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Rurality's Impact on Alaska Native Elders' Levels of Physical Activity and Obesity

Jessie Doherty
Walden University

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Walden University

College of Health Sciences and Public Policy

This is to certify that the doctoral study by

Jessie Doherty

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2025

Abstract

Rurality's Impact on Alaska Native Elders' Levels of Physical Activity and Obesity

by

Jessie Doherty

MPH, University of Alaska Anchorage, 2018

BA, University of Alaska Anchorage, 2008

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

November 2025

Abstract

While there have been studies on obesity levels and physical activity levels across many populations and age groups, few studies have focused on Alaska Native Elders. The purpose of this study was to examine rurality (urban vs. rural counties), physical activity, and obesity level while controlling for sex, self-reported loneliness, and self-reported stress. The theoretical foundation for this study was based on the socio-ecological model (SEM), and the research questions in this study explored how rurality impacted obesity levels and how rurality impacted physical activity levels in Alaska Native Elders. The methodology of this study was a quantitative cross-sectional design analyzing data from 2023 CDC Behavioral Risk Factor Surveillance System (BRFSS) data, including only Alaska Native Elder respondents aged 50 and over ($N = 360$). The data analytic procedures included bivariate analysis and complex sample multiple logistic regression to understand the impact of rurality on physical activity levels and obesity levels. Results indicated no association between rurality and physical activity levels or rurality and obesity levels; however, there was a significant association between obesity level and loneliness (Wald $F = 85.630$, $p < 0.001$) and stress (Wald $F = 3.505$, $p < 0.001$). The findings of this study highlight the impact of loneliness and stress on obesity levels in Alaskan Native Elder populations and could positively impact mental health care for this subpopulation. Future positive social change could also support increased physical activity levels and reduced obesity levels in this population, and more unified Elder Care programming across Alaska.

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Dedication

This work is dedicated to my mother, Debbie, my sister, Kellie, and my late father, Ed; they understood my desire to “Know All The Things” and always encouraged my thirst for knowledge.

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To my Cohort-mates, who kept me motivated and moving forward so we could all go to Disney World after graduation; to my friends and colleagues at the State of Alaska, Department of Health, who encouraged me to continue broadening my education; to my Chair, Dr. Manoj Sharma, and Committee Member, Dr. Tolu Osoba, who helped shape my study; and to Dr. Gadarowski and Dr. Banerjee, who guided me through the sticky bits.

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Section 1: Foundation of the Study and Literature Review

Obesity occurs when a person carries excess fat on their body and when their body mass index (BMI) is over 30. Globally, obesity has been steadily trending upward in the last 30 years, with the latest statistics from the World Health Organization (WHO, 2024) indicating that around 1 in 8, or over 1 billion people, experience the condition. This chronic condition has also been linked to many other chronic diseases such as diabetes, hypertension, cancers, joint decline, mental health issues, sleep challenges, asthma, and ultimately can decrease healthy life years (Centers for Disease Control and Prevention [CDC], 2022).

According to the CDC, obesity in the United States was at almost 42% during the last National Health and Nutrition Examination Survey (NHANES; Steirman, 2021). The Physical Activity, Nutrition, and Obesity Report (2020) indicated that obesity has been rising in Alaska for the past three decades, with Alaska-specific rates increasing from 13% (1991) to 31% (2018). It rose drastically again between 2018 and 2021 to 33.5%, as reported by the CDC's (2020) Behavior Risk Factor Surveillance System (BRFSS) Adult Obesity Prevalence Map.

Background

The level of obesity experienced by the American Indian/Alaska Native peoples residing in Alaska is disproportionately high at 37.1% when compared to the overall obesity rates for Alaska (33.5%), though according to the U.S. Department of Health & Human Services, American Indians/Alaska Natives only make up about 19.6% of Alaska's total population (CDC, 2018, 2023a; U.S. Department of Health & Human

Services, n.d.).

The disparate level of obesity may be attributed to many factors, such as the location of the communities, the lack of infrastructure to be physically active in communities, extreme weather patterns, safety concerns, generational trauma, and other sociodemographic factors such as education levels, loneliness, stress, and household income levels (Denny et al., 2005; Goins, et al., 2022; Hauser et al., 2021; Hirshberg & Sharp, 2005; Papadopoulou, 2003).

The population studied was Alaska Native Elders, aged 50 and above, which, to the researcher's knowledge, has not yet been studied in this context. Many studies investigate obesity across the lifespan, in children, and/or in adults, but none have delved deeper into the older adult age range separately. While some studies have found that adapting physical activity interventions tailored to the American Indian/Alaska Native cultural needs can be effective, few individual Tribe efforts and no statewide program implementations across Alaska have been attempted (Hopkins et al., 2023; Lewis, 2014). There was no state-level data indicating that rurality impacts obesity level and physical activity, and the most recent data to be analyzed was from the 2023 BRFSS dataset. This questionnaire included newer Alaska-specific questions and the new Social Determinants of Health questions, initially added in the 2022 cycle.

Problem Statement

The specific research problem addressed was that it is not known to what extent rurality (living in urban vs. rural counties) impacts levels of physical activity and obesity levels in older Alaska Native adults in Alaska, when considering self-reported loneliness

and self-reported stress among adults aged 50 and older. Alaska Native adults experience obesity rates of 37.1% compared to 33.5% statewide (CDC, 2023b), and no studies have examined how geographic isolation impacts physical activity and obesity specifically among Alaska Native Elders (50+). This relationship becomes increasingly critical as Alaska's Elder population is projected to reach almost 64,000 by 2050 (State of Alaska, 2024a). The age range chosen for this study is also of particular note, as it aligns with both cultural definitions of Elder status in many Alaska Native communities and common age thresholds within Alaska Native healthcare organizations (Brooks-Cleator & Lewis, 2020; Stanford Medicine, 2014). The purpose of this quantitative study was to examine how rurality impacts physical activity levels and obesity levels in Alaska Native peoples aged 50 and over in urban and rural regions of Alaska, when considering self-reported loneliness and self-reported stress.

The literature review was unable to find studies that explicitly included older Alaska Native individuals and the effect that rurality (urban vs rural counties) had on their physical activities and obesity levels. Alaska is a vast state, and some Villages are only accessible via air or water even during the summer months, so ensuring that each Alaskan has access to affordable healthcare or indoor/outdoor facilities to be physically active may not be feasible. The literature review was also unable to locate any policies or programs that focus on this specific subpopulation, though in some Villages, Community Health Aid Practitioners (CHAP) staff provide wraparound care for all members of the Village, and some Tribal Associations do provide Elder Outreach programs but are not specifically focused on physical activity and obesity (ANTHC, 2025; CHAP, 2025).

However, there is a newer whole-health program hosted by the State of Alaska called Fresh Start: Free Programs for Better Health (State of Alaska, 2024b), which promotes greater levels of physical activity, regardless of age or location.

The researcher used multiple logistic regression to analyze the data collected by the CDC BRFSS. Rurality, as defined by the Health Resources and Services Administration, is split into two categories, urban and rural. Urban is a metropolitan area that has 50,000 people or greater, while rural is a metropolitan area that has 49,999 people or less (Health Resources & Services Administration, 2024; Rothwell et al., 2014).

Purpose of the Study

The purpose of this quantitative cross-sectional study using secondary data from BRFSS was to examine how rurality impacts physical activity levels and obesity levels in Alaska Native peoples aged 50 and over in urban and rural regions of Alaska. The independent variables are rurality (urban vs. rural counties), obesity level, physical activity level, sex, self-reported loneliness, and self-reported stress, and the dependent variables are the physical activity level and/or obesity level in this subgroup of Indigenous peoples.

The outcomes of this study could lead to a greater understanding of how location impacts Elders' aging in place and improve public health outreach programs for this population. Gaining a better understanding of what levels of community design (urban or rural) have a greater need may positively impact physical activity and obesity management programming and lead to greater partnerships between the State of Alaska

and Alaska Native Tribal Health Consortium and other partner agencies. This may also lead to additional CHAP training to include a greater focus on weight management when interacting with this population, greater levels of Elder Care programming provided by Alaska Native Consortiums / Corporations, and/or new advertising campaigns for the statewide Fresh Start effort to better entice this subpopulation to become a part of the program.

Research Questions and Hypothesis

RQ 1: What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, physical activity, and mediating for self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older?

H₀: There is no statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, and physical activity level mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

H_a: There is a statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, and physical activity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

RQ 2: What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, age, race, obesity level, and mediating for self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and

older?

H₀: There is no statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, age, race, and obesity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

H_a: There is a statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, age, race, and obesity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

Theoretical Framework for the Study

The framework for this study is rooted in the socio-ecological model (SEM) based on Bronfenbrenner's ecological systems theory (Meghani et al., 2023), which posits that an individual exists in the center of concentric rings of factors influencing the person ranging from individual, interpersonal, organizational, community factors, and up to public policy (Bronfenbrenner, 1977). Individual-level examples include age, health conditions, and level of physical mobility, as well as cultural food preferences and practices commonly found in this sub-population. Interpersonal-level examples could include family support networks within communities, elder-to-younger mentorships, and traditional Village gatherings. Community-level examples could include Village pedestrian infrastructure, locations to be physically active, and access to various types of transportation. Organizational-level examples could include statewide Tribal Health Organization programs, statewide Community Health Aide Program presence, and

regional Elder Care programs. Policy-level examples could include Tribal Corporations around Alaska, State of Alaska Health initiatives and programs, and Federal Indian Health Service (IHS) programming. Though SEM has five levels, individual, interpersonal, organizational, community factors, and public policy, this study only operationalized two levels of the SEM, the individual level and community level (rurality), by analyzing responses from a yearly phone survey administered in Alaska.

The researcher chose SEM over other models, such as the theory of reasoned action or the social determinants of health model, because it helped link the effects of rurality across the various rings of influence. Understanding the impact that rurality has on the individual, family, community, and other levels may help future public health practitioners create more efficient programs and/or policies for this underserved subpopulation. By using SEM in this study, she interpreted what impact rurality, self-reported loneliness, and self-reported stress have on obesity levels and physical activity levels through regional and state-level comparative analysis using BRFSS data collected via phone survey during the 2023 cycle. The SEM theory aligns with the research questions because the researcher sought to understand what impact various spheres of influence, such as community and organizational levels, have on Alaska Native Elder individuals experiencing obesity in Alaska.

A strength of the SEM theory is that it represents a complicated interplay between levels of influence that may be experienced by a person who is obese, such as how their family members and Village community may impact their everyday lifestyles. This could be useful looking ahead to new tailored physical activity and/or nutrition public health

programs in this subpopulation, especially for those Elders who wish to age in place in their Villages. This could also benefit existing programs in understanding what linkages exist within this subpopulation, so a more focused public health outreach can be established.

A limitation of this theory lies in the challenge of an individual making a positive social change in this often-complex chronic medical condition, such as getting greater amounts of physical activity. Applying the SEM theory may be limited in this subpopulation due to the community design they encounter in their everyday lives, such as poor weather, unsafe conditions, or lack of a location to be physically active (see Figure 1). This may impede their ability to change habits moving forward and continue to impact their levels of physical activity and obesity in their home Villages. However, this theory relates to the problem, purpose, and nature of the study because the researcher studied how rurality (urban vs. rural counties) affects obesity level and physical activity level when controlling for sex, obesity level, physical activity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older (Meghani et al., 2023).

Figure 1*Social-ecological Framework Applied in AI/AN Communities*

Harmony and Balance in Life: Applying the Social-Ecological Model in AI/AN Communities



Note. This figure illustrates the concentric rings of societal impact on an individual as described by the Indian Health Service’s Healthy Weight Model (IHS, n.d.).

Description of Literature Search

To search the literature for relevant articles and information on the topic of obesity in Alaska Native Elders and related information, the researcher searched MEDLINE (PubMed), Sage Journals, Science Direct, Walden University Library, EBSCO, Google Scholar, and conducted a multi-database search. She narrowed her search date range to 2019 through 2024, though she found foundational references from earlier decades by using a Boolean search strategy, refining her search subject combinations, and citation-chaining. The keywords searched included: *American Indian/Alaska Native or AI/AN or Alaska Native or “Alaska Native”, obese, obesity, high BMI, elderly, Elder, geriatric, older, aging, regions, Tribal, remote, rurality, community, Village, physical activity, exercise, walkability, nutrition, diet, traditional foods, and*

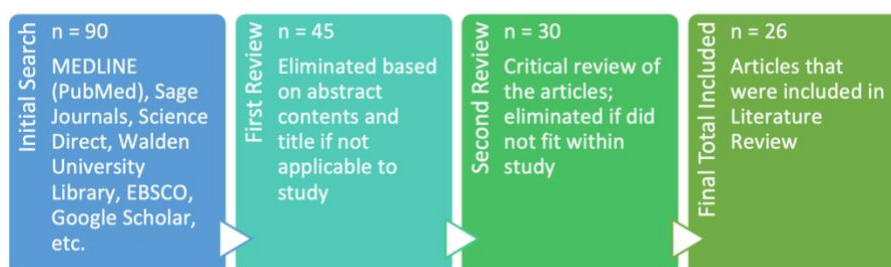
eating.

Through extensive research, she identified the study framework as the socio-ecological model based on Bronfenbrenner's ecological systems theory. Based on that model, she also expanded search keywords to include terms such as: *Bronfenbrenner, socio-ecological model, systems theory, development, ecology, older adult, aging in place, community design, and behavior theory*. The researcher also extended her search to other Indigenous and older populations in countries outside of the United States, such as those in Canada, Europe, Asia, and Australasia.

The researcher retrieved 90 articles based on the terms and phrases above, eliminated about half based on title and/or abstract contents, and reviewed the remainder. To narrow the broad article base down, she created a literature-search matrix using Excel that included key points from each article, a short article summary as a comparison of relevance to this intended study on rurality, obesity, and physical activity, and an age range, since she focused only on Native Elders. She also included notes on sample size, type of study (quantitative, qualitative, or mixed), study type (cross-sectional, meta-analysis, community-based participatory research, etc.), and location of study, which impacted the final total number of articles included in the literature review. Out of those 45 articles, she reviewed them in their entirety and eliminated a further 15 based on critical review, and out of the remaining 30, included 26 in the literature review as they pertained directly to the study. Figure 2 presented the steps taken to locate literature.

Figure 2

Literature Search Strategy



Priority Population

Alaska Natives are the Indigenous peoples from Alaska who live in urban and rural counties and are split up into 229 Federally Recognized Tribes across the state. This population lives in over 200 urban, rural, and remote communities, some of which are only accessible by plane or boat, depending on season (ANCSA Regional Association, n.d.; U. S. Department of the Interior, n.d.). Older adults, aged 50 and over, are considered by many Tribes to be Elders (Stanford Medicine, 2014); however, other research indicated that adults in this population who are looked up to for guidance by their peers may be considered Elders at any point. Yet, the typical age to receive benefits from a local health organization is about age 55 (Brooks-Cleator and Lewis, 2020).

In 2020, the prevalence of obesity in the Alaska Native/American Indian adult population was 48.1% versus the white adult population, which was 30%, which is concerning (U.S. Department of Health and Human Services, 2020). Higher levels of obesity in this population may be linked to a lack of infrastructure to perform physical activities, food deserts due to the higher price of imported foods for those who choose to eat a more Western diet, and/or lack of affordable healthcare in their local Villages. Other

possible complicating factors include the location of the Villages (on or off the road system), extreme weather patterns (melting sea ice and larger, stronger storms), safety concerns (lack of adequate lighting, lack of Village Public Safety Officers), generational trauma (Elders forced to give up their Traditional ways of life), and other sociodemographic factors such as lack of basic needs met (running water, indoor plumbing), etc. (Demientieff et al., 2023; Denny et al., 2005; Goins, et al., 2022; Hauser et al., 2021; Hirshberg & Sharp, 2005; Papadopoulou, 2003; Sequist, 2021; State of Alaska, 2023a).

Other studies have shown that an older-to-younger teaching method or mentoring has been successful in the past in sharing knowledge down through generations for things such as hunting, foraging, and other traditional practices, which can help younger adults stay healthy and continue to age in place (Demientieff et al., 2023; Walch et al., 2021). Very few publications detail this subset of the population, and future research is needed to better understand the interventions that will better suit future positive behavior change. This definition and interaction were helpful to the study because they indicate that there is a specific age range in this population that is considered “Elders” who can be integrated into future public health efforts and have a trickle-down effect in other parts of the population.

Aging in Place

The older adult population is continuing to grow and, according to the World Health Organization (2022), will double to over 2 billion people across the planet. In Alaska, this priority population is expected to increase by 60% to about 64,000 by 2050

(State of Alaska, 2024a). Aging in place is a common goal of older individuals from many cultures and regions and has been expressed specifically by Indigenous peoples worldwide, who may feel more connected to their land, families, and/or broader networks within their home communities (Gall et al., 2021). Research has shown that the community support experienced by Alaska Native people living in this region would be extremely helpful to continue their stated goal of aging in place (Lewis et al., 2014). These individuals value the teachings they can pass down to the next generation, sharing their knowledge of Traditional ways and spiritual well-being with younger community and family members. Targeted interventions for this priority population would be helpful in future public health efforts, especially if focused on physical health, mental well-being, and avoiding social isolation and loneliness in later years (Lewis et al., 2014).

Research has also highlighted Alaska Native Elders' views on growing older in Northwestern Alaska (Brooks-Cleator, 2020). This population wants to age in place with assistance from their immediate families, an extended Village or community member system, and a broader network of support from others nearby. Successful aging in place for this priority population may include continuing to either lead their communities or share Traditional knowledge and practices with the next generations, as well as continuing to be healthy both in body and mind. Supporting Elders by ensuring they continue to be mentally challenged, physically active, and socially connected is key to being able to age in place (Brooks-Cleator, 2020).

Determinants of Obesity

Obesity may be caused by a myriad of factors, including genetic influence, poor

eating, stress, sleep challenges, mental health issues, lack of physical activity, chronic diseases, medical treatment, the environment, or a combination of any of those things (Safaei et al., 2021). Social determinants of health (SDOH) may also play a role in overweight and obesity levels, in addition to the factors described above. Researchers have compared participants' obesity levels to their lived SDOH, such as their self-reported education level, the nearby built environment (community design/walkability), income level, social networks, health care access, and healthy foods (Javed et al., 2021). They found that individuals who experienced higher levels of SDOH also experienced higher levels of obesity and recommend integrating monitoring SDOH during regular healthcare visits to help establish and maintain support systems for individuals with co-occurring conditions.

Obesity as a Chronic Disease

Obesity can cause many long-term poor health outcomes such as heart disease, stroke, diabetes, muscle and joint issues, mental health challenges, sleep issues, many types of cancers, and can lead to dementia and/or Alzheimer's Disease (Ryan et al., 2021; Srivastava et al., 2021; Tam et al., 2020).

Obesity has also been studied as a multi-system inflammatory condition and has been found to heighten the effects of heart disease, diabetes, and other hormone changes. Living with these conditions may limit opportunities for physical activity, which may become a circular cause-and-effect, leading to increased weight. This circular sequence may then lead to chronic obesity across the lifespan and escalate the effects on individuals as they age. Researchers concluded that extreme obesity is on the rise and

may disproportionately affect minority populations, such as Alaska Native and American Indian people (Khanna et al., 2022).

Manson and Buchwald (2021) studied chronic diseases in Alaska Native Elders and American Indians aged 65 and older, including obesity, liver disease, respiratory disease, diabetes, cardiovascular disease, and many types of dementia. They explored the interconnectedness of these various diseases and the negative impact on the overall longevity of the individuals experiencing these chronic conditions. This study concluded that Alaska Native and American Indian voices should be at the table more as collaborators to share their lived experience and help shape future public health interventions for this priority population.

Physical Inactivity Versus Physical Activity in Older Adults

Physical inactivity is one of the leading causes of obesity, according to Whitfield et al. (2021), and can contribute to obesity, the development of chronic diseases and mental health disorders, declining brain health, premature aging, and healthy years lost (DiPietro, 2001). Research has been conducted on physical inactivity in adults in Armenia, including those in the 'retired' age range or over 60 years old. Much lower levels of physical activity were found in the retired age range, as well as in those with lower levels of education, in men, and were linked to the development of chronic diseases. The results of this baseline study indicate that there is a need to create interventions for this priority population and better observe the effects of the interventions moving forward (Tcymbal et al., 2020).

The CDC recommends that older adults get at least 150 minutes of activity per

week, along with weight training (muscle strengthening) and balance activities (2023b). Physical activities can include a mixture of Western and Traditional activities, such as light to moderate workouts like walking, running, snowshoeing, berry picking, or a combination of domestic work, such as foraging, cleaning the house, etc. Muscle strengthening can include lifting weights, hunting, using resistance bands, and balance exercises could include participating in Native sports or using a balance board at home (CDC; Redwood et al., 2009). Performing regular physical activity can be a protective factor against poor health as one ages, which may include delaying the development of Alzheimer's and dementia and reducing chronic diseases such as obesity, heart disease, high blood pressure, and high blood sugar (Musich, 2022; Teixeira, 2013).

Community Design Impact on Older Adults

Changing accessibility needs, safety concerns, adequate lighting, social networks, green spaces, availability of healthcare facilities, store locations, multimodal transportation networks, and places to be physically active can affect an older person's ability to continue to age in place. Age-friendly communities consider all those components in their planning and/or remodeling efforts to help support older adults into their golden years (AARP, 2023; Rural Health Information Hub, 2024).

Older adult (age 65 and up) preferences in both urban and rural community design were studied in northwest Germany, including 11 rural areas and 2 urban areas. The study reviewed sociodemographic variances including age, income, and education level, mobility preferences, and preferred features such as trails and sidewalks. Results of this study indicated that the older end of the surveyed adults were less active than their

younger counterparts, lower-income respondents were less mobile, and physical activity was less prevalent in the rural communities surveyed (Brüchert, 2021).

Walkability as a design component for communities is vital to ensure that all individuals can move safely, accessibly, and equitably through their space, regardless of age or ability. Researchers studied the intersection of walking and health in adults, especially in the context of livability and sustainability in neighborhoods. This study highlighted the connection between walking and longevity and linked walking with lower instances of mental health concerns in the older adult population. They found that communities and neighborhoods that prioritize pedestrian facilities, such as well-connected, safe, and accessible sidewalk systems, offered a greater opportunity for active transportation or physical activity and could contribute to decreased levels of chronic disease rates like obesity (Baobeid et al., 2021).

Interventions to Counter Obesity in Older Adults

Countering obesity in older adults is a national concern with large-scale guidelines issued by the U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, and includes recommendations for policy, systems, and environmental changes (U.S. Department of Health & Human Services, 2023). Their Midcourse Report found that physical activity may lead to older adults staying healthier longer, being able to age in place, and experiencing better well-being into their golden years. Further recommendations include changes to community design to promote walkability, systems change such as incentivizing exercise programs and inviting a broader range of individuals to participate in decision-making processes, and

intentionally including those with lived experience (U.S. Department of Health & Human Services, 2023).

The only statewide intervention the researcher could identify that had a focus on reducing obesity in the older adult population of Alaska was released in 2023, called Fresh Start: Free Programs for Better Health. This program was available for free or low cost across the state to support users via online or telephonic communication to promote physical activity as a protective factor against many chronic diseases. This program linked greater levels of physical activity to lowering obesity levels and possibly reducing many other chronic diseases such as heart disease, high blood pressure, high blood sugar, and stopping smoking and/or vaping. Most recently, it also included resources describing physical activity as a protective factor against developing dementia and Alzheimer's disease (State of Alaska, 2024b).

Social Ecological Model Theory Seen in Other Research

The Social Ecological Model theory had been used in other related studies such as a study by Gold et al. (2020), which explored how the SEM influenced positive social change on communities experiencing high levels of obesity in children in seven states in the United States. Interventions included those at the individual, family, community, and policy level, such as increasing knowledge, forming support groups, community coaching, and policy change. Results indicated while there was not a statistical difference in SEM levels of intervention, coaching did have a positive social impact on the communities and helped connect more siloed individuals and groups (Gold et al.).

Researchers studied how older individuals' independence was impacted by the

aging process and, by using the SEM, identified how resilience was a determining factor in successfully aging in place (Li et al., 2023). The study compared demographics, individual factors, family factors, community factors, and social factors of older adults collected via in-person interviews. Results indicated that individuals who experience chronic diseases were more prone to be less resilient, and the built environment also had a great impact on those older adults in the study (Li et al.).

Limitations, Challenges, and/or Barriers

Limitations the researcher encountered include the use of secondary data, potential inaccurate reporting, incomplete responses due to phone outreach during the COVID-19 pandemic, suppressed data due to the rurality of the individuals surveyed, and/or low sample size for the study. Limitations with using secondary data may have included inaccurate self-reporting by those individuals who answered the survey, such as with response bias and perhaps reporting higher levels of activity and/or lower levels of weight, etc., when asked by the survey staff. A limitation of using self-reported loneliness and self-reported stress was that there was only one question for each of those topics within BRFSS, and the validity and reliability of those responses are limited due to the questions only being in the BRFSS survey questionnaire for two cycles, since 2022.

Design limitations of the BRFSS survey of older individuals included that some respondents may be uncomfortable with phone surveys due to hearing loss, some may be experiencing cognitive decline or memory challenges, some may prefer paper surveys, and/or some may not speak English or Spanish. Inaccurate reporting and incomplete response due to phone outreach during the COVID-19 pandemic may be possible with

any recent survey, though BRFSS takes human error into account and, with scripts, data scrubbing, and weighting, tries to account for those errors. Suppressed data due to the location of the individual surveyed may have impacted this study since BRFSS does not report estimates with a low total number of respondents in regions and/or when the results are statistically unreliable (State of Alaska, 2024c).

Significance of the Study

This study was significant in that it could provide an understanding of a seldom-studied facet of Alaska's population: older Alaska Native people. It explored the potential linkage between rurality (urban vs. rural counties), physical activity levels, and obesity levels experienced by a disproportionately higher number of individuals in this subgroup. The findings could be useful for regional and hub community health workers who guide these individuals in staying healthy and being well into older age. The study addressed social determinants of health by advancing the needs of the many Alaskans who decide to age in place, and having this gap in literature filled could help clinicians develop more inclusive treatment plans moving forward.

Implications for policy change include increased support for an enlarged number of care staff in Alaska, increased Medicaid/Medicare funding for paid physical activities where available, increased funding for rural/remote development of pedestrian and bicycle infrastructure, and potential education for care staff in super-rural/remote communities on aging in place and best practices to care for Elders at the community level. The study could also impact outreach to other age-bracket Alaska Native individuals, such as those older but not yet considered Elder, or younger adults, and help

reallocate resources for self-management of weight and physical activity earlier in the life course. If there is no significant association between rurality, physical activity levels, and obesity levels in this population study, future programs could still refer to the study findings for forthcoming study ideas in other Indigenous peoples. This study contributed to literature by opening the avenue for more studies in this seldom-studied priority population, as older adults are projected to increase by 33% in the United States from 2020 to 2050 (Administration for Community Living, 2024), and preparing for that future wave is essential for public health practitioners and support staff as we move forward. Implications for positive social change of this study could be education for Community Health Aide Practitioners (CHAP) and other staff in regions with higher obesity and lower rates of physical activity, which could lead to longer, stronger, and healthier lives for Alaska Native Elders.

Definitions

Age: The self-reported age as of the surveyed person's last birthday, or calculated by subtracting the individual's date of birth from the date of survey (CDC, 2023a)

Loneliness: Loneliness is a negative feeling that can occur when a person's social network is reduced or fractured, either in number or in caliber, as can happen with adults as they age (Stegen et al., 2024).

Obesity Level: Body Mass Index (BMI) is the traditional measure of obesity level, measured by calculating weight divided by height squared (kg/m^2); a BMI of 30 or greater is considered obese (Fitch & Bays, 2025).

Physical Activity: Physical activity can include, but is not limited to, walking,

biking, swimming, gardening, home repair, sports, winter sports, and other activities, fishing, hunting, subsistence living, strength-training, and stretching activities (Willis et al., 2024).

Race: The self-reported race of the surveyed person, CDC BRFSS categories include White, non-Hispanic; Black, non-Hispanic; Asian, non-Hispanic; American Indian/Alaska Native, non-Hispanic; Hispanic; other race, non-Hispanic (CDC, 2025).

Rurality: Urban vs rural, with urban having 50,000 or more people living in the county and rural having less than 50,000 people living in the county (CDC, 2024). In Alaska, there are three urban areas with high enough populations to count as Urban: the Anchorage metropolitan area, the Fairbanks metropolitan area, and the MatSu Valley region.

Sex: For this study, sex was based on biological sex at birth via genital identification, i.e. males have testes, while females have ovaries; not based on gender orientation or societal perceived gender (DeCasien, 2022).

State: Respondents' state is part of the record identification section of the main survey, based on the Federal Information Processing Standard (FIPS) code; Alaska is 02 (United States Census Bureau., n.d.-d).

Stress: Stress is a chemical response that can occur when a person encounters a situation such as physical danger, mental agitation, or negative emotional events, which triggers unease or agitation; experiencing long-term stress can cause mental or physical decline (Valencia-Flores et al., 2023).

Assumptions

This study was performed on the Behavioral Risk Factor Surveillance System (BRFSS) data. Data was collected by state-level Department of Health interviewers, submitted to the CDC for validation and analysis, and published on the public-facing CDC website. By utilizing secondary data, the researcher assumes the questionnaires were conducted with competence, fidelity to the study model was upheld, submission to the CDC from state-level staff was conducted appropriately, and the responses were reliable and valid for use in this study. She also assumes that the study respondents answered the questions to the best of their ability at the time of response and that the surveyors documented their responses as accurately as possible.

Foundation of the Study and Literature Review Summary

The purpose of this quantitative cross-sectional analysis was to examine the relationship between the dependent variables of obesity and physical activity with the independent variables, which include rurality (urban vs. rural counties), sex, obesity level, physical activity level, self-reported loneliness, and self-reported stress. The study used multiple logistic regression to analyze the CDC BRFSS data collected during the most recent outreach cycle publicly available, from 2023. The literature review found works detailing the aging process, mental health, physical activity, obesity, and other related chronic diseases, community design, and interventions to counter obesity, but very little on how rurality impacts the two dependent variables (obesity levels and physical activity levels) in Alaska Native Elders.

To answer the two research questions the researcher proposed, she evaluated

secondary data obtained from BRFSS with a quantitative cross-sectional research design using multiple logistic regression. For this study, the dependent variables are physical activity and obesity level, while the independent variables are rurality (urban vs. rural counties), sex, obesity level, physical activity level, self-reported loneliness, and self-reported stress.

Section 2: Research Design and Data Collection

The purpose of this quantitative study was to examine if there was a relationship between rurality (urban vs. rural counties) and levels of physical activity and obesity in Alaska Native Elders, aged 50 and over. The study also considered the independent variables of rurality (urban vs. rural counties), sex, obesity level, physical activity level, self-reported loneliness, and self-reported stress, depending on the Research Question. The significance of this study lay in the uniqueness of the research planned. While there was literature on the impacts of physical activity on obesity across the lifespan, there was very little on this subpopulation (Alaska Native Elders, aged 50 and over, residing in Alaska). There had been studies on walkability, community design, comorbid conditions related to obesity, older adults' aging process, preference for aging in place, mental health, and interventions to combat obesity, but little was found on the impact that rurality may have on this subpopulation. This study was significant because of the rapidly increasing number of older adults in Alaska, specifically in this subpopulation, who wish to remain in their home communities and age in place as long as possible.

The results of this study could be used to guide public health efforts across Alaska for this subpopulation, with a focus on those regions with higher levels of obesity and/or

lower levels of physical activity. The study could shape culturally appropriate outreach into communities identified as including a proportionally higher number of older adults, with specific partnering between the State of Alaska public health programs, regional Tribal entities, Village hub hospitals, and local health organizations to ensure that these older adults are cared for during their Elder years. By providing support and care to these older adults, communities can come together to learn from the Elders as their cultural beliefs and traditions are typically passed down through hands-on learning, help keep the Elders more physically active, reduce overweight and/or obesity, decrease feelings of social isolation and/or loneliness, and potentially slow mental health decline.

Study Design and Rationale

This study was a quantitative cross-sectional examination of a single year of the CDC BRFSS data from 2023. This year was chosen because it was the most recent completed dataset available for use. Though the sample size may be low based on the narrow scope of the study design, appropriate statistical adjustments, such as pooling across multiple years, could be done to ensure an appropriate number of responses are included in the study. The dependent variables were the level of obesity and the level of physical activity, while the independent variables were rurality (urban vs. rural counties), obesity level, physical activity level, sex, self-reported loneliness, and self-reported stress, depending on the research question.

The researcher used a cross-sectional research approach given that the dataset was from the single year 2023 and had responses from 5,525 Alaskans before analysis (CDC, 2024). The cross-sectional approach to this study was appropriate because she examined

a single data source collected from a selection of participants in a yearly national survey. She used a quantitative study design to identify relationships between the independent variables and dependent variables in the dataset to determine if the hypothesis of rurality impacting levels of physical activity and obesity in this subpopulation was a statistically significant finding. A strength of this type of study was that it can be used to analyze multiple variables at one time, such as those independent variables listed above. One limitation of this study design was that it could not cross-compare years of data to determine trends or assess datasets for causality, for example, if obesity affects rurality or if rurality affects physical activity (Maier et al., 2023). Another limitation of this study was the potentially low sample size due to the narrow scope of the study design (Alaska Native Elders, aged 50+), which could have necessitated future pooling of responses across years.

Data Source

To perform this study, the researcher utilized the 2023 dataset from the CDC BRFSS, which contains the most recent responses from the telephonic survey of Alaskans aged 18 and over. BRFSS originally started in 1984 as a telephone-only survey in 15 states but has since expanded to all 50 states, Washington, DC, and all three U.S. territories, and is currently conducted via landline and cellular phone. The survey collects data on more than 430,000 adults per year to track chronic disease, health risk behaviors, healthcare access, etc. in a representative sample that can be examined at the national, state, and local levels. The survey contains three sections: core components, optional modules, and state-added modules with questions related to demographics, current health

status, behaviors, social determinants of health, cancers, health equity, cognitive decline, etc. BRFSS questions are scripted, and some include question probes if the respondent is unclear or unable to answer, though most questions include a refused option if needed.

The sample size for Alaska has increased consistently in the last 6 years to almost double the 2018 total of about 2,750, with almost 5,500 respondents in 2021; the researcher hoped the 2023 number was at that or greater, especially due to the narrow scope of the study. She chose this survey because it asks specific questions of the respondents to calculate BMI via approximated height and weight, their location via zip code to determine rurality (urban vs rural counties), their age, their sex, their self-reported loneliness, and their self-reported stress. Since this was a secondary data analysis, the CDC BRFSS staff used weighting and ranking to reduce errors in estimates and random-digit-dialing on rotation to reduce the occurrence of duplicate responses over the years. However, some data may be suppressed due to a lack of respondents in communities or regions.

Since BRFSS collects data that was self-reported by survey recipients, there was a chance for bias to be introduced into the sample dataset. To mitigate this, BRFSS staff calls equally during months of the year to reduce seasonal variation, such as hunting season or deep winter season, and skips questions that do not apply to individual respondents using the provided decision prompts. BRFSS staff also review or remove responses outside the realm of possibilities, such as extreme body weight or age, and heavily script interviews for standardization of administration across the population surveyed.

Population

The priority population for this study was Alaska Native Elders, aged 50 and over, residing in Alaska. As of the 2022 American Community Survey, the total population of Alaska was about 733,000, and the number of individuals who were aged 50 and over at the time of the survey was around 231,000, or approximately 31%, of the total population (U.S. Census Bureau, n.d.-a). When searching deeper into Census data, she found that about 125,000 Alaskans claim Tribal descent, and of those, about 33,000, or 5%, are over the age of 50 (U.S. Census Bureau, n.d.-b), and therefore eligible to be included in a secondary study of BRFSS response data, if their primary phone number was selected for a survey.

Sampling and Sampling Procedure

Alaska's BRFSS program uses random-digit-dialing on rotation to survey the population each year, on both landline and cellular numbers. The state is divided into seven public health regions: Anchorage, Gulf Coast, Interior, Mat-/Su, Northern, Southeast, and Southwest, and contact numbers are selected from groups in each region. To ensure coverage of as much of the state as possible, calls are made multiple times per day, seven days per week, and when a call is answered, an adult (person aged over 18) is asked to respond to the survey. The program considers a cellphone user to be the primary respondent for that phone number, while a household self-selects a participant when answering the call. Additionally, unlisted numbers are also included in the pool of numbers to randomly dial, which increases the generalizability of the sampling across the state. Inclusion criteria were only adults over the age of 18; there were no exclusion

criteria that the researcher was aware of from the surveyor side.

To gain access to the CDC BRFSS dataset, she navigated to their public-facing website named “CDC BRFSS, 2023 BRFSS Survey Data and Documentation”. This website included an overview of the dataset, the BRFSS Codebook, data files, details on calculated variables, complex sample weight information, and other related resources. To the researcher’s knowledge, no IRB or DUA was required to access the dataset.

The variables that CDC BRFSS collected, which were used in the study, were obesity level BMI5CAT, physical activity level EXERANY2, urban vs rural counties URBSTAT, race IMPRACE, age AGE5YR, sex SEXVAR, state STATE, self-reported loneliness SDLONELY, and self-reported stress SDHSTRE1. This data was collected in the last cycle, so a cross-sectional analysis should be possible.

One limitation of this data was the sampling of BRFSS across Alaska, making it generalizable across the state but not oversampling for Alaska Native individuals. To counter this, the researcher filtered the data based on their race, age, and urban vs rural counties to establish rurality levels. The Alaska BRFSS program also utilized the CDC method of data weighting/iterative proportional fitting or “raking,” which better represented the population of Alaska based on the variables she intended to use for identification of data for the study. This raking method ensured that under-represented groups such as Alaska Native Elders were proportionally included in the study.

Another limitation was the newer Social Determinants of Health and Equity module that was added to the yearly questionnaire in 2022. This module includes the questions the researcher included in the study’s variables for self-reported loneliness

(“How often do you feel lonely?”) and self-reported stress (“Within the last 30 days, how often have you felt this kind of stress?”). Both were Likert scale responses, with a range of *never to always*, with an option for *don’t know/not sure* and *refused* (CDC, 2025). Since these questions were only on the last two BRFSS questionnaires (2022 and 2023), the validity and reliability of the responses from this priority population, Alaska Native Elders aged 50 and over, could be questioned. It should be noted that 36 states, including Alaska, were using this module to address Social Determinants of Health and Health-Related Social Needs in their communities via the BRFSS survey method. These two questions were part of a larger module that addresses topics such as employment stability, life satisfaction, food and housing security, and transportation access (Hacker et al., 2024).

A third limitation was the possibility of social desirability bias in the BRFSS respondents. Social desirability bias occurs when the respondent answers what they think the surveyor might want to hear, as opposed to providing their own lived experience, self-reporting, or a personal response to the questions. This could be especially muddying for questions such as those related to social determinants of health in the BRFSS questionnaire above. This bias could become a problem if both the independent variable and dependent variable are contaminated with social desirability, though if only one of the variables is contaminated, it does not present such a threat to the validity and reliability of the questions (Kwak et al., 2021).

A fourth limitation was the possibility of othering this subpopulation by not acknowledging the poor practices that historically impacted American Indian and Alaska

Native peoples, and which continues to impact this population with generational trauma still felt today (Demientieff et al., 2023). Othering was the practice, intentional or unintentional, of racism and/or bias against the American Indian/Alaska Native population, which may misinform data collection, mislead analysis, and influence results. Indigenous peoples should be included in all data collection, and the BRFSS process does its best to disaggregate data with both the random-digit-dialing on rotation strategy to include as many representative sample individuals and the effort to rake and adjust the dataset post-collection (Tavo & Sivulliuqti, 2022).

Despite these limitations, this dataset was best suited for this study because it used a random sample of Alaskan responses from across the state, which is based on public health regions, and includes landline, cellular, and unlisted numbers for random digit dialing. The questionnaire used for the 2023 BRFSS data collection contained all the elements in the research questions, which made it the best source for the study. A power analysis with an anticipated medium effect size ($d = 0.3$), power level of 0.80, and alpha level of 0.05 was run, resulting in a minimum sample needed of 84 participants per region. Accounting for 20% missing data increases this to 101 participants per region, for a total minimum sample of 202 responses from Alaska.

Variables and Definitions

BRFSS staff collected data from landline and cellular telephone surveys of Alaskans during the 2023 survey year. This data included state, self-reported age, sex, race, obesity level (calculated from self-reported height and weight without wearing shoes), physical activity level, level of loneliness, and level of stress. In this study,

obesity level and physical activity level were either independent variables or dependent variables, depending on the Research Question, while independent variables were rurality (urban vs. rural counties), sex, self-reported loneliness, and self-reported stress. Age and race were only used to filter the data prior to analysis, after filtering to include only Alaska-specific responses. This data was used to evaluate how rurality impacts the level of physical activity and obesity level when controlling for sex, physical activity level, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

Age (AGEG5YR)

Respondents' ages are self-reported via phone survey with a range between 18 and 70, and 80 or older. Respondents are also able to answer with a response of Don't Know/Not Sure and Refused, and there is a category for Missing (Centers for Disease Control & Prevention, 2024). This variable was used only to select cases.

Obesity Level (BMI5CAT)

Respondents' obesity level is calculated for reporting with the self-reported weight without shoes and height without shoes. Weight may be reported in pounds or kilograms, and height may be reported in either feet/inches or meters/centimeters; respondents may also be able to answer with a response of Don't Know/Not Sure and Refused. Obesity is broken into four categories of BMI: Underweight, <18.5, Normal 18.5 - <25.0, Overweight 25.0 - <30.0, and Obese 30.0+ (Centers for Disease Control & Prevention, 2024).

Physical Activity Level (EXERANY2)

‘During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for Exercise?’ was used to gauge respondents’ participation in physical activity outside their regular job and was self-reported with a response of Yes, No, Don’t Know, Missing, and Refused (Centers for Disease Control & Prevention, 2024).

Race (IMPRACE)

Respondents’ race was self-reported with 4 individual races: White, Black, Asian, and Hispanic; though American Indian and Alaska Native are combined, and there is a further field including ‘other races, non-Hispanic’. In this study, the researcher used ‘American Indian or Alaska Native only, non-Hispanic’. (Centers for Disease Control & Prevention, 2024). This variable was used only to select cases.

Self-reported Loneliness (SDLONELY)

The question: ‘How often do you feel lonely? Is it...’ was used to gauge respondents’ self-reported feeling of loneliness. Responses were categorized using 5 levels, from Always to Never, and respondents were also able to answer with a response of Don’t Know/Not Sure, and Refused, with a further category for Not Asked or Missing (Centers for Disease Control & Prevention, 2024).

Self-reported Stress (SDHSTRE1)

The prompt ‘Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time’ along with the question ‘Within the last 30 days, how often have you felt this kind

of stress?’ was used to gauge respondents’ self-reported stress levels. Responses are categorized into 5 levels, from Always to Never, and are also able to answer with a response of Don’t Know/Not Sure, and Refused, with a further category for Not Asked or Missing (Centers for Disease Control & Prevention, 2024).

Sex (SEXVAR)

Respondents’ sex was categorized as only male or female, with no other options and no other responses (Centers for Disease Control & Prevention, 2024).

State (_STATE)

Respondents’ state is part of the record identification section of the main survey, based on the Federal Information Processing Standard (FIPS) code; Alaska is 02 (United States Census Bureau., n.d.-d). This variable was used only to select cases.

Urban Status (_URBSTAT)

The urban-rural split variable was the most granular she could use for this population, given the narrow scope of the study (state: Alaska, race: Alaska Native, age: 50 and over) and regions with extremely low populations. This response is based on the National Center for Health Statistics (NCHS) Urban–Rural Classification Scheme for Counties from 2001, originally based on the Office of Management and Budget standard county scheme established in 1990. This variable allows for two responses by BRFSS: Urban counties or Rural Counties, with a other options as Not Defined or Missing. Rurality can be classified as urban (population > 50,000) or rural (population < 49,999). (CDC, 2024; Health Resources & Services Administration, 2024; Rothwell et al., 2014).

Data Analysis Plan

Software

The researcher used the International Business Machines Statistical Package for Social Sciences, or IBM SPSS, Version 30 for Mac, to analyze the data retrieved from the CDC BRFSS program's public-facing website.

Data Cleaning and Screening

Raw datasets were available by downloading from the CDC's BRFSS public-facing website. Once the researcher downloaded the data, she initially eliminated the unneeded states and territories to focus on the 5,525 responses specific to Alaska, out of the approximately 433,000 total responses (CDC, 2024). She then eliminated those variables that were unneeded, such as tobacco use or cancer treatment, etc., to focus specifically on the Independent Variables and Dependent Variables for analysis, which included only state, self-reported age, sex, race, obesity level (calculated from self-reported height and self-reported weight without wearing shoes), physical activity level, level of self-reported loneliness, and level of self-reported stress.

Handling Missing Data

Missing data from respondents could have resulted in imputing the missing values or deletion of the entire response, depending on the amount of missing data points per respondent. The researcher considered regression imputation to replace the missing data with estimated values based on the probable prediction, but she consulted with BRFSS and Walden's Stats Team further on how they handle missing data at the state level and did not.

Research Questions and Hypotheses

RQ 1: What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, physical activity, and mediating for self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, and physical activity level mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, age, race, and physical activity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

RQ 2: What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, age, race, obesity level, and mediating for self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, age, race, and obesity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs.

rural counties) and physical activity level when controlling for sex, age, race, and obesity level, mediated by self-reported loneliness and self-reported stress among Alaska Native adults aged 50 and older.

Data Analysis Plan with Statistical Tests

The Research Questions went through some revision during the early data analysis process, based on consultation with Capstone Methodology Advising staff at Walden University. The first part of our discussion was focused on the variables of race and age; Dr. Ozcan recommended that the researcher drop both since they were descriptors of the study population and were not needed for the analysis (A. Ozcan, personal communication, March 2025). She consulted with her Co-Chair, Dr. Osoba, and received approval to use those only as descriptors instead of as part of the research questions (T. F. Osoba, personal communication, April 2025).

Further discussion was centered on the ‘mediation’ of self-reported loneliness and self-reported stress in the original RQs; Dr. Htway recommended they would better fit as additional independent variables (Z. M. Htway, personal communication, April 2025). The researcher ran these additional changes past her Co-Chair, Dr. Osoba, and she approved based on these revisions clarifying methodology and confirmed they were within scope and technically sound (T. F. Osoba, personal communication, April 2025). The revised RQs and hypotheses are as follows:

RQ 1: What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

RQ 2: What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

The researcher started the analysis by performing a descriptive statistical analysis to determine the mean, median, mode, frequencies, percentages, standard deviations, and ranges for all her variables, followed by cross-tabulations using the urban vs. rural

counties variable. This analysis established a summary of the dataset, identified if there are outliers in the independent variables, and determined further testing.

The researcher moved to bivariate analysis, which included chi-square tests for categorical variables, t-tests/ANOVA for continuous variables, and correlation analysis for continuous relationships. She then moved to multiple logistic regression analysis, which followed a stepwise approach, with separate models for obesity and physical activity as outcomes, incorporating demographics, rurality, physical activity or obesity (depending on the model), and loneliness/stress in successive steps, followed by testing of interaction terms.

There were basic assumptions for each level of testing the researcher performed, such as homogeneity of variance, linearity, normality, and multicollinearity, which determined the next level tests she performed on the data. Normality assumes the continuous variables fall along a typical bell curve, linearity refers to the relationship between the independent and dependent variables, homogeneity of variance assumes all groups have the same or similar variances, and multicollinearity would indicate that several variables are correlated.

Multiple logistic regression fit this study best because this analysis helped me understand the relationship between the dependent variables of physical activity and obesity, and the independent variables of rurality (urban vs. rural counties), obesity level, physical activity level, sex, self-reported loneliness, and self-reported stress, depending on the research questions.

Multiple logistic regression also allowed me to see which individual independent

variables affected the dependent variables in this study. Interaction effects could occur when checking for multiple dependent variables' effects on the independent variables. If this were the case, further SPSS analysis could have included following the ANOVA test with a Simple Effects Test or MANOVA test to determine statistical significance.

Rationale for Covariates

The researcher chose the covariates sex, physical activity level, obesity level, self-reported loneliness, and self-reported stress because they may impact the dependent variables (physical activity level and obesity level) when investigating the association with rurality (urban vs. rural counties). The population she studied was older Alaska Native Elders residing in Alaska, so including age and race to eliminate those not Alaska Native and those younger than age 50 is appropriate.

The researcher chose to include physical activity levels and obesity levels in this study because there have already been linkages demonstrated between those three covariates (Hoseini et al., 2022). Including self-reported loneliness and self-reported stress was appropriate for this study because these two risk factors wax and wane over time, depending on age, could be impacted by the size of the community or region one lives in, and have been shown to impact levels of physical activity and obesity (Umberson et al., 2022; Zhou et al., 2024).

Assumptions and Testing

When performing a multiple linear regression in SPSS, there are eight assumptions that should be met: continuous dependent variable, two or greater independent variables, independence of observations, linear relationships,

homoscedasticity, multicollinearity, no outliers, and normal distribution. This assures us that there is a linear relationship, that the observations are not correlative, and that the model will be evenly distributed. To do this, the researcher performed a Pearson chi-square to test the goodness of fit as well as a complex sample crosstab procedure to test the F-ratio, and a Coefficient to determine the significance of the model. Results were interpreted to quantify the cause-and-effect: does community design affect physical activity and/or obesity levels in this subpopulation?

Interpretation of Results (Significance Levels)

Significance levels for this type of test were if the coefficient p -value is at 0.05 or less, meaning she could reject the null hypothesis and find that rurality statistically impacts physical activity level and/or obesity levels in Alaska Native Elders.

Threats to External Validity

The BRFSS survey variable the researcher used for sex was not updated to include any responses other than male or female, which may make some of those responses unusable if the individuals answered outside those parameters. Some of the questions were personal, such as the respondents' weight or height without shoes, and may collect inaccurate data. The survey was only conducted in English or Spanish, so individuals primarily speaking a different language may not be included within the survey respondents. Additionally, there were no accommodations within the BRFSS methodology to account for cultures that differ from White and may misrepresent marginalized populations such as Alaska Native individuals or People of Color (López-Cevallos et al., 2023).

Threats to Internal Validity

This survey was performed in 2022 during the COVID-19 pandemic, which might have resulted in fewer survey respondents. In the fall of 2022, Typhoon Merbok impacted Western Alaska, which resulted in at least 35 remote Alaska Native communities within the region being cut off from communication and may have impacted the response rate during the survey administration. The number of respondents for this survey may also be a limitation since the population of Alaska is already small, BRFSS responses are low, and this sub-population (narrow scope of age and race) may reduce the sample size even further. The researcher did not find a mechanism for BRFSS staff to survey Alaskans who speak a language other than English or Spanish, which may be another limitation if those older adults prefer to speak in one of the at least 20 Native languages around Alaska (University of Alaska Fairbanks, n.d.).

Also, due to the nature of the survey and the age of the respondents, opinions about sharing personal information with researchers and/or recall bias may come into play for some of the longer questions, such as, “Within the past 30 days...” or direct questions such as “How often do you feel lonely? Is it...”. Non-response bias or social-desirability bias was also possible due to this being a phone survey model and was acknowledged; data that was statistically unstable would be flagged by BRFSS staff (Kim & Choi, 2019; Centers for Disease Control & Prevention, 2024).

Ethical Procedures

BRFSS data was collected by trained professionals in each state on a yearly basis, submitted to the CDC for cleaning and tabulation, and published by CDC staff to the

public-facing website for scholars to access for studies. The CDC BRFSS website included an overview, BRFSS Codebook, data files, details on calculated variables, complex sample weight information, and other related resources. No personal identifying information, such as phone numbers or names, was included in the dataset, codebook, or accompanying documents. To download the CDC BRFSS dataset, the researcher accessed their public-facing website called the Centers for Disease Control & Prevention Behavior Risk Factor Surveillance System, 2023 BRFSS Survey Data and Documentation, which can be found here: https://www.cdc.gov/brfss/annual_data/annual_2023.html. She downloaded all pertinent data and documentation, saved the files to her password-protected personal laptop, and used the dataset download solely for this study. She applied for the Walden IRB for the study; to the researcher's knowledge, no IRB or DUA are required to access the BRFSS dataset.

Table 1

Variables, Variable Types, and Measures

Variable	Variable type	How the variable is measured
Obesity Level	IV (RQ2) / DV (RQ1)	Nominal
Physical Activity Level	IV (RQ1) / DV (RQ2)	Nominal
Age	IV	Nominal
Race	IV	Nominal
Sex	IV	Nominal
Loneliness	IV	Ordinal
Stress	IV	Ordinal
Urban vs Rural	IV	Nominal
State	IV	Nominal

Summary

The purpose of this quantitative study was to examine if there was a correlational

relationship between the independent variable rurality (urban vs rural counties) and levels of physical activity and obesity in Alaska Native Elders aged 50 and over, while controlling for the independent variables of rurality (urban vs rural counties), sex, obesity level, physical activity level, self-reported loneliness, and self-reported stress. To do this, the researcher performed a Pearson chi-square to test the goodness of fit as well as complex sample crosstab procedure to test the F-ratio, and a Coefficient to determine the significance of the model. Results were interpreted by examining the odds ratio to quantify the cause-and-effect: does community design affect physical activity and/or obesity levels in this subpopulation?

Section 3: Presentation of the Results and Findings

This research examined the factors influencing obesity and physical activity levels in Alaska Native Elders aged 50 and over, such as the effects of residing in Alaskan communities in rural and urban counties, sex, physical activity level, obesity level, self-reported loneliness, and self-reported stress. The study hypothesized that there was no statistical association between urban versus rural counties when considering the impact on physical activity and obesity levels in this population when controlling for sex, physical activity, obesity, self-reported loneliness, and self-reported stress. The RQs and hypotheses were:

RQ 1: What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H_0 : There is no statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a : There is a statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

RQ 2: What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported

loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H₀: There is no statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a: There is a statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

Accessing the Data Set for Secondary Analysis

This analysis was performed on the BRFSS data from 2023. Walden IRB approval was granted on February 4, 2025 (approval no. 02-04-25-1176432), and the data were accessed by downloading the public-facing BRFSS dataset on the CDC 2023 BRFSS Survey Data and Documentation webpage (CDC, 2025). These data were not missing a significant number of cases per variable, so no imputation or replacement was required to analyze the sample dataset.

Baseline Descriptive and Demographic Characteristics

Alaska's BRFSS program used random-digit-dialing on rotation to survey the population each year, on both landline and cellular numbers. The state was divided into seven public health regions: Anchorage, Gulf Coast, Interior, Mat-/Su, Northern, Southeast, and Southwest, and contact numbers are selected from groups in each region.

To ensure coverage of as much of the state as possible, calls were made multiple times per day, seven days per week, and when a call is answered, an adult (person aged over 18) is asked to respond to the survey. The program considers a cellphone user to be the primary respondent for that phone number, while a household self-selects a participant when answering the call.

For RQ 1, the dependent variable in this study was obesity level (BMI), and the independent variables were physical activity level, sex, rurality (urban vs. rural counties), self-reported loneliness, and self-reported stress. For RQ 2, the dependent variable in this study was physical activity level, and the independent variables were obesity level (BMI), sex, rurality (urban vs. rural counties), self-reported loneliness, and self-reported stress.

SPSS Version 30 was used to analyze this data, which was downloaded and saved to the researcher's personal laptop protected by a password. There was a total of 443,323 cases in the original 2023 BRFSS dataset. After applying Select Case to the dataset to include individuals only residing in Alaska, cases from individuals only aged 50 and older, and cases from individuals only identifying as American Indian/Alaska Native, Non-Hispanic, she was left with 360 cases for analysis.

The researcher deleted extraneous variables and was left with the core set for the analysis, including obesity level, physical activity level, urban/rural status (urban vs. rural counties), sex, self-reported level of loneliness, and self-reported level of stress. State, age, and race were used as part of the filtering process for SPSS, but were not used in her analysis since the analysis was focused on Alaska Native Elders, aged 50 and over, living in Alaska. She recoded responses to the two Social Determinants of Health questions

“How often do you feel lonely?” (CDC, 2024) and “How often have you felt this kind of stress?” (CDC, 2024) from Likert scale 1-5 *Always* to *Never* to 1-5 *Never* to *Always* to match the more commonly used Likert scale design (James Madison University, n.d.).

Descriptive statistics were performed, and among those 360 cases, approximately 3% of the respondents were underweight, 23% of the respondents were normal weight, about 35% were overweight, and 39% of the respondents were obese. Approximately 60% of the respondents lived in urban counties, and about 40% lived in rural counties. Approximately 53% of the respondents were female, while 47% of the respondents were male. Almost 68% of the respondents indicated they did get physical activity or exercise in the last 30 days, while about 32% of the respondents indicated they did not.

Approximately 40% of the respondents indicated they never felt stress in the last 30 days, about 32% of the respondents indicated they rarely felt stress in the last 30 days, 19% of the respondents indicated they sometimes felt stress in the last 30 days, 6% indicated they rarely felt stress in the last 30 days, and 4% indicated they always felt stress in the last 30 days.

About 37% of the respondents indicated they never felt lonely in the last 30 days, 37% of the respondents indicated they rarely felt lonely, 31% of the respondents indicated they rarely felt lonely, 26% of the respondents indicated they sometimes felt lonely, 3% of the respondents indicated they usually felt lonely, and 3% of the respondents indicated they always felt lonely. Frequencies and percentages are in Table 2.

Table 2*Frequencies and Percentages*

Variable	Responses	Frequency	Percent
Computed body mass index categories	Underweight	9	2.7%
	Normal Weight	78	23.4%
	Overweight	116	34.7%
	Obese	131	39.2%
Urban/rural status	Rural counties	143	40.4%
	Urban counties	211	59.6%
Exercise in the past 30 days	Had physical activity or exercise	242	67.8%
	No physical activity or exercise in the last 30 days	115	32.2%
Sex of respondent	Male	169	46.9%
	Female	191	53.1%
How often have you felt this kind of stress?	Never	122	39.4%
	Rarely	98	31.6%
	Sometimes	59	19.0%
	Usually	18	5.8%
	Always	13	4.2%
How often do you feel lonely?	Never	116	36.8%
	Rarely	100	31.7%
	Sometimes	82	26.0%
	Usually	9	2.9%
	Always	8	2.5%

The researcher also ran mean, median, mode, standard deviations, and ranges for all the variables, and found no outliers in the dataset. Of the 360 respondents, 334 provided height and weight for their computed BMI, and 354 provided their zip code for urban and rural status cross-reference. A total of 357 shared their exercise history for physical activity level, all 360 respondents shared their sex, 310 responded to the newer SDOH stress question, and 315 responded to the newer SDOH loneliness question. Mean, median, mode, standard deviations, and ranges are in Table 3.

Table 3*Mean, Median, Mode, Standard Deviation, and Range*

	Computed Body Mass Index categories	Urban/ rural status	Exercise in the past 30 days	Sex of respondent	How often have you felt this kind of stress?	How often do you feel lonely?
N Valid	334	354	357	360	310	315
Missing	26	6	3	0	50	45
Mean	3.10	1.60	1.32	1.53	2.04	2.03
Median	3.00	2.00	1.00	2.00	2.00	2.00
Mode	4	2	1	2	1	1
Std. Deviation	.851	.491	.468	.500	1.094	.987
Range	3	1	1	1	4	4

Bivariate Analysis

BRFSS is a complex telephone and cellphone survey undertaken yearly by the CDC, which means a complex analysis should be undertaken to analyze the dataset. BRFSS processing of the state-level data includes weighting procedures to ensure a proportional rate of cellphone and landline phone responses were included in the final dataset. Prior to 2011, BRFSS only stratified on age, sex, and region; after 2011, BRFSS includes a raking process for up to 16 margins, including but not limited to: race or ethnicity, region by age group, county by sex, etc. This raking process produces the design weight LLCPWT, which is then used by researchers to create a complex sample plan (CDC, 2025).

The researcher spoke with the BRFSS program lead at the State of Alaska and confirmed that, due to BRFSS's complex sampling design, a complex analysis would need to be performed using SPSS (J. Barnett, personal communication, March 2025). The first step in the data analysis was to build a complex sample analysis (CSA) plan to

properly weight the dataset, so the researcher created the CSA plan in SPSS using the Analysis Preparation Wizard and applied it to the dataset. The CSA plan included one stage with the strata variable @_STSTR, the cluster variable @_PSU, and the weight variable @_LLCPWT. The researcher spoke with Dr. Banerjee and confirmed that this CSA plan was appropriate for the study using the stage analysis above (S. Banerjee, May 2025). This made stratification, clustering, and weighting possible and allowed for generalization across the population (Lu & Yang, 2022).

To help understand if there was a relationship between the dependent variable obesity level and the individual independent variables (physical activity level, sex, urban vs. rural counties, self-reported loneliness, and self-reported stress), and between the dependent variable physical activity level and the individual independent variables (obesity level, sex, urban vs. rural counties, self-reported loneliness, and self-reported stress), the researcher performed an assumption assessment to check for correlation and complex sample crosstab test of independence. VIF results for the predictors were all below 10; for RQ1 urban/rural status was 1.011, exercise in the last 30 days was 1.004, sex of respondent was 1.019, self-reported stress was 1.427, and self-reported loneliness was 1.455, and for RQ2 urban/rural status was 1.012, computed body mass index was 1.017, sex of respondent was 1.029, self-reported stress was 1.428, and self-reported loneliness was 1.450, signifying no multicollinearity.

Results of the crosstab test of independence for RQ 1 [What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native

adults aged 50 and older?]) revealed no significant association between the dependent variable BMI (computed body mass index) and three of the independent variables (physical activity level (exercise in the past 30 days), sex, and urban/rural status), with all significance levels well above 0.05. However, there was a significant relationship detected between BMI level and stress with an Adjusted F of 2.602 and a significance level of 0.008, as well as a relationship between BMI level and loneliness with an Adjusted F of 2.404 and a significance level of 0.018. Results of the crosstab test of independence for RQ 1 are in Table 4.

Table 4

RQ 1 Crosstab

		Tests of Independence				
		Chi-Square	Adjusted F	df1	df2	Sig.
Urban/rural status *	Pearson	9.187	1.613	2.976	987.969	.185
computed body mass index categories	Likelihood Ratio	9.608	1.687	2.976	987.969	.169
Sex of respondent *	Pearson	11.524	1.868	2.942	976.742	.135
computed body mass index categories	Likelihood Ratio	11.737	1.902	2.942	976.742	.129
How often have you felt this kind of stress * computed body mass index categories	Pearson	49.215	2.602	7.825	2597.746	.008
	Likelihood Ratio	52.944	2.799	7.825	2597.746	.005
How often do you feel lonely? * computed body mass index categories	Pearson	50.198	2.404	7.122	2364.478	.018
	Likelihood Ratio	50.724	2.429	7.122	2364.478	.017
Exercise in past 30 days *	Pearson	1.385	.201	2.940	975.940	.893
computed body mass index categories	Likelihood Ratio	1.380	.200	2.940	975.940	.893

The adjusted F is a variant of the second-order Rao-Scott adjusted chi-square statistic. Significance is based on the adjusted F and its degrees of freedom.

The crosstab analysis of RQ 2 [What is the association between rurality (urban vs. rural counties) and physical activity level (exercise in the past 30 days) when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?], revealed no significant association between the dependent variable, physical activity level (exercise in the past 30 days), and the independent variables (obesity level, sex, urban/rural status, self-reported loneliness, and self-reported stress), with all significance levels well above 0.05. Results of the crosstab test of independence for RQ 2 are in Table 5.

Table 5

RQ 2 Crosstab

		Tests of Independence				
		Chi-Square	Adjusted F	df1	df2	Sig.
Computed body mass index categories * exercise in past 30 days	Pearson	1.385	.201	2.940	975.940	.893
	Likelihood ratio	1.380	.200	2.940	975.940	.893
Urban/rural status * exercise in past 30 days	Pearson	4.872	2.415	1	332	.121
	Likelihood ratio	4.937	2.447	1	332	.119
Sex of respondent * exercise in past 30 days	Pearson	.801	.354	1	332	.552
	Likelihood ratio	.800	.354	1	332	.552
How often have you felt this kind of stress * exercise in past 30 days	Pearson	3.782	.646	3.239	1075.510	.597
	Likelihood ratio	3.479	.594	3.239	1075.510	.632
How often do you feel lonely? * exercise in past 30 days	Pearson	2.121	.312	3.361	1115.850	.839
	Likelihood Ratio	2.087	.307	3.361	1115.850	.842

The adjusted F is a variant of the second-order Rao-Scott adjusted chi-square statistic. Significance is based on the adjusted F and its degrees of freedom.

Multivariate Analysis

The researcher then moved on to multivariate analysis to determine if a combination of factors may influence the obesity level and physical activity level in this subpopulation. She ran a complex sample logistic regression for RQ 1 [What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?], resulting in similar output as the bivariate results above.

The test of model effect significance for the independent variables' impact on obesity level was non-significant when testing living in urban vs rural counties, level of physical activity (exercise in the past 30 days), and sex, but was significant for self-reported levels of loneliness ($p = <0.001$) and self-reported levels of stress ($p = <0.001$). Results of the test of model effect significance for RQ 1 are in Table 6.

Table 6*RQ 1 Model Effects*

Source	Tests of Model Effects		Wald F	Sig.
	df1	df2		
(Corrected Model)	23.000	237.000	24.034	<.001
(Intercept)	3.000	257.000	45.476	<.001
@_Urbstat	3.000	257.000	.859	.463
Exerany2	3.000	257.000	1.091	.354
Sexvar	3.000	257.000	1.876	.134
Stress_R	10.000	250.000	3.505	<.001
Lonely_R	5.000	255.000	85.630	<.001

Dependent Variable: COMPUTED BODY MASS INDEX

CATEGORIES (reference category = Obese)

Model: (Intercept), @_URBSTAT, EXERANY2, SEXVAR,

Stress_R, Lonely_R

The test of model effect significance for RQ 2 [What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?] indicated that the independent variables' impact on physical activity level (exercise in the past 30 days) was non-significant. Living in urban vs rural counties, sex, self-reported stress, self-reported loneliness, and obesity level all had significance levels well above 0.005. Results of the test of model effect significance for RQ 2 are in Table 7.

Table 7*RQ2 Model Effects*

Source	Tests of Model Effects		Wald F	Sig.
	df1	df2		
(Corrected Model)	13.000	247.000	.645	.815
(Intercept)	1.000	259.000	4.217	.041
@_Urbstat	1.000	259.000	.838	.361
Sexvar	1.000	259.000	.357	.551
Stress_R	4.000	256.000	1.430	.224
Lonely_R	4.000	256.000	.191	.943
@_Bmi5cat	3.000	257.000	.351	.789

Dependent Variable: EXERCISE IN PAST 30 DAYS (reference category = No physical activity or exercise in last 30 days)

Model: (Intercept), @_URBSTAT, SEXVAR, Stress_R, Lonely_R, @_BMI5CAT

Results

A complex sample analysis was performed to explore whether residing in urban or rural counties in Alaska impacted physical activity levels or BMI levels, while controlling for sex, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

Model results indicated that rurality had no statistically significant impact when examining RQ 1: ‘What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?’. However, self-reported loneliness (Wald $F = 85.630$, $p = <0.001$) and self-reported stress (Wald $F = 3.505$, $p = <0.001$) were strongly associated and could be predictors of obesity levels for this subpopulation. Therefore, while the researcher was unable to reject the null hypothesis, she must conclude that the covariates of sex and physical activity level had

no impact on obesity level. She can, however, theorize that self-reported loneliness and stress may have an impact on obesity levels in this subpopulation.

Model results indicated that there were no statistically significant impacts on rurality for RQ 2: ‘What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?’. Therefore, the researcher was unable to reject the null hypothesis and must conclude that the covariates of sex, obesity level, self-reported loneliness, and self-reported stress had no impact on physical activity level.

Summary

In this quantitative study, the researcher sought to explore if rurality (living in urban vs rural counties) in Alaska had an impact on physical activity and/or obesity levels in Alaska Native Elders, aged 50 and over. She filtered the 2023 Behavior Risk Factor Surveillance System (BRFSS) data to examine responses from 360 Alaskans who were surveyed for that year of data collection and fit the scope of the study. She formulated two research questions and hypotheses to determine the impact of rurality on Alaska Native Elders’ physical activity level and obesity level, and covariates for each were (RQ1) sex, physical activity level, self-reported loneliness, and self-reported stress, and (RQ2) sex, obesity level, self-reported loneliness, and self-reported stress. A complex sample logistic regression analysis was performed to analyze the dataset and answer the two research questions below.

RQ 1: What is the association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

RQ 2: What is the association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older?

H_0 — There is no statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged 50 and older.

H_a — There is a statistically significant association between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress among Alaska Native adults aged

50 and older.

RQ1 failed to reject the null hypothesis. However, there was evidence that BMI was significantly impacted by the newly added Social Determinants of Health covariate responses of self-reported loneliness and self-reported stress. RQ2 failed to reject the null hypothesis, with no impact from the additional Social Determinants of Health covariate responses.

In Section 4, the researcher presented an interpretation of the findings, limitations of the study, recommendations for future research, and the public health practice and field-based products.

Section 4: Application to Professional Practice and Implications for Social Change

This quantitative cross-sectional study was conducted to determine if there was a statistically significant difference in obesity level and physical activity level based on rurality (living in urban vs rural counties) for Alaska Native Elders, aged 50 and over. This study was important because past studies have explored Alaska Native experiences across the lifespan or were focused on children/younger adults. There have been studies on aging; community design impact on physical activity, such as walkability via sidewalk and availability of health and wellness services; mental health and chronic disease impacts on obesity; and desire to age in place. Few studies were specifically focused on Alaska Native Elders, and the researcher could find no studies linking rurality (urban vs. rural counties) to levels of physical activity and levels of obesity. Understanding the impact that rurality (urban vs. rural counties) has on adults in this subpopulation could be extremely impactful, as this population is projected to continue to increase in the coming decades, and many may choose to age in place for as long as feasible (AARP, 2023; Rural Health Information Hub, 2024).

This study used 2023 BRFSS data and analyzed responses that fit in the scope of the study: living in Alaska, identified as Alaska Native, and aged 50 and over. A power analysis was run, resulting in a total minimum sample of 202 responses from Alaska. The dataset was analyzed using a complex sample analysis, and two independent research questions were explored. For RQ 1, the dependent variable was obesity level, while the independent variables were physical activity level, rurality (urban vs. rural counties), obesity level, physical activity level, self-reported loneliness, and self-reported stress. For

RQ 2, the dependent variable was physical activity level, while the independent variables were obesity level, rurality (urban vs. rural counties), obesity level, physical activity level, self-reported loneliness, and self-reported stress. While the study did not identify a linkage between rurality (urban vs rural counties) and obesity level or rurality (urban vs. rural counties) and physical activity level, it contributes to the literature regarding self-reported loneliness and self-reported stress and their direct impact on obesity level in Alaska Native Elders aged 50 and over.

Summary of Key Findings

The researcher conducted this complex sample analysis to determine if rurality (urban vs. rural counties) had an impact on levels of physical activity and levels of obesity in a specific population of Alaskans, Elders aged 50 and over. The study failed to reject the null hypothesis for both research questions. The analysis showed no statistical association between rurality (urban vs. rural counties) and obesity level when controlling for sex, physical activity level, self-reported loneliness, or between rurality (urban vs. rural counties) and physical activity level when controlling for sex, obesity level, self-reported loneliness, and self-reported stress, in this subpopulation, Alaska Native Elders aged 50 and over. However, RQ 1 did indicate a significant association between self-reported loneliness (Wald $F = 85.630$, $p = <0.001$) and self-reported stress (Wald $F = 3.505$, $p = < 0.001$), which could be predictors of higher obesity levels in this subpopulation. None of the covariates in RQ 2 was associated with rurality (urban vs. rural counties).

The failure to reject the null hypothesis does not mean that rurality (urban vs.

rural counties) was not associated with levels of obesity and physical activity; it may be likely that the number of cases included in this study was not enough statistical power to determine a true linkage. A power analysis with an anticipated medium effect size ($d = 0.3$), power level of 0.80, and alpha level of 0.05 was run, resulting in a total minimum sample of 202 responses for this study.

Responses to the 2023 BRFSS in this subset (living in Alaska, Alaska Native, and aged 50 and over) included only 360 total cases, which is above the minimum total sample required, but still a smaller pool of data to analyze, and could have impacted the study results. While the study's key findings indicate that rurality (urban vs. rural counties) did not directly impact obesity level or physical activity level for this priority population, a significant association was found when looking specifically at the impact of self-reported loneliness and self-reported stress on obesity levels. This new linkage could lead to tailoring of future program efforts, especially when outreaching to Alaska Native Elders wishing to age in place for as long as possible.

Interpretation of the Findings

This study was framed on the SEM, which was based on Bronfenbrenner's ecological systems theory (Meghani et al., 2023). The SEM hypothesized that an individual exists in the center of factors influencing the person, ranging from individual, interpersonal, organizational, community factors, and up to public policy (Bronfenbrenner, 1977). Individual-level examples could include age, health conditions, and level of physical mobility, as well as cultural food preferences and practices commonly found in this sub-population. Interpersonal-level examples could include

family support networks within communities, elder-to-younger mentorships, and traditional Village gatherings. Community-level examples could include Village pedestrian infrastructure, locations to be physically active, and access to various types of transportation. Organizational-level examples could include statewide Tribal Health Organization programs, statewide Community Health Aide Program presence, or regional Elder Care programs. Policy-level examples could include Tribal Corporations around Alaska, State of Alaska Health initiatives and programs, and Federal IHS programming. Though SEM has five levels, this study only examined two levels of the SEM, the individual level and community level (rurality), by analyzing responses from the BRFSS phone survey administered in Alaska. And though this study only analyzed two levels of SEM (individual and community factors), the findings could be applied at many other levels, with policy, system, and environmental changes recommended in the future.

Findings of this study indicated that rurality (urban vs. rural counties) had no impact on levels of obesity or levels of physical activity in this population. This was an interesting discovery, since the literature review indicated that individuals living in urban areas were more physically active, and/or those living in communities with greater walkability, or safer, more movable streetscapes were more likely to have higher levels of physical activity (Baobeid et al., 2021; Brüchert, 2021).

Findings of this study also indicated that self-reported loneliness and self-reported stress had an impact on levels of obesity in this population. The linkage found between levels of self-reported loneliness and self-reported stress impacting levels of obesity was not well documented in the literature search and may provide new avenues for future

study. This new linkage could inform future outreach programs specific to this population, emphasizing the linkage of obesity to self-reported loneliness and/or self-reported stress. The literature review did include some studies that found encouraging older adults to participate in group activities or mentorships to pass knowledge down to the younger generation, which may help them cope better with aging and continue to be healthier while staying in their home communities longer (Demientieff et al., 2023; Walch et al., 2021).

Limitations of the Study

The researcher encountered a few limitations while working with the 2023 BRFSS dataset for this analysis that could impact the study's generalizability, trustworthiness, validity, and reliability. The first limitation was the usage of secondary data. Using secondary data may have the potential to generate self-report bias, recall bias, and social desirability bias that could be unaccounted for in the final dataset. She accepted this limitation and presumed the data was collected to the best of the ability of the survey staff at the State of Alaska and shared with the CDC for analysis and publication on their public-facing website, but she had no way to verify the validity of the dataset.

The second limitation was the small size of the dataset used in this study. The researcher subset the total 2023 BRFSS data down to include only people in Alaska, those who identified as Alaska Native/American Indian, and those who indicated they were age 50 and above. This reduced the dataset from 433,000 to 360, which could have affected the findings related to rurality's (urban vs rural counties) impact on obesity level

and physical activity level.

The third limitation she encountered is the BRFSS sampling framework. While BRFSS is a random-digit-dialing on rotation process phone survey conducted multiple times per year and at different times during the day to ensure greater reach across the state, Alaska is vast and sparsely populated in many regions. This specific BRFSS cycle was also performed during 2022, when Alaska was still under the effects of COVID. Additionally, in the fall of 2022, Typhoon Merbok impacted Western Alaska, which resulted in at least 35 remote Alaska Native communities within the region being cut off from communication. Much of the state population included in this study relies on subsistence hunting/gathering practices, so some regional respondents might have been unintentionally excluded from the study. It should be noted that BRFSS ‘rakes’ or weights the dataset to counter this, and the researcher analyzed the sample with a CSA plan enabled, which further moderated that potential limitation.

A fourth limitation of utilizing the 2023 dataset was the newer Social Determinants of Health and Equity module that was just added to the survey in 2022. This module asks the questions “How often do you feel lonely?” and “Within the last 30 days, how often have you felt this kind of stress?” as Likert scale responses (CDC, 2024), which fed into the independent variables for self-reported loneliness and self-reported stress. Since these questions are newer, the validity and reliability of the responses may be in question, as they are deeply personal questions and may provoke self-report challenges such as recall bias or social desirability bias when asked by the interviewer.

A fifth limitation she identified was the phrasing of the physical activity question

in BRFSS, which had no prologue in the codebook and was simply, “During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?” (CDC, 2024). This question is very broad and could be rephrased to include a wider variety of activities that better pertain to rural living, such as fishing, hunting, berry picking, and other subsistence activities, include a prologue with additional context for older adults or those who speak English as a second language, or a qualifying question for more granular data collection.

Recommendations for Future Research

This research was aimed at identifying whether living in regions with varying rurality (urban vs rural counties) impacted the physical activity level or obesity level in an extremely narrow subpopulation of Alaskans: Alaska Native Elders aged 50 and over. In this study, the researcher studied one year of BRFSS, 2023, and controlled for sex, self-reported loneliness, and self-reported stress. The findings contrast with some of the literature she identified early on in this project, where urban living resulted in higher levels of physical activity and lower levels of obesity (Baobeid et al., 2021, Brüchert, 2021). However, two of the covariates, self-reported loneliness and self-reported stress, were aligned with prior studies, such as those by Brooks-Cleator (2020), which concluded that multi-generational activities and group events could help older adults counter loneliness and depression, and age in place as well as be a protective factor against lowering physical activity levels and rising obesity levels as the aging process continues.

The researcher would recommend that future studies be focused on multi-year pooling of BRFSS data once there are more years of self-reported loneliness and self-reported stress responses, as currently, there are only two years of data available. Future research could also explore the differences in the impact of rurality on other races living in Alaska, such as those identifying as white (64%), Hispanic or Latino (7.5%), or Asian (6.9%) (United States Census Bureau, n.d.-c). Future research could also explore the impact that education level and/or income level have on physical activity levels and obesity levels in these populations (Patel et al., 2022).

The researcher would also recommend that future studies attempt to separate the state into smaller regions, such as the seven public health regions that Alaska BRFSS uses for their callouts. The researcher communicated with the survey coordinator about using the regions for this study, and she recommended that the researcher use the national BRFSS dataset's urban vs rural counties variable, since the population is so small that many regions would need to be collapsed together for analysis (J. Barnett, personal communication, March 2025). Future researchers could pool BRFSS responses across years to try and attain the correct minimum sample size for that expanded study.

Integrating SEM into Research

The Social Ecological Model was based on Bronfenbrenner's ecological systems theory (Meghani et al., 2023), which posits that an individual may be influenced by many levels of factors such as individual, interpersonal, organizational, community factors, and up to public policy (Bronfenbrenner, 1977). Integrating the results of this research into the Social Ecological Model may happen on many levels, though this study was applied

only on two levels of the SEM, the individual level and the community level.

Intervention at the individual level may include recommendations that practitioners advise Alaska Native Elders on the advantages of higher levels of physical activity and the disadvantages of higher obesity as they age. These program efforts could also highlight the effect that loneliness and stress may have on obesity levels in this population. Intervention at the interpersonal/community level may include adding family activities or community activities to recommendations, such as listening circles or group walks in neighborhoods. This level of intervention may also impact the level of self-reported loneliness and self-reported stress in this population.

Intervention at the organizational level may include collaboration with CHAP, ANTHC, and SOA partners to create tailored outreach and programming in locations where Elders gather. This strategy of ‘meeting people where they are’ has been used in other public health strategies and was greatly effective during COVID (Otero, 2021). Interventions at the policy level may include built environment recommendations and/or upgrades to make getting physical activity easier and safer in locations where the recommended amount isn’t the easiest to attain. Using SEM to advocate for changes from the grassroots to the grass-top levels, Native Elders across Alaska may experience a better aging process in their home communities and Villages.

Implications for Positive Social Change

Implications for positive social change based on this study are far-reaching, especially considering the population of Alaska Native Elders (aged 50 and over) is projected to increase to reach 64,000 by 2050 (State of Alaska, 2024a) and that same

population has a disproportionate obesity rate when compared with the rest of the state population, 37.1% vs. 33.5%, respectively (CDC, 2023b). This population is scattered across Alaska, and many of these Elders intend to continue aging in place in their home Villages and/or communities.

Individual-level and community-level changes may have future positive social change effects, such as increasing the level of physical activity in the population, which could strengthen the community. Individual health improvements, i.e., greater levels of physical activity, may have a trickle-down effect and promote physical activity for middle-aged and younger generations as well. This type of effect has been successful in sharing knowledge down through generations for Traditional means of hunting, foraging, and other practices. This learning and growing could help younger adults create healthy habits and eventually successfully age in place themselves (Demientieff et al., 2023; Walch et al., 2021).

On a broader scope, organizational and policy-level changes may also have future positive social change effects; creating built environments suited for all ages and abilities is a core tenet of accessible design. Utilizing accessible design standards to create or redesign roads into healthy streets, separated multimodal paths, or better lighting could benefit the whole community or neighborhood. Ensuring that Alaska Native Elders can move freely and safely in their Village could also benefit those community members who are able-bodied and those who use mobility devices. Some of these changes may take time based on funding and prioritization of planned projects, but organizations and policymakers should keep the least mobile in mind when planning improvements

(Abraham & Pendergrast, 2023; U.S. Access Board, 2024).

Public Health Practice and Field-Based Products

The recommendation for public health practice based on the results of this study is that while living in regions with varying rurality (urban vs rural counties) seems not to have a measurable effect on the level of physical activity or obesity level, self-reported loneliness and self-reported stress directly impact the obesity level. This correlation may necessitate a greater level of focus on the Alaska Native Elder population's social determinants of health, especially those who intend to age in place (i.e., not move to a group facility).

The recommendation for positive social change would best fit the community level of SEM, in this case, clinic-based care in rural communities and Native hospitals in urban communities. Urging staff to focus on identifying Alaska Native Elder mental health and associated determinants in the short term and developing goals for future care programs could improve this population's longevity, regardless of where they choose to live out their golden years.

Additionally, using community-level health worker leadership to create a network of staff at facilities who are focused on Alaska Native Elder care may increase the impact of programming across the state. Creating a workgroup for identifying gaps in programming and collaborating to close them or building a train-the-trainer / ECHO (Extension for Community Healthcare Outcomes) model to share information across the state, might be a great inclusion for future program efforts.

Conclusion

The purpose of this study was to identify whether living in regions with varying rurality (urban vs rural counties) impacted levels of obesity and levels of physical activity in Alaska Native Elders aged 50 and over. The study was quantitative, used a single year of BRFSS data (2023), which was a secondary data set accessible through the CDC website. The data was collected by trained professionals at the State level, published by trained professionals at the Federal level, and included no personal health information. Due to the low sample size fitting the scope of the study, the researcher used the CDC urban vs rural variable, which merged low-population regions of Alaska into one dichotomous value and high-population regions of Alaska into another.

The study included covariates of physical activity, obesity, sex, self-reported loneliness, and self-reported stress. The researcher performed a complex analysis on 360 responses, and the results indicate there is no correlation between rurality and physical activity or rurality and obesity level in this population. There was no measurable impact of sex on either level of physical activity or level of obesity in this population. However, there was a linkage identified between higher levels of self-reported loneliness and higher obesity as well as higher levels of self-reported stress and higher levels of obesity.

The strength of this study lies in the applicability of the results to Alaska Native Elder populations in the near-term future. Results indicated that while rurality (urban vs rural living) has little to no effect on obesity levels and physical activity levels, self-reported loneliness and self-reported stress do adversely impact obesity levels in that same population. The results of this study could generate programming specifically

tailored to Alaska Native Elders and/or additional education for staff working with that population or in their communities. On a larger scale, a statewide collaborative network of partners could be formed to ensure that all Alaska Native Elders are receiving regular wellness checks and are able to participate in social activities.

The limitations of this study were the smaller study scope, including only Alaska Native Elders aged 50 and over; various biases such as survey bias, recall bias, and social desirability bias; sampling framework challenges based on secondary data usage, regional and seasonal challenges; and newer questions recently added to the survey in the 2022 cycle. These factors were mitigated by BRFSS staff as much as possible, and future studies pooling multiple years of data may help further lessen these factors.

Results of this study could be communicated to a broad range of stakeholders around the state, such as the statewide Older Persons Action Group or Alaska Commission on Aging (ACOA), and could impact their future programming and efforts to increase health in older Alaskans. The Alaska Commission on Aging works with the Department of Health in revising the State Plan for Senior Services, upholds their goals of keeping seniors strong and healthy, and could use results as a focal point in future efforts (State of Alaska, 2023b).

The existing programming across the state is a step in the right direction to give Alaska Native Elders support for their desire to age in place. For example, ANTHC runs regional Elder Care programming, CHAP staff located in communities around Alaska, and the statewide Fresh Start program (ANTHC, 2025; CHAP, 2025; SOA, 2024b). Increased local-level efforts to boost physical activity in this population as part of their

wellness checks in rural clinics or urban hospitals could be beneficial at the individual and community levels. However, a more unified Elder Care effort implemented in additional regions and/or communities across Alaska would be of greater impact to Alaska Native Elders intending to age in place. These program improvements could be presented directly to CHAP practitioners at a future Tribal Advisory Group meeting, during a future ANTHC ECHO, or during a future ACOA quarterly meeting. In the appendices, you will find a policy brief memo, a community health intervention plan, a visual representation of the intervention plan framework, and a fact sheet example.

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Appendix A: Policy Brief Memo

Strategies for Successful Aging in Place for Alaska Native Elders

Introduction: Physical activity level and obesity level directly affect how people will experience the aging process. Many older Alaska Native people wish to age in place as long as possible, be that in their home Village in remote/frontier Alaska, or in a more urban region like the Anchorage Municipality. Aging in place inherently expects self-sufficiency, and a higher level of physical activity is essential to living independently (Brooks-Cleater, 2020; Demientieff et al., 2023; Walch et al., 2021).

Scope of the problem: The population of Alaska Native Elders (aged 50 and over) is projected to increase to reach about 64,000 by 2050 (State of Alaska, 2024a) and that same population has a disproportionate obesity rate when compared with the rest of the state population, 37.1% vs. 33.5%, respectively (CDC, 2023b). Additionally, social determinants of health, such as self-reported loneliness and self-reported stress, have a direct impact on obesity levels and should be better monitored and managed in this subpopulation.

Current Approaches: A Native Tribal Health Consortium runs regional Elder Care programming, and CHAP staff provide wraparound healthcare at the community level, but some individuals and families live outside their catchment boundaries. The State of Alaska statewide program promotes greater levels of physical activity, though a specific Alaska Native Elder-focused campaign has not yet been implemented. (ANTHC, 2025; CHAP, 2025; SOA, 2024b).

Proposed Program or Policy: Individual level - Increased understanding of the negative impact lower physical activity and higher obesity can have on this population via an educational module for current CHAP staff and Elder Care program staff at the Native Health Consortium. Community level - incentivize educational modules with CEUs to attract more learners, and/or use the ECHO model to disperse information to a greater network of family and community members.

Major Constituencies: Individual level - staff and leadership, urban and rural Alaska Native Elders aged 50 and over; Community level - staff and leadership, their immediate families, and other community members.

Conclusions: Lower physical activity levels and higher obesity levels contribute to many chronic diseases and to many healthy years lost. Remaining independent is of great importance for Alaska Native Elders, which may make aging in place more possible and staying healthy for those years, both physically and mentally, is paramount (DiPietro, 2001; Gall et al., 2021).

Appendix B: Community Health Intervention Plan

Expanding Elder-care Programs in Alaska

Problem Definition:

Physical activity level and obesity level directly affect how people will experience the aging process. Many older Alaska Native people wish to age in place as long as possible, be that in their home Village in remote/frontier Alaska, or a more urban region like the Anchorage Municipality. Aging in place inherently expects self-sufficiency, and a higher level of physical activity is essential to living independently (Brooks-Cleater, 2020; Demientieff et al., 2023; Walch et al., 2021). The population of Alaska Native Elders (aged 50 and over) is projected to increase to reach about 64,000 by 2050 (State of Alaska, 2024a) and that same population has a disproportionate obesity rate when compared with the rest of the state population, 37.1% vs. 33.5%, respectively (CDC, 2023b). Additionally, social determinants of health, such as self-reported loneliness and self-reported stress, have a direct impact on obesity levels and should be better monitored and managed in this subpopulation.

Goal Setting:

Goal 1: Identify any Elder-focused efforts currently implemented in Alaska.

Goal 2: Identify contacts at the program level and build working relationships.

Goal 3: Review and evaluate the efficacy of current community-level Elder healthcare provided by entities in Alaska.

Goal 4: Identify gaps in individual healthcare (rurality [urban vs rural counties], funding streams, staffing shortages, education needs, etc.).

Goal 5: Work with community-level providers to close gaps in individual healthcare.

Target Population:

The short-term target population for this intervention is at the community level - healthcare providers around Alaska who work with Alaska Native Elders aged 50 and over, regardless of rurality (urban vs rural counties). Healthcare providers could include the Tribal Health Consortium staff and leadership, the CHAP staff and leadership, and the State of Alaska staff and leadership. The longer-term target population is at the individual level - urban and rural Alaska Native Elders aged 50 and over, their immediate families, and other community members.

Intervention Strategies:

Action 1: Search online for Elder-focused efforts in Alaska, consider outreaching to partner agencies known to provide elder care, such as the Tribal Health Consortium and CHAP, or have had Alaska Native outreach in the past, such as the State of Alaska. Document programs, location, catchment areas, contact info, etc. for follow-up.

Action 2: Build relationships with those programs and staff, and network to learn if there are other similar programs around Alaska yet to be identified. Document activities provided by programs, seasonal variations, unique or innovative activities, potential

replicable actions for other regions, etc.

Action 3: Review program activities Elder-focused healthcare programs are implementing, evaluate them for efficacy through staff discussion and/or survey, and if possible, reach out to provide listening circles or survey the Elders participating in programs and their families. Ensure there is documentation of all efforts and responses for any outreach.

Action 4: Through discussion, survey, listening circles, etc., with staff, program participants, and their families, identify and map out gaps in the system. Create a spreadsheet or other system to determine where gaps or duplication exist in programming and document as needed.

Action 5: Invite identified staff from each program to be part of a statewide network to improve coverage of care for Alaska Native Elders regardless of rurality. Consider meeting on a virtual platform so more program staff can participate in group work and track discussions with notes on strategies to improve care. Identify short, medium, and long-term goals for those strategies, and continue to meet and track actions contributing to progress on those goals.

Implementation Plan:

Timelines: Action 1: Fall 2025 – Spring 2026; Action 2: Fall 2025 – Summer 2026; Action 3: Winter 2025 – Summer 2026; Action 4: Spring 2026 – Winter 2026; Winter 2026 – ongoing.

Resources: Program staff from the Tribal Health Consortium and CHAP; meeting space if listening circles are implemented; SurveyMonkey or other; landline or cell phone for outreach; laptop or tablet for outreach, emails, documentation, etc.

Roles and Responsibilities: Community level – staff will be considered the subject matter experts and work as the core team to other entities around Alaska, as identified. They will be responsible for outreach, notes, surveys, meeting management, etc. Other entity staff will be considered partners for this project and will provide local information for their programs pertaining to Elder-focused healthcare, specifically obesity, physical activity, and self-reported loneliness and stress. Individual level - Elders and their families will be considered end users and will provide lived experience for the intervention plan. They will also have a seat at the table, helping draft goals and actions since it directly affects them, their families, and their communities.

Evaluation Plan:

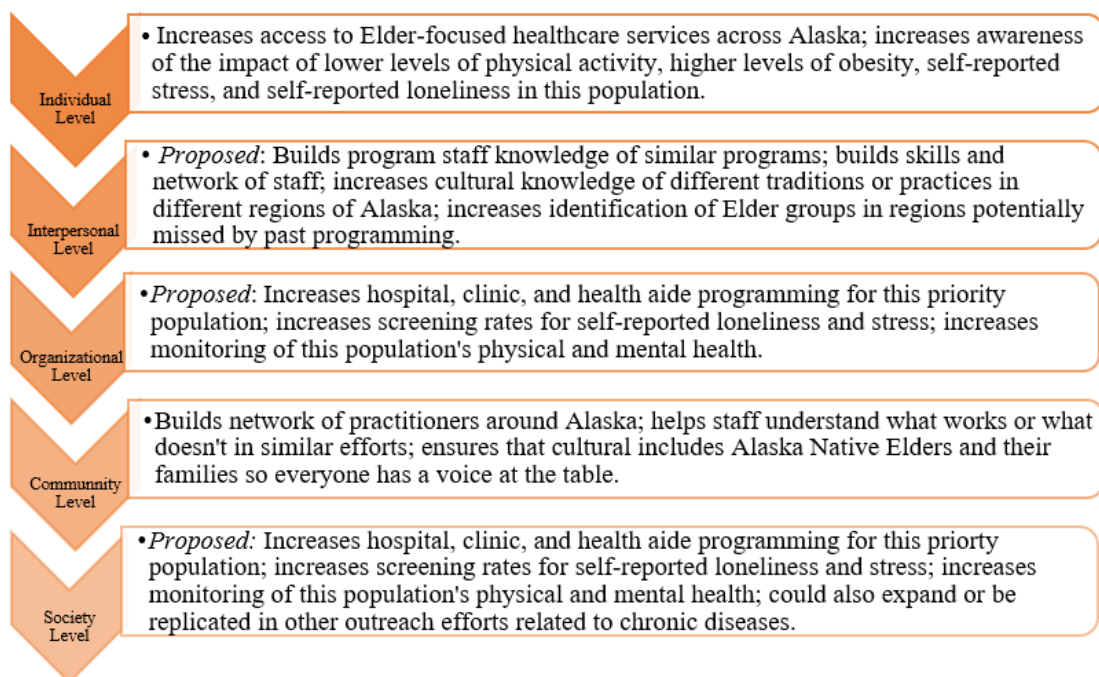
Evaluation for this intervention plan will include monthly check-ins with the core team to establish milestones that align with the timeline. Quarterly review of shared notes and supporting research documents will determine progress in the implementation plan goals and actions above; some of the actions are overlapping or ongoing and will have to be evaluated as such.

Appendix C: Visual Representation of Intervention Framework

Harmony and Balance in Life: Applying the Social-Ecological Model in AI/AN Communities



Note. This figure illustrates the concentric rings of societal impact on an individual as described by the Indian Health Service's Healthy Weight Model (IHS, n.d.).



Appendix D: Fact Sheet

*Alaska Native Elder Health Information:*

- About 39% experience obesity.
- About 32% had no physical activity in the last 30 days.
- About 29% said they were stressed in the last 30 days.
- About 33% said they were lonely in the last 30 days.

Knowledge Check:

- Did you know that the Alaskan Elder population is projected to grow to about 64,000 by 2050?
- Are you aware that there are few entities providing statewide Eldercare and assisting with health and fitness for older adults?

Planned Goals:

- Goal 1: Identify any Elder-focused efforts currently implemented in Alaska.
- Goal 2: Identify contacts at the program level and build working relationships.
- Goal 3: Review and evaluate the efficacy of current Elder-focused healthcare provided by entities in Alaska.
- Goal 4: Identify gaps in healthcare (rurality [urban vs rural counties], funding streams, staffing shortages, education needs, etc.).
- Goal 5: Work with Elder-focused healthcare providers to close gaps.

Link to SEM:

- Individual Level: Alaska Native Elders in both rural and urban communities
- Interpersonal Level: Family, preserving AN values, language, and culture
- Organizational Level: Tribal Health Consortium, CHAP, SOA, etc., collaboration
- Community Level: Built environment, local neighborhoods, and Villages
- Society Level: New policies may be beneficial for people of all ages and abilities

Get Active! At least 150 minutes of exercise per week, in as little as 5–10-minute increments, including strength and stretching.

Examples include:

- Walking or hiking
- Fishing or hunting
- Gardening or berry picking
- Housework or walking a pet