Sasakawa Nursing Fellowship Progress Report 2024

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I am reporting on my progress studying at a graduate school in United States fiscal year 2024. I am a second-year PhD student at School of Nursing, University of California, San Francisco (UCSF). My research focus lies in gerontology, especially the intersection of aging, vision health, and mental health, which I explore in my doctoral dissertation. My long-term goal is to generate robust scientific evidence that addresses health issues faced by older adults living with functional impairments. Through my doctoral training, I aspire to obtain solid research skills to independently design and implement impactful health research. The PhD program at UCSF provides a rigorous educational foundation to acquire essential theoretical and methodological knowledge for advancing knowledge in the health science.

Over the past year, I dedicated my time to completing coursework, preparing qualifying exam papers, and delivering academic presentations. In our program, second-year PhD students are required to finish core courses as a prerequisite for the qualifying exam. My curriculum weighted on quantitative research, covering key areas such as epidemiology, biostatistics, clinical trial, and meta-analysis. These courses significantly strengthened my expertise and analytical skills in public health. Epidemiology courses offered me the essential knowledge to quantify the impact of disease on health outcomes in population-based approaches. I leaned critical appraisal skills on study evidence by understanding study designs, sources of bias, and causal assumptions. I also gained hands-on experience with Directed Acyclic Graphs (DAGs). Through biostatistics classes, I developed essential skills for conducting statical analyses. I learned key regression techniques, diagnostic procedures, and assumptions for interpreting quantitative data in academic contexts. These skills have enhanced my ability to evaluate and report statistical findings effectively. In the clinical trial class, I learned various aspects of intervention study designs, including randomization methods, recruitment strategies, participant adherence, and ethical considerations for protecting participant safety. The practical knowledge acquired in this class is beneficial to understand administrative issues related to unique healthcare systems and legal regulations in United States. These knowledges are supporting my research assistant work in two ongoing clinical trials. The meta-analysis course trained me in techniques to synthesize research findings systematically. I practice calculating pooled effect sizes, detecting heterogeneity, and assessing potential publication bias using statistical tools. These skills are useful for future independent meta-analysis research.

One of the most impressive class, epidemiology in aging, I learned the life course approach in aging studies. The life course approach aims to identify the late-life disease risk to long-term biological and psychosocial exposures acting during gestation, childhood, adolescence, earlier in adult life or across generations.[1] In my area of interest, for example, late-life depression results from cumulative disadvantages across the lifespan, such as childhood poverty, low education, or midlife stress. From a prevention standpoint, identifying the sensitive periods that has accumulating adverse effect on the outcome across the life span helps to determine intervention points to break the chain of adverse exposure and rebuild a new trajectory for healthy aging. Interestingly, I also learned there are unique methodological challenges in the life course approach when applying aging studies. For instance, measurement error can arise due to recall bias when collecting early life event data. Relying on proxy respondents may also introduce measurement errors, depending on the knowledge of the individual reporting. The accuracy in measuring late-life depression is further complicated by the overlap of symptoms with cognitive impairment or early-stage dementia. Longitudinal research in older populations often suffers from high attrition rates due to mortality, potentially resulting in selective survival bias and limiting the generalizability of findings. Regarding confounding bias, time-varying confounding across a lifespan should be carefully accounted for in analytical models. Despite these challenges, this conceptual lens offers a valuable framework to uncover key determinants of health across the life course and determine personalized, life stage-specific interventions. In summary, the coursework focusing on quantitative methodology in public health enriched my understanding of study design, analytic rigor, and strategic use of epidemiological tools in aging research.

In my PhD program, passing qualifying exam (QE) including writing three papers and oral examination is necessary to advance to PhD candidacy. The three papers consist of a systematic review, a theoretical development or analysis, and a measurement analysis. Preparing for QE is a valuable training for PhD students to establish foundation in core research methodologies and develop expertise in their specific research areas.

Older adults often experience geriatric syndromes as biological aging process accelerates. Geriatric syndrome is a term to describe common health conditions in older adults that are multifactorial in cause and do not fit into traditional organ-based disease categories.[2] These syndromes include cognitive decline, frailty, urinary incontinence, falls, polypharmacy, delirium,

depression, hearing loss, and visual impairment. The components of geriatric syndromes are complexly interrelated each other, and can impact on their quality of life and functional abilities. Understanding the mechanisms linking their causes and symptoms is essential for improving the quality of care. The World Health Organization developed the Integrated Care for Older People (ICOPE) framework[3] to comprehensively address the geriatric syndromes by focusing on optimizing intrinsic capacity (i.e., physical and mental abilities) through a person-centered, function-focused care. This framework aims to promote healthy aging and reduce the risk of care dependency in older adults. However, current evidence on the mechanisms by which each geriatric syndrome symptoms influence one another remains limited. Identifying potential causal pathways among these symptoms using population-based data is crucial to advancing our understanding of their interrelationships and guiding effective designs of integrated, preventive care strategies for older adults.

My QE paper will focus on exploring the characteristics and factors with depressive symptoms in older adults with visual impairment in relation to geriatric syndromes. Visual impairment is the fourth most common disabilities in older adults globally,[4] and about 25% of older adults with visual impairment experience depressive symptoms.[5] While visual impairment is known to increase mortally and cognitive decline in older adults, its impact on depression remains understudied. Whereas prevention and early detection are effective in reducing the severity of depression, such initiatives are still insufficiently implemented. Since depressive symptoms in old age often overlap with dementia symptoms, it is more likely to go underdiagnosed compared to younger populations. Thus, determining the unique characteristics of depression in this population is essential to enable prevention and timely detection. I hope the evidence via QE papers will fill knowledge gaps and inform clinical implications for future targeted preventative approaches for depressive symptoms in older adults with visual impairment.

Throughout this year, I have mainly worked on systematic review and method papers. My systematic review synthesizes existing evidence on risk and protective factors for depressive symptoms in older adults with visual impairment. I collaborated with academic advisors and medical librarians to conduct the review process, including protocol registration, search strategy development, data import, and abstract/full-text screening using Covidence. These steps emphasize the importance of transparent and reproducible research methods for getting trustworthy evidence. My method paper investigates factors for depressive symptoms in

oncology patients during the COVID-19 pandemic. Through a secondary data analysis, I expanded my understanding of the clinical presentation of depression in oncology patients and refined my statistical analysis skills. These experiences strengthened my analytical abilities and deepened my understanding of depression in vulnerable populations, building a foundation for future work with older adults.

I attended the 2024 Annual Scientific Meeting of the Gerontological Society of America in Seattle. I presented a poster on a theoretical analysis for the Disablement Process Model[6] to evaluate its applicability to late-life vision loss. Engaging discussions expanded my knowledge in the context of disability studies and successful aging. Further, several symposiums on digital divide issues and applications of artificial intelligence broadened my perspective on the challenges older adults face, including accessibility, digital literacy, privacy, and confidentiality. The gained valuable insights will inform future research to investigate facilitators and barriers to digital technology use in older adults with functional impairments. Networking with researchers outside UCSF who share a passion for aging research was meaningful to update the latest trends of gerontological research and build a foundation for potential collaboration.

The third year of a PhD program require to defend a qualifying exam and PhD dissertation proposal aligned with my research interests. My primary focus will be completing my qualifying exam papers and developing a dissertation proposal for advancing PhD candidacy. Continued training to strengthen my research skills is essential. Presenting at future academic conferences in nursing and gerontology will help me to foster multidisciplinary collaborations with leading international scholars.

In conclusion, my second year of doctoral study at UCSF has significantly deepened my theoretical and methodological expertise in aging research. Rigorous coursework, scholarly writing, and active participation in academic conferences strengthened my foundation to pursue independent and impactful research. I will continue to develop my research skills, complete my qualifying exam, and advance my dissertation work. I will commit to creating scientific evidence to improve health and well-being in older adults with functional impairments, and to promote equitable, person-centered care through multidisciplinary collaboration.

I sincerely appreciate the generous supports from the Sasakawa Health Foundation. This prestigious fellowship has been vital in supporting my doctoral studies in the United States and in fostering my professional and personal development as a nurse scientist aiming for creating

innovative solutions to address global challenges in gerontology. I am also profoundly thankful for the world-class faculty, brilliant scholars, supportive colleagues, and inspiring atmosphere at UCSF.

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