENTS WITH DIABETES IN CHINA

Fumin Dai,[1] Wenwen Jia,[1] and Mengdie Jiang[2], *1. Henan Provincial People's Hospital, Zhengzhou, Henan province, China, 2. Henan University, Zhengzhou, Henan, China*

Patient with diabetes may increase the incidence of frailty. Frailty cause chronic inflammation and insulin resistance. The purpose of this study is to investigate the current situation of frailty and its influencing factors in elderly patients with diabetes. Totally 300 elderly patients with diabetes were selected from a tertiary hospital in Zhengzhou of China via convenience sampling method , and were investigated by self-designed general information questionnaire , TFI (Tilburg Frailty Indicator) and SDSCA(Scale of Diabetes Self-care Activities). Totally 296 valid questionnaires were collected. A total of 137 elderly patients with diabetes suffered from frailty and the prevalence was 46.3%. The mean score of total frailty was (5.26±2.87) and the scores for each dimension were as follows: physical frailty (2.79±2.08), psychological frailty (1.40±0.94) and social frailty (1.07±0.75). Multiple linear regression showed that comorbidity, self-management behavior, glycosylated hemoglobin, educational degree, polypharmacy and smoking were the major