

ACCESSION NO: 1016109 **SUBFILE:** CRIS
PROJ NO: WNP00005 **AGENCY:** NIFA WN.P
PROJ TYPE: HATCH **PROJ STATUS:** NEW
START: 15 JUN 2018 **TERM:** 30 SEP 2022

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PROMOTING HEALTH AND WELLNESS OF INDIVIDUALS, FAMILIES, & COMMUNITIES

NON-TECHNICAL SUMMARY: Creating a healthy nation is a top priority in the United States. This Washington State University Hatch project titled, Health & Wellness Umbrella Project organizes diverse research projects conducted by WSU faculty from multiple disciplines and intends to collectively advance health-related knowledge and scholarship. This collaboration will also translate newly gained knowledge to educational and community-based activities. Our overall goals are: (1) Advance and extend the empirical knowledge base of health and wellness through scholarly activities across a wide range of academic disciplines (percentage of effort, 50%) and, (2) Based on research findings, translate knowledge to outreach, educational, and community-based activities to improve the quality of life of individuals, families, and communities (percentage of effort, 50%). The approximate distribution of percentage of effort between research, education, and extension will be 50%, 25%, and 25%, respectively. This hatch project is primarily managed by Dr. Yoshie Sano (Principal Director) in the department of Human Development and Dr. Hang Liu (Co-Principal Director) in the department of Apparel, Merchandise, Design, and Textile. To improve the health and wellness of all Americans, evidence-based research and outreach is greatly needed. This umbrella project collects and analyses empirical data from a range of methodologies including interviews, surveys, and experiments in a chemistry lab. We will then disseminate the evidence-based findings to not only scholars, but also to wider audiences who are working directly or indirectly with individuals, families, and communities in rural America. Specifically, we focus on areas which represent growing needs of improvement: (1) rural, low-income families' access to healthcare in the context of healthcare reform; (2) prevention and management of heart disease--one of the top five leading causes of adult death; and (3) financial exploitation of older adults by family members and relatives. Investigations in each topic area will be conducted by the WSU researchers. Through our individual projects, this collective umbrella project will have multi-level impacts that include: (1) improved health and well-being of rural low-income families and health-related policies that take into account the needs of rural families and communities; (2) minimized occurrence of fatal heart diseases by providing continuous human vital sign monitoring, flagging critical health conditions, and communicating the condition to families or healthcare providers, which in turn will reduce the fatality rate due to heart diseases and decrease the associated medical cost; and (3) enhanced understanding of family experiences and the consequences of elder financial exploitation, which will benefit families and communities by being able to proactively address family risk and resiliency

factors, as well as increase the likelihood of effective interventions to support and protect elders. Additionally, the findings of this project will be disseminated through various forms including peer-reviewed publications, conference presentations, research and policy briefs, and training materials for elected officials, community stakeholders, program administrators, students, and consumers.

OBJECTIVES: Creating a healthy nation is a top priority in the United States. This Washington State University Hatch project titled, Health & Wellness Umbrella Project organizes diverse research projects conducted by WSU faculty from multiple disciplines and intends to collectively advance health-related knowledge and scholarship. This collaboration will also translate newly gained knowledge to educational and community-based activities. Our overall goals are: (1) Advance and extend the empirical knowledge base of health and wellness through scholarly activities across a wide range of academic disciplines (percentage of effort, 50%) and, (2) Based on research findings, translate knowledge to outreach, educational, and community-based activities to improve the quality of life of individuals, families, and communities (percentage of effort, 50%).

APPROACH: The procedures that will be used to achieve the objectives are listed below in the order of the objectives. Objective 1-1: To conduct extensive higher order analyses to explore factors that create barriers or enhance the physical and mental health of diverse rural low-income families. • Based on the data previously collected, we will examine interrelationships among health variables and family functioning and health outcomes. We will also identify change and stability over time in key predictors of rural health and well-being. For example, we hypothesize that access to health care in a local community has significant positive associations with the reported health status of family members. We also expect that this association will be mediated by informal social support that a family receives and individual characteristics. Appropriate analyses, such as multivariate analysis (multiple linear and logistic regression including repeated measures) will be utilized to model the combined effects of the hypothesized variables on target health outcomes. Objective 1-2: To understand the impact of the Affordable Care Act (ACA) on rural low-income families. • Interviews will be conducted to collect data from families and community service providers in order to assess changes in individual and family health and well-being in rural communities before and after the full implementation of the ACA. Two lines of follow-up questioning will be conducted with a small sampling of participants. One line will examine the ability to access medical care and if there are differences with individuals with private insurance versus individuals with government provided plans. Objective 1-3: To develop a PANi based conductive flexible sensor. To achieve this objective, spinning apparatus for conductive fiber production will be designed first and the fiber spinning parameters will be determined then. A single jet electrospinning apparatus, which consists of a single polymer supply device, a high voltage supply, and a rotating disk with controllable speed to collect aligned fibers, is available in the Textile Research Laboratory. In order to produce bi-component side-by-side fibers, the polymer supply device needs to be redesigned with two jets. Before systematically study of how the fiber properties are influenced by the polymer solution properties and spinning parameters, preliminary work needs to be completed to determine the ranges of these parameters that within which continuous and uniform nanofibers can be produced. Once these parameters are determined, nanofiber PANi fibers will be produced. Objective 1-4: To evaluate the physical/mechanical properties of the sensor as well as its conductivity. • Those electrical, physical, and mechanical properties that are critical to fiber performance will be evaluated for the bicomponent fibers produced with varying the processing parameters within the ranges identified. These physical/mechanical properties include fiber diameter, cross-section shape and distribution of the two polymers in the fiber, fiber surface contour, tensile properties, and microstructures. The influence of the processing parameters on these properties will be studied. Objective 1-5: To fabricate the nanofiber into a sensor and integrate onto a garment. The nanofibers will be fabricated into a flexible sensor, which be laminated as a patch and sewn onto a

garment. The washability and durability of the sensor will be evaluated in this step. Objective 1-6: To identify risk and protective factors in family systems that increase or decrease the likelihood of family elder financial exploitation. Objective 1-7: To understand family members' experiences (thoughts and feelings) related to elder financial exploitation by a relative. Objective 1-8: To identify the range and scope of family experiences foundational to family elder financial exploitation, including the consequences of EFE on family systems. • A mixed-methods approach will be utilized for the above three objectives. A survey has been developed to collect data regarding participant demographics and other key facts regarding EFE experiences. This survey is available via Qualtrics and will be administered to participants in a face-to-face setting by a member of the research team. We will also utilize in-depth interviews with participants. In addition to descriptive analyses, inferential statistics, such as t-tests and ANOVAs will be used to make comparisons between groups based on demographic data and between non-exploitive and exploitive cases. Objective 2-1: To disseminate research findings in order to increase knowledge and understanding among family-serving professionals and policy makers regarding factors that contribute to or create barriers to healthcare access of rural, low-income families as well as elder financial exploitation. • We will carry the voice of rural families as well as the elderly to policy makers, so that policy makers will be aware of the environments as it interfaces with policy. Additionally, Project members will collaborate to address research questions and prepare manuscripts for submission to peer-reviewed journals, prepare peer reviewed conference proposals, develop policy and research briefs, lessons plans for use in college classes, as well as educational materials for policy makers, program administrators, and consumers. Objective 2-2: To provide findings and implications to be used by gerontology, family studies, and family economics researchers and educators, law enforcement and attorneys, community-based practitioners, and family members. • Outreach plans include Extension electronic media and print publications to the target populations, as well as professionals working with them including social service agents, case managers, lawyers, law enforcement personnel, Adult Protective Services (APS) professionals, accountants, financial planners, bankers, health, gerontology, and family and consumer sciences, family therapists, consumer specialists, educators, as well as policymakers. Many of these will be produced and distributed widely in association with Washington State University Extension Offices. Other outreach activities planned include informational fact sheets, publication of papers and public presentations. Other outreach activities are planned, including a webinar for both scholars and general audience. Objective 3-1: Create and support opportunities to share and learn about on-going research activities across disciplines within Washington State University. • Multiple strategies to promote inter-campus research dialogues will be implemented. First, we will reach out interested faculty in Washington State University's Elson S. Floyd College of Medicine which was recently created as a public medical school in the state of Washington. We plan to start a dialogue with the Medical School faculty to explore a collaborative research alliance and possible collaborations. Second, outreach efforts will be made to recruit potential collaborators for the Health & Wellness Umbrella Project to faculty across different disciplines, extension specialists, as well as other researchers at Washington State University. For example, we plan to visit Partnerships for Native Health in 2018 to learn about their research activities. Finally, we will explore relevant work conducted by WSU researchers to establish scholarly network across campuses. Objective 3-2: Establish integrative dissemination plan and engage in translation activities among WSU and non-WSU health researchers. • We plan to have an annual meeting where participants of this project meet and discuss their progress on their research projects. The specific dissemination plan will be discussed and determined at the meeting. In order to facilitate the discussion, we plan to invite a guest speaker who has expertise in effective dissemination methods.

KEYWORDS: Rural poverty; Health and Wellness; Rural elderly; Rural health; Elder financial exploitation

