Facilitators and barriers to resident physical activity participation in rural long-term care: A facility perspective

by

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Abstract

Background – Physical activity (PA) within long-term care (LTC) environments is often low for a variety of reasons, but few studies have reviewed this through a rural geographic lens. This study aimed to understand the facilitators and barriers to resident PA participation in rural LTC from a facility perspective. A secondary aim was to understand strategies to promote resident PA within rural LTC. The administrative focus gives the opportunity to understand factors impacting PA from the facility level.

Methods – Using a mixed methods study design, both quantitative and qualitative data were collected in fall 2023 via surveys (n=31 facilities) and interviews (n=10 individuals) from individuals holding administrative positions (e.g., administrator, activities coordinator, director of nursing) in rural LTC settings across the state of Kansas. Survey items assessed facilitators on a 5-point Likert scale (1 = strongly disagree) to (5 = strongly agree). Respondents ranked barriers from (1 = not at all a barrier) to (4 = major barrier) and gave feedback on what would help promote PA participation from (1 = not at all helpful) to (5 = extremely helpful). Descriptive statistics were used to evaluate results from the survey. Thematic analysis was used to analyze interview findings, following an iterative process with two independent coders.

Results – Survey respondents agreed that provision of PA equipment (4.23±0.92/5), staff training (3.77+1.05/5), and dedicated staff and volunteers (3.68±1.22/5) were current facilitators of PA. Results showed that staffing shortages (2.35±0.84/4), insufficient funding (2.16±1.07/4), and absence of space (2.06±1.03/4) were minor barriers to resident PA participation. Data indicated that additional staffing (4.13±0.76/5), increased funding (3.94±1.21/5), greater family and resident involvement (3.94±1.03/5), as well as more outdoor opportunities for PA (3.90±1.08/5), enhanced PA programming (3.77±1.15/5), and dedicated space (3.58±1.15/5) would be helpful in improving resident PA participation in rural LTC. Interviews revealed four main themes: PA facilitators, PA barriers, facility approach to PA, and current PA levels. Interview findings supported what was found in the surveys and expanded upon initial findings. Notably, staffing, lack of resident motivation, and resident health status were frequently discussed barriers to PA. In addition to staff encouragement and collaboration, making PA enjoyable through gamification, outdoor activities, and the inclusion of music emerged as a potential facilitator of resident PA.

Conclusions –This study identified important facilitators and barriers that may help promote resident PA participation in rural LTC facilities. Findings can support intervention development to increase PA and improve the health of residents living in rural LTC.

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Chapter 1 - Introduction

Background and Significance

Globally, older adults (ages 60 years or older) are expected to account for 22% of the total population by 2050, making them one of the fastest-growing age groups (WHO, 2022). In the United States (U.S.), an older adult is someone 65 years or older (NCOA, 2022). There are currently 55.8 million older adults in the U.S., accounting for approximately 16.8% of the total population (AHR, 2021), and projections suggest this number will reach 88 million by 2050 (NIH, 2016). Aging is often associated with chronic health conditions. Indeed, nearly 95% of older adults have been diagnosed with at least one chronic health condition (e.g., hypertension, high cholesterol, arthritis), and 80% have two or more (NCOA, 2023). The U.S. is facing a growing aging population, which is accompanied by an increase in the prevalence of chronic health conditions. Thus, it is necessary to explore mechanisms promoting positive aging experiences for older adults' health, independence through maintenance of activities of daily living (ADLs), and enhanced quality of life. One such mechanism could be physical activity (PA).

Physical Activity and Aging

PA plays an important role in the aging process and has been shown to have many health benefits. Being physically active serves as a protective factor against chronic disease, aids in the maintenance of independence, and preserves functional mobility. Indeed, those who are physically active experience decreased risk for chronic disease, cognitive decline, and certain cancers, as well as a slower rate of aerobic and musculoskeletal decline (Chodzko-Zajko et al., 2009; Cunningham et al., 2020; Langhammer et al., 2018; Mechling & Netz, 2009; Milanović et al., 2013). Additionally, experts describe PA as “medicine” for older adults, as it provides both physical and

mental health benefits (Boolani et al., 2021; Soyuer & Şenol, 2011; Taylor, 2014) further demonstrating its importance in facilitating a healthy aging process.

Despite PA aiding in a healthier aging experience, PA participation decreases between 40-80% as one ages (Suryadinata et al., 2020). Indeed, on a global level, only 20-60% of older adults meet PA guidelines (Sun et al., 2013). In the U.S. few older adults meet the PA guidelines (Keadle et al., 2016). The U.S. Department of Health and Human Services recommends that older adults do at least 150 minutes of moderate activity or 75 minutes of vigorous activity and at least two days of strength training and balance exercises weekly (USDHHS, 2018). Though trends have shown increased PA participation in older adults (ages 65+) over the last two decades, recent estimates suggest that only 13.9% meet both the aerobic and muscle-strengthening components of the PA guidelines (Hyde et al., 2021). Improving PA among older adults is a public health challenge, particularly in rural regions. Individuals living in rural areas tend to experience varying levels of PA and face unique barriers to PA participation.

Rural Areas, Health Outcomes, and Physical Activity

Current estimates show that 10.6 million older adults live in rural areas in the U.S. (Smith & Trevelyan, 2020), which is expected to grow. Furthermore, there is a higher percentage of the aging population living in rural areas (17.5%) compared to urban areas (13.8%), demonstrating a need to focus on rural regions (Cohen & Greaney, 2023). Given the combination of having a large proportion of older adults and the increased risk for chronic disease and all-cause mortality in rural regions (Schiller et al., 2012; Singh & Siahpush, 2014; Warren et al., 2021), it is critical to understand PA levels and any potential influences on PA participation in rural areas.

Overall, there are mixed findings on rural activity levels. Some evidence suggests that older adults who live in rural areas are less likely to meet the PA guidelines than their urban counterparts

(Eberhardt & Pamuk, 2004; Omelan et al., 2017; Parks et al., 2003). Other evidence suggests that older adults living in rural areas are more active, have a higher reported quality of life, and have higher energy expenditures than those living in urban areas (Furtado et al., 2022; Kostka et al., 2017). There is little consensus on PA levels in rural areas, and the source for these discrepancies varies from differing PA measurement methodology to diverse barriers that influence PA opportunities (Arnadottir et al., 2009; Schmidt et al., 2021).

Rural areas have unique barriers that may make PA participation challenging, including inadequate infrastructure, access to resources, and limited transportation options (Gustat et al., 2020; Hansen et al., 2015; Kramer-Kostecka et al., 2022; McWhinney et al., 2011). In rural areas, differences in cultural norms and challenges related to policy and funding have also been notable barriers to PA participation (Barnidge et al., 2013; Lo et al., 2017). While rurality is important to consider when discussing aging environments, it is also beneficial to understand an individual's physical living environment's impact on PA participation, particularly that of living in long-term care (LTC). Among older adults in the U.S., just over 2.1 million live in LTC facilities (e.g., nursing facilities and assisted living) (CDC, 2022), and this number has been projected to triple by 2050 (PAHO, 2019). As this number continues to grow, understanding the relationship between LTC and PA will aid in ensuring these environments facilitate healthy aging through PA.

Long-term Care and Physical Activity

LTC is nuanced and exists on many different levels. There is a range of living options that older adults can choose from depending on the level of care that is needed. Figure 1.1 outlines the living choices available for older adults and demonstrates an increasing level of care provided. The red boxes indicate which facilities the current study focused on. Living in LTC has been associated with a decreased quality of life (Scocco et al., 2006), which was exacerbated by the effects of the

Figure 1.1 Spectrum of Senior Living Options

pandemic (Cruise et al., 2023). LTC residents are often diagnosed with chronic health conditions. One report revealed that over three-fourths of residential care residents have two or more conditions (Caffrey & Rosenoff, 2012). Despite high rates of chronic health conditions and low rates of PA, no formal PA guidelines exist for LTC facilities (McArthur, 2019). However, a task force organized by The International Association of Gerontology and Geriatrics Global Aging Research Network published a report recommending 35-45 minutes of aerobic and strength training PA sessions twice weekly for older adults in LTC (De Souto Barreto et al., 2016). Despite these recommendations, LTC residents tend to have lower PA levels and participation than their community-dwelling counterparts (Akosile et al., 2021; Kalinowski et al., 2012; Weeks et al., 2008). LTC residents also spend large amounts of time being sedentary (Resnick et al., 2018; Ikezoe et al., 2013), which has been linked to poor health outcomes (de Rezende et al., 2014; Park et al., 2020). There is a clear need to address PA within LTC settings. One place to start is to understand what facilitators and barriers play a role in PA in LTC facilities.

Facilitators and Barriers to Physical Activity in Long-term Care

There are numerous facilitators and barriers to PA participation and promotion within LTC facilities that can be categorized across levels of the social ecological model. Ecological models were first introduced by Bronfenbrenner in the 1970s (Bronfenbrenner, 1979), and they have since expanded to help understand health behaviors and health promotion. In particular, McLeroy et al. (1988) outlined the benefits of understanding health promotion through a socio-ecological perspective. This model is useful in helping one understand the facilitators and barriers to PA within LTC settings. First, there are individual-level barriers to resident PA participation, namely health status and physical limitations (Bender et al., 2021; Benjamin et al., 2014; Chen, 2010; Guerin et al., 2008). Additional individual barriers include a lack of interest or motivation and a lack of knowledge regarding PA (Arıkan Dönmez & Aslan, 2023; Chen, 2010; Resnick et al., 2008; Webster et al., 2023). At the interpersonal level, the quality of social support can impact residents' desire to be physically active (Holmes et al., 2017). Multiple barriers arise when examining the organizational, policy, and environmental levels. Among the notable organizational and policy barriers are staffing limitations, inflexible organizational routines, lack of time, and inadequate communication between staff (Baert et al., 2015; Benjamin et al., 2014; Galik et al., 2009; Mahrs Träff et al., 2019). On the environmental level, lack of space is a common barrier to PA participation (Baert et al., 2016; Benjamin et al., 2014). Indeed, several studies suggested that LTC facilities are not typically designed with PA in mind, leading to restrictive PA environments (Chen, 2010; Mahrs Träff et al., 2020; Uemura et al., 2018). As evidenced by the literature presented, comprehensive strategies must be designed to thoroughly address the barriers at multiple levels.

PA promotion strategies within LTC settings include involving residents in the decision-making process and programming (Hawkins et al., 2018), integrating PA into ADLs, and incorporating group activities (Benjamin et al., 2014; De Souto Barreto et al., 2016; McArthur, 2019; Phillips & Flesner, 2013). Additionally, supportive leadership, teamwork, encouraging residents to be active, frequent staff communication, and understanding residents' needs have also been found to be facilitators for participation in PA and restorative programs (Galik et al., 2009; Guerin et al., 2008; Resnick et al., 2006; Resnick et al., 2008; McArthur et al., 2021). On the environmental level, designing the environments to support PA, mainly walking (Benjamin et al., 2011; Lu, 2010) and providing outdoor PA opportunities (Joseph et al., 2006) have been linked to increased PA. The evidence presented above provides strategies that have been employed to address PA and similar programs within LTC. However, only four of the studies mentioned above (Joseph et al., 2006; Lu, 2010; McArthur et al., 2021; Phillips & Flesner, 2013) included aspects of rurality in their study, meaning there is a need to explore rural LTC in greater depth.

Statement of the Problem

Several gaps in the research currently exist. Most research on PA in LTC facilities is dated, outside of the U.S., and from urban rather than rural settings. To the extent of my knowledge, no studies have explored PA in rural LTC facilities from an administrative perspective. Literature suggests that the majority of the factors impacting PA participation occur at the facility level, which is why this study aims to address this level. Therefore, further exploration of facilitators and barriers to resident PA participation and examination of tangible PA strategies in LTC facilities is needed, particularly from an administrative perspective in rural areas.

Purpose of the Current Study

The purpose of this study is to examine the facilitators and barriers to resident PA participation in rural LTC facilities from a facility administrative perspective. Additionally, this study seeks to gain insight regarding potential strategies to increase PA participation in rural LTC settings. The knowledge gained from this study may benefit LTC facilities in rural areas by providing a comprehensive understanding of facility-level facilitators and barriers to PA participation for residents. A better understanding of what supports and inhibits PA in these settings may reveal potential areas for future PA interventions in rural LTC and highlight potential gaps in resources. Specifically, this study aimed to answer the following research questions:

- What are the facilitators and barriers to resident physical activity participation in rural long-term care facilities from a facility perspective?
- What are the strategies on how to improve resident PA participation in rural long-term care from a facility perspective?

Chapter 2 - Literature Review

Physical Activity and Active Aging

Continuous participation in PA has been known to have many health benefits, especially as one ages. An umbrella review of systematic reviews and meta-analyses by Cunningham et al. (2020) highlighted the positive and negative consequences of not being physically active in older adulthood. This study analyzed 24 reviews and found that older individuals who engaged in higher levels of physical activity experienced numerous advantages. Benefits included decreased cognitive decline, enhanced physical function, improved ability to perform ADLs, reduced risk for all-cause mortality, various cancers, falls, depression, and cognitive disorders like Alzheimer's. Also, results showed a positive relationship between PA and healthy aging (ES = 1.14, 95% CI: 1.07 to 1.22, $P < .001$), further demonstrating how PA can lead to a healthier aging experience (Cunningham et al., 2020). McPhee et al. (2016) also found a positive link between PA and health outcomes, maintenance of physical function, and ADL performance. A study conducted by Boolani et al. (2021) pointed out the mental health benefits of PA. In this pilot study, older adults (n=11) living in New York experienced a reduction in mood disturbance ($P = .001$), less fatigue ($P = .005$), decreased confusion ($P < .001$), and increased energy levels ($P = .027$) after completing a six-minute walk. Similarly, a study by Soyuer and Şenol, (2011) examined the link between older adult PA levels and fatigue. In this cross-sectional analysis surveying Turkish older adults (n=124), it was found that those with greater levels of PA participation were less likely to experience symptoms of fatigue (Soyuer & Şenol, 2011), which further demonstrates the connection between PA and affective health outcomes. PA has also been found to be an effective form of fall prevention. Expanding upon a 2019 Cochrane review, Sherrington et al. (2020) evaluated 44 studies, adding 9 new studies to the existing 108. It was found that exercise, in general, can reduce

risk of falls up to 23%, and more specifically, programming targeting balance and physical function with a dose of three or more hours per week was shown to reduce risk of falls up to 42% (Sherrington et al., 2020). These findings display how PA can be utilized to help older adults maintain physical function and independence. Despite the many benefits of being physically active as one ages, recent estimates by Hyde et al. (2021) suggest that older adults are insufficiently active. Although it was found that the percentage of older adults (ages 65+) meeting both the aerobic and muscle strengthening portions of the PA guidelines has increased from 8.6% in 1998 to 18.6% in 2018 (Hyde et al., 2021), 4 out of 5 older adults are still not meeting guidelines. There is a substantial public health need to find beneficial and feasible ways to increase PA participation in this population.

Rural Physical Activity

Research has told a complex story in terms of PA levels in rural geographic areas. Historically, evidence has suggested that PA levels are lower in rural regions. Indeed, Parks et al. (2003) conducted a cross-sectional study of U.S. adults (n=1,818), determining that those living in rural regions were least likely to meet PA guidelines. Similarly, Martin et al. (2005) conducted a study examining variations in PA participation in adults across regions in the U.S. Results revealed that physical inactivity prevalence was highest (33.1%) in rural areas. Further, they found that the prevalence of meeting PA guidelines was lowest in rural areas, with a notable association between degree of urbanization, physical inactivity, and PA in the South (Martin et al., 2005). More recently, studies have displayed a similar trend. Notably, a recent report by Whitfield et al. (2019) highlighted how, although prevalence of those meeting PA guidelines in rural US regions has increased from 13.3% to 19.6%, the total number meeting guidelines remains quite low. More simply, only one in every five US adults living within a rural region meet PA guidelines (Whitfield

et al., 2019). In terms of rural older adults, Trivedi et al. (2015) found that older adults living in rural areas were more likely to have no leisure-time PA (38.8%) and were less likely to meet PA guidelines (41.5%). On an international scale, Omelan et al. (2017) surveyed Polish seniors (n=274) using an interview questionnaire that examined leisure-time activities and PA habits. Results revealed that PA participation was significantly lower in rural areas compared to urban areas (Omelan et al., 2017). Conversely, a cross-sectional study by Furtado et al. (2022) examined the activity levels, physical function, and health-related quality of life of Portuguese older adults (n=259) living in urban (n=139) and rural areas (n=120). Not only were older adults in rural areas shown to have higher ratings of health-related quality of life, but higher physical function. Interestingly, PA levels did not differ between urban and rural living environments (Furtado et al., 2022). Arnadottir et al. (2009) had similar findings. Their cross-sectional study examining the PA of Icelandic older adults (n=186) in rural and urban communities found that there was no difference in PA levels between the two. Additionally, Kostka et al. (2017) conducted a study of older Polish adults (n=2079) from 2006-2013 living in three environments (rural, urban, and nursing homes). Findings demonstrated that older adults living in rural regions had the highest PA-energy expenditure among the three groups, and those in nursing homes had the lowest, which indicates the physical setting (e.g., LTC) may be more important to PA, than the actual region (Kostka et al., 2017). Additional reasons for variance in PA levels may be the result of unique barriers that arise in rural environments.

Barriers to Rural Physical Activity Participation

In general, there are various barriers that might impact PA participation in rural areas. A review by Hansen et al. (2015) reveals that rural communities face several barriers as a result of their lower population density including absence of public transportation options, deficient

walkable environments and road infrastructure, and physical distance to destinations. Additional barriers include limited presence of and access to recreational resources, poor pedestrian safety, and weather (Hansen et al., 2015). Furthermore, rural infrastructure is oftentimes not conducive to PA participation. Indeed, Gustat et al. (2020) used data from the Bogalusa Heart Study to examine the relationship between the built environment and PA participation of 1,245 U.S. adults. Their environmental audits found that street segments in rural areas had little to no supportive features for PA, and street characteristics were lacking in pedestrian safety features, aesthetics, and walkable destinations (Gustat et al., 2020). A study conducted by Pelletier et al. (2022) demonstrates the connection between social support and PA levels in rural regions, noting that lack of social support was reported more in rural regions and was significantly associated with being less likely to meet PA guidelines. This suggests a level of social isolation in rural areas that is not present in urban areas, which may impact PA participation. Notably, barriers are also found at the policy level. Barnidge et al. (2013) interviewed key informants (e.g., policy makers, public health practitioners) (n=13) to better understand the barriers towards PA change in U.S. rural areas. Their analysis noted insufficient funding, lack of influence at the state level, inadequate human capital, cultural attitudes, and difficulties getting leadership on board as barriers to implementing changes that would promote PA (Barnidge et al., 2013). Similarly, Lo et al. (2017) highlighted how, in addition to poor walkability and lack of access to facilities, lack of funding, political willingness, and city planning were ranked among barriers from key informants and residents (n=118) in rural Montana. In all, it is important to note that barriers to PA span multiple levels in rural regions.

Differences in Access and Care Outcomes in Rural Long-term Care

There are many obstacles to providing LTC in rural regions, and there are often disparities in health outcomes of residents. Rahman et al. (2022) noted that rural LTC residents had a higher

prevalence of unmet needs (i.e., inability to access quality care when needed) compared to those living in urban areas, which indicates a difference in access, availability, and affordability of resources. A study by Zhang et al. (2020) found similar findings in terms of LTC needs in rural areas. Their study analyzed responses from older adults (n=6,909) living in rural and urban areas in China. It was found that the need for LTC services was much higher for rural older adults, and that older adults were more likely to need community resources. Despite the increased need in rural areas, the LTC resources were not widely available (Zhang et al., 2020). In their literature review (n=10) Quigley et al. (2021) examined differences in care in relation to location in the U.S., suggesting that the more rural the nursing home, the lower quality of care received by residents. Further, compared to their urban counterparts, rural locations were found to have poor access to hospice care service providers (9.60 vs. 0.55 providers) (Temkin-Greener et al., 2012) and patients in these locations were more likely to experience hospitalization (OR = 1.50, 95% CI = 1.16–1.94) and increased pain (OR = 1.68, 95% CI = 1.35–2.09) (Kang et al., 2011). Bowblis et al. (2013) analyzed 152,356 surveys from 17,953 nursing homes in the U.S. using data from the Online Survey Certification and Reporting (OSCAR) System. Study findings revealed that rural nursing homes had higher contracture rates (i.e., instances of muscle and joint issues causing immobility), and that discrepancies can possibly be attributed to differences in organizational structure, funding sources, case-mix, and staffing. There are clear rural geographic disparities that exist in terms of quality of care in LTC settings, but in terms of PA, it is important to account for how LTC settings can influence resident PA levels.

Physical Activity in Long-term Care

PA within LTC environments is low for a variety of reasons, ranging from the individual to the LTC facility's environment. Oftentimes, community-dwelling older adults have higher levels

of PA participation. Using a qualitative study design, Weeks et al. (2008) evaluated activity levels in community-dwelling and nursing home residents in Canada. It was found that community-dwelling older adults participated in a mean of four days per week of vigorous activity, while those in nursing homes reported none. Additionally, nursing home residents logged more days of sedentary activity (Weeks et al., 2008). Similarly, a cross-sectional study by Akosile et al. (2021) examined the responses of older adults (n=114) in Nigeria to determine the difference in PA, quality of life, and fear of falling between those living in assisted living facilities and the community. Results revealed that those living in assisted living facilities have lower levels of PA *(F=5.06–103.34; p<.050)*, reduced fall efficacy *(F=159.17; p<.001)*, and decreased quality of life scores *(F=11.12–118.05; p<.050)* compared to their community-dwelling counterparts. Not only do LTC residents tend to have lower levels of PA, but they also have been found to have lower self-efficacy for exercise (M=29.96±19.48) than older adults living in the community (M=52.74±18.71) (Byrne & Horgan, 2018). Sedentary activity is a common occurrence within LTC settings. Resnick et al. (2018) monitored the PA levels of residents (n=242) living in 26 different assisted living facilities across Massachusetts, Maryland, and Pennsylvania, using objective MotionWatch 8 technology. Results revealed large amounts of time in daily sedentary activity (1,236 minutes) and little PA participation (42 minutes of moderate, 6.9 minutes of vigorous). Notably, they found that 47% of residents performed no vigorous activity at all (Resnick et al., 2018). A study by Ikezoe et al. (2013) supported these findings in that those living in nursing homes spend over 50% of daylight hours performing sedentary activities, while De Souto Barreto et al. (2015) pointed out that 64.6% of residents did not participate in the exercise classes provided, further demonstrating the inactivity challenge faced by LTC facilities. Given that inactivity is

prevalent throughout LTC, it is valuable to understand the facilitators and barriers to PA that arise in LTC.

Facilitators and Barriers to Physical Activity in Long-term Care

There are many facilitators and barriers to PA participation in LTC facilities, and it is important to note that they span multiple levels. Webster et al. (2023) evaluated resident perspectives on PA of older adults (n=20) living in assisted living facilities. Residents indicated low motivation, physical health limitations, safety concerns, dissatisfaction with programming, and lack of PA knowledge as main barriers to PA participation, which were supported by findings in similar studies conducted across the globe (Arıkan Dönmez & Aslan, 2023; Chen, 2010; Guerin et al., 2008; Phillips & Flesner 2013). PA is often accompanied by a social aspect, which is helpful in encouraging PA participation in LTC environments. Indeed, Holmes et al. (2017) utilized data (n=171) from an existing randomized controlled trial in Northeast U.S. and found notable predictors for PA participation were social support and satisfaction with activities. Both Webster et al. (2023) and Bender et al., (2021) conducted their studies within the U.S. and had similar findings in that residents preferred group activities and opportunities for social engagement, which highlights how the social environment can be a facilitator for PA.

PA programmatic efforts can also influence residents' PA levels. Notably, in their cross-sectional study of German older adults (n=217) living in nursing homes (Kalinowski et al., 2012), residents stated a lack of say in PA programming, one-size fits all style group sessions, absence of PA education and promotion, and lack of quality instructors were considered barriers towards PA participation. An ethnographic study by Mahrs Träff et al. (2019) highlights similar findings in Swedish assisted living facilities, noting that availability of exercise sessions, lack of appropriate and interesting programming, resident interest, and exclusion of residents from programming

decisions were some frequently mentioned barriers. Bender et al. (2021) explored barriers to PA participation in African American older adults (n=25) living in assisted living facilities in urban Atlanta. Location of exercise classes, the physical space design, and quality of programming were listed as barriers (Bender et al., 2021). This indicates greater resident involvement and fostering of autonomy for programming could potentially serve as facilitators to PA. Expanding beyond the individual level, organizational culture and conducive physical LTC environments may also be facilitators for PA.

Many studies discovered barriers and facilitators at the organizational and environmental level. Benjamin et al. (2011) conducted focus groups with residents (n=42), staff (n=62), and significant others (n=46) in LTC facilities in Ottawa, Canada to determine factors that influenced PA participation in LTC. Upon analysis, it was revealed that inadequate organizational support for PA (e.g., staffing, lack of funding, programming challenges), stringent institutional routines (e.g., adhering to schedule, heavy workloads) and environmental limitations (e.g., lack of space, poor facility design, equipment) were barriers to PA participation (Benjamin et al., 2011), which supports previous findings in a similar study in 2009, which targeted administrators' perspectives (Benjamin et al., 2009). Benjamin et al. (2009) qualitatively explored factors influencing resident PA in LTC facilities by interviewing facility administrators (n=9) and found that funding, the built environment, and staffing were frequent barriers to PA. Notably, Benjamin and colleagues conducted a review that further bolstered these findings of organizational and environmental barriers to PA (Benjamin et al., 2014). Similarly, Baert et al. (2016) discovered multilevel barriers and facilitators. They examined motivators and barriers for PA in LTC facilities located in Flanders, Belgium. This was a multimethod study that started with 24 qualitative interviews with facility administrators, whose responses then informed the quantitative survey sent to facilities across the

region. Survey responses (n= 127) indicated a total of 42 motivators and 56 barriers across the individual, interpersonal, and community levels varying in degree of importance. Top motivators were maintaining resident well-being/health, social and family support, facility resources and adequate financial funding, while barriers included other care priorities, absence of space, and not wanting to force the residents to be active (Baert et al., 2016). These findings helped to confirm a previous study conducted by Baert and colleagues conducted in 2015 from a physiotherapist perspective (Baert et al., 2015). Resnick et al. (2008) conducted focus groups with nursing assistants (n=93) in a qualitative study aiming to examine barriers to restorative care in nursing homes within the U.S. Similar barriers arose, but findings revealed useful potential facilitators, including staff encouragement, establishing trust, offering choices, integrating activities into daily routines, administrative support, and making activities enjoyable. These findings supported results identified in a similar study conducted by this research group (Resnick et al., 2006). Though not specifically focused on PA, these studies provide helpful insight as to what potential facilitators and barriers to PA might look like in similar settings. Mahrs Träff et al. (2020) completed an ethnographic study to evaluate how the environment influences PA behaviors in four Swedish assisted living facilities. Environmental aspects that promoted PA were the presence of fitness rooms and multipurpose rooms. Factors that were considered barriers were limited apartment size and locked doors. Interestingly, long corridors and outdoor environments were designated as both a facilitator and a barrier depending on whether they were adapted to residents' needs and maintained accordingly (Mahrs Träff et al., 2020). Similarly, in their review of studies (n=12) Douma et al. (2017) looked at environmental factors that contributed to physical inactivity in residential care settings. They found that larger buildings, accessibility in terms of building design, availability of resources, appropriate building security, and number outdoor features were linked

to lower levels of inactivity. In all, barriers and facilitators to PA in LTC exist across multiple levels, which indicates a need to provide comprehensive strategies to increase resident PA participation in LTC settings.

Rural Long-term Care and Physical Activity and the Existing Gaps

Physical activity within rural LTC is not widely studied. Indeed, in the PA and LTC literature presented, very few had any element of rurality. In his review of LTC walking environments Lu (2010) only four of the 26 facilities evaluated were in a rural region. When rurality was mentioned in a study, it was not a major focus of the study or was vaguely addressed in their methodology (Joseph et al., 2006; Kalinowski et al., 2012; Mahrs Träff et al., 2017). Indeed, McArthur et al. (2021) pointed out how factors like rurality were not often provided or described in LTC studies. Hall and McAuley (2011) noted most were rural facilities in their study about PA and physical function in LTC residents. However, facilitators and barriers to PA were not the focus, nor was it from an administrative perspective. Similarly, Phillips and Flesner, (2013) evaluated PA in rural assisted living facilities, but it was from the residents' perspective, thus, leaving room for further exploration.

Purpose of the Current Study

The literature has highlighted several facilitators and barriers to PA that exist in LTC. However, many of these studies fail to address the aspect of rurality. While similarities across regions likely exist, we cannot say for certain that rural LTC facilities' facilitators and barriers for PA are the same as their urban and suburban counterparts. As indicated by rural literature presented, it is likely there are unique facilitators and barriers to PA in rural LTC facilities. In addition to the lack of rural representation in the PA and LTC literature, many of the studies examined the facilitators and barriers to PA through a therapeutic lens (e.g., physiotherapy,

restorative care) rather than a daily living behavior. Additionally, past studies typically sought the perspective of residents and staff members rather than from those holding administrative positions who might be able to better address increasing resident PA and establish long-term change. Reviewing facilitators and barriers to resident PA at an administrative level may prove to be beneficial, as starting at the top can often lead to positive long-term change. Lastly, the literature regarding facilitators and barriers to resident PA is relatively dated. Thus, this study strives to combine the above factors and explore the facilitators and barriers to resident PA in rural LTC from an administrative perspective.

Chapter 3 - Methods

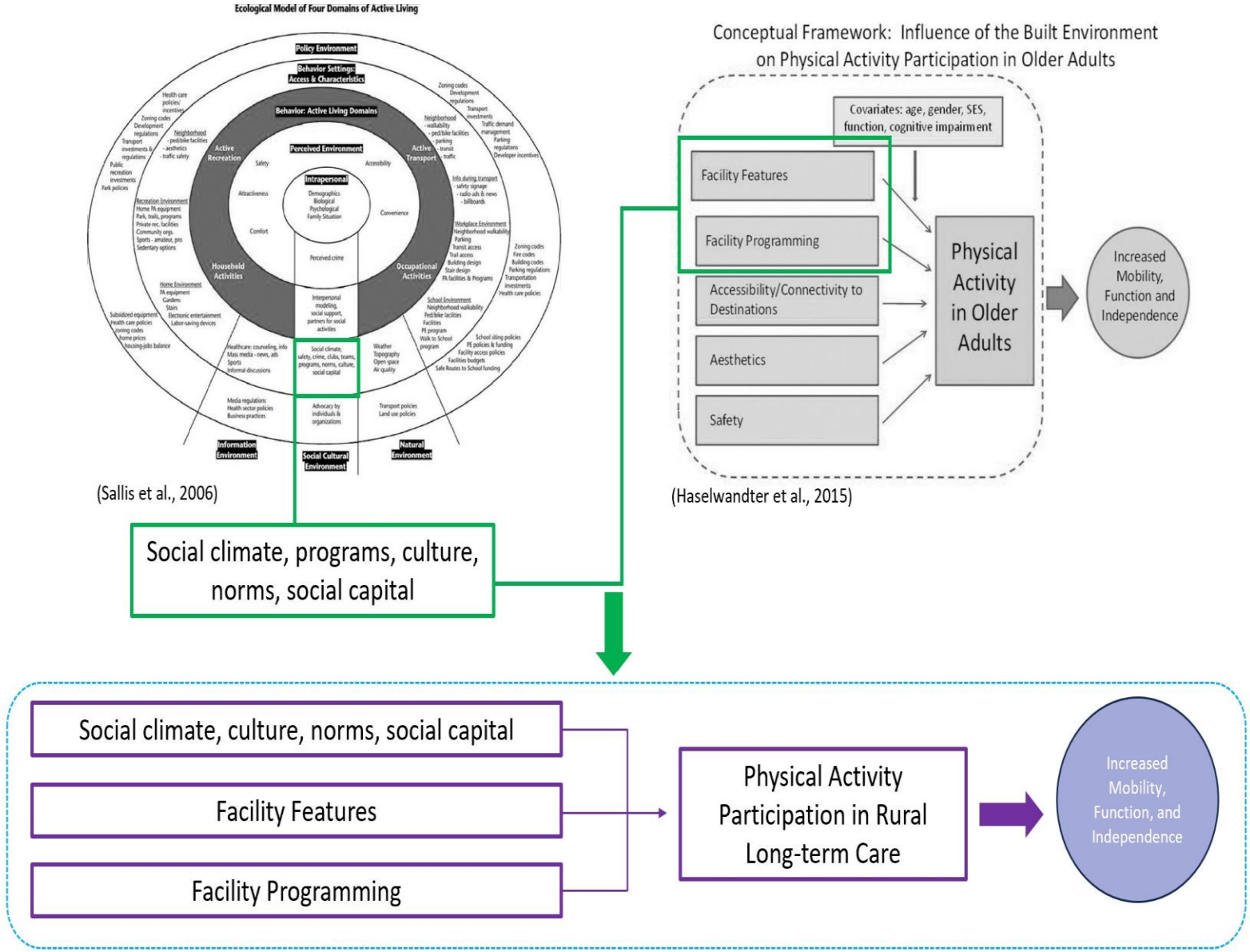
Study Design and Setting

To address the research questions, this study followed a cross-sectional mixed methods approach, collecting both survey and interview data. A single group of individuals holding administrative positions in rural LTC were recruited across the state of Kansas. Kansas was selected due to proximity and because 66 of 105 counties (approx. 63%) are considered rural, which helps address the rural component of the current study.

Conceptual Framework

This study employed a blended framework of the socio-ecological model for active living (Sallis et al., 2006), and a built environment framework proposed by Haselwandter et al. (2015). Specifically, the combined framework outlines the influences of environmental characteristics on PA participation in older adults in LTC facilities as identified in the literature reviewed above. (Figure 2.1). The current study was particularly interested in the social environment level in terms of organizational culture, value and promotion of PA, and how that influences PA behaviors in older adults in rural LTC. This is why this study targeted the intersection of the intrapersonal level and social cultural environment (e.g., social climate, programs, norms, cultural, and social capital) outlined by Sallis et al. (2006). The framework by Haselwandter et al. (2015) provides the LTC context needed for this study by addressing both built environment and programmatic elements that are relevant to LTC settings and the study population of older adults. The combination of these two models provided a purposeful foundation for this study and helped to pinpoint an area of focus, which guided the creation of the survey and interview questions.

Figure 2.1 - Conceptual Framework



Participants and Recruitment

This study targeted individuals holding administrative positions within rural long-term care facilities in Kansas. Potential facilities were identified through the publicly available Kansas Department of Aging and Disability Services (KDADS) facility directory (KDADS, n.d.), and rurality was determined using the 2013 USDA Rural-Urban Continuum Codes (RUCC) (USDA, 2024). The RUCC has nine code values ranging from one (metro - counties in metro areas of 1 million population or more) to nine (nonmetro - completely rural or less than 2,500 urban population, not adjacent to a metro area). To ensure an adequate sample size, this study defined rurality by utilizing RUCC values six through nine (See Appendix A) as initial guidance before setting the county population limit of <10,500 individuals. The final list was created by combining the RUCC values and the facilities that fell within the set population range. Facilities had to be designated by KDADS as either an assisted living facility, nursing facility, or both to be considered eligible for the final list. Further study participants were screened using the following inclusion and exclusion criteria. Inclusion criteria included: 1) participants have worked full-time at the facility for at least four months, 2) participant holds an administrative position (e.g., facility administrator/coordinator, wellness coordinator, activities director, director of nursing, etc.), 3) facilities are located within a rural region in the state of Kansas (i.e., population of <10,500), and 4) facility is an assisted living facility AND/OR a skilled nursing facility only as designated by KDADS. Exclusion criteria included 1) administrators without access to an electronic device that connects to the internet.

Facilities were contacted over the phone using the combined KDADS and RUCC alphabetical list to acquire a valid email address. A standardized script was utilized to ensure consistency for the initial phone call (See Appendix A). The survey portion of this study consisted

of three waves of recruitment: initial contact, first follow-up, and final follow-up (See Appendix A). If the facility did not answer or the potential party was not available during the initial contact, they were recontacted a week after the first phone call was made. If, after the second attempt of contact, the facility still did not respond or the researcher left a voicemail, they were contacted for a third and final time a week after the second phone call. If the facility was not reached after the third attempt at contact, they were considered not interested in participating in the study and recruitment efforts ceased. Once an email was successfully acquired, an email with a link to the survey was sent. Ten days after sending the initial email, the research team sent a reminder email to non-respondents. Three additional email reminders were sent to non-respondents after the first reminder to increase participation. For the interview portion, respondents were asked to sign up at the end of the survey by entering their email address. Due to low initial interest, the researcher utilized a list of survey completers provided by Qualtrics to follow up by phone and gauge potential interest in scheduling an individual interview. It is important to note the list furnished by Qualtrics only listed survey completion status, not actual data responses to the survey; thus, data confidentiality was preserved. Individuals were called in the order they appeared on the list until sufficient recruitment numbers were met.

Monetary incentives were offered to participants in the form of gift cards. Upon the survey's completion, participants were entered into a drawing for a chance to win a $50.00 gift card, with the winner being selected randomly using a random number generator. Additionally, the first ten individuals to sign up for an individual follow-up interview received a $20.00 gift card as compensation for their time. The Institutional Review Board at Kansas State University reviewed and approved study protocol with exemption status (IRB-#11777).

Data Collection

Data collection took place in the fall of 2023. This study consisted of a 27-question online survey administered using Qualtrics, a secure online survey service (Qualtrics, Provo, UT). The survey duration was estimated to take 15-20 minutes to complete. Upon completion of the online survey, respondents had the opportunity to participate in an optional 10-question semi-structured follow-up individual interview. The interview duration lasted approximately 30-60 minutes. To account for time and limited resources, interviews were held virtually and were conducted through the Zoom online platform (Zoom Communications Inc, San Jose, California). For each interview, two members from the research team were present. One was responsible for conducting the interview, while the second member aided in taking notes for additional data collection. Interviews were recorded for ease of transcription and were member-checked for accuracy by the research team.

Study Measures

Survey Questions:

A 27-question online survey using the Qualtrics platform was sent out to individuals to understand multiple aspects of PA in rural LTC settings. Survey questions (See Appendix B) were adapted from previous research studies. The study's main aim was to understand facilitators and barriers to resident PA participation in rural LTC from a facility administrative perspective. Questions for facilitators *(one question)* and barriers *(one question)* were presented as matrices with a subset of Likert-based questions that were based off research conducted by Benjamin et al. (2009), and Baert et al. (2016). There were six total items for facilitators with answer choices on a 5-point Likert scale ranging from on a "strongly disagree" to "strongly agree" and nine total items for barriers with answer options on a 4-point scale ranging from "not at all a barrier" to "a major barrier." An

additional question was developed to address the second research question about strategies that would help improve resident PA participation in rural LTC *(one question)*. The "What would help PA" question was also asked using a matrix, which had nine items assessed using a 5-point Likert scale ranging from "not at all helpful" to "extremely helpful." Several yes/no and frequency-based questions aimed to examine policies and methods for promoting PA within rural LTC facilities *(four questions)* (Baert et al., 2016), and additional questions evaluated facility PA values, current resident activity levels, and facility interest in improving PA *(three questions)*. Types of PA programming *(two questions)* and equipment availability *(one question)* (Hanson et al., 2014; Wasner & Rimmer, 1997) were measured using frequency-based questions, asking respondents to "check all that apply." Additional questions grounded in past research findings strove to better comprehend PA environments with a particular interest in indoor/outdoor PA opportunities *(four questions)* and PA amenities offered to residents *(one question)* (Mahrs Träff et al., 2017; Kerr et al., 2011) by asking respondents to check what PA spaces, equipment, and amenities were offered at their facility for residents to use. Demographic information *(nine questions)* including role at facility, years at facility, number of facility residents, type of facility, and Medicaid status was also collected. As a part of the survey development process, the survey was sent to 10 individuals to test for flow and cognitive understanding. This resulted in a change in language from using the word "facilitators for PA" to "how your facility supports resident PA" to enhance readability and comprehension of the question. Originally, both the facilitator and barrier question were asked on a 5-point level of agreement scale. However, after receiving feedback, the barriers question was changed to a 4-point scale (1 = not at all a barrier, 4 = major barrier) to aid with cognitive understanding.

Optional Follow-up Qualitative Interview Questions:

An optional semi-structured 10-question follow-up interview was scheduled with interested participants. Interview questions (See Appendix C) were adapted from previous research studies conducted by Benjamin et al. (2009) that asked open-ended questions examining administrative perspectives, values, and policies that promote PA in LTC settings. Of crucial inclusion were questions that explored facilitators and barriers to PA participation, which were drawn from research by Baert et al. (2016) and Benjamin et al. (2009), with an example of a key question being: "What are some facilitators that aid your facility in promoting physical activity participation for your residents?" Additional questions addressed existing PA programming, environments, and resources available to residents (Hanson et al., 2014; Mahrs Träff et al., 2020). Lastly, the interview examined potential strategies to increase resident PA participation.

Sample Size Justification

This study is an exploratory study. Indeed, the goal is not to observe the effect size or to make any conclusive analyses. The aim of this study is to better understand the factors impacting resident PA participation in rural LTC from a facility perspective. Thus, a traditional sample size selection was not utilized. As this analysis is at the facility level, the total population, per this study's parameters, is $N=79$. It has been suggested that exploratory studies should aim to have a sample size ranging from 20-150 individuals (Daniel, 2012). Given limited time, resources, and the inherent nature of survey studies, this study aimed to achieve a response rate of 25% or $n=20$. For the optional follow-up interviews, this study sought to achieve data saturation. Based on previous research by Guest et al. (2006) and to provide the best opportunity for data saturation with the available facilities, this study strove to interview one representative from at least 12 LTC facilities (n=12).

Data Analyses

SPSS version 28 was used to perform statistical analysis. Since this is an exploratory study, descriptive statistics were run on the survey data to obtain frequencies, means, and standard deviations. Given funding was identified as a facility level barrier in previous literature, independent samples t-tests were run to explore if differences between for-profit and nonprofit facilities were present. All interview data were audio and video recorded and transcribed verbatim. Interview data were then imported into Taguette software (Rampin & Rampin, 2021) for data management and qualitative analysis. Thematic analysis was utilized for the qualitative interviews following the structure proposed by Braun and Clarke, (2006). Two individuals independently coded the data before convening to organize the data into categories and reach a consensus on final themes. In all, 92 codes were initially created, which were then grouped into 13 categories, before establishing four main themes.

Establishing Trustworthiness

This study aimed to establish trustworthiness by addressing credibility, dependability, confirmability, and transferability as proposed by Lincoln and Guba (1985). Credibility was addressed through appropriate interviewing and training techniques and peer debriefing. Additionally, all qualitative analysis was conducted under the mentorship of an experienced qualitative researcher. To establish dependability, detailed logs were kept to record the data collection process for the interviews and interview questions utilized were modified from previously published questions. This study promoted confirmability through practicing reflexivity and data triangulation. In addition to the interview audio and video recordings, field notes were taken by a research assistant and later reviewed by the coders. Additionally, the coding process

involved two coders, who analyzed the data independently before meeting to establish consensus. This study aimed to reach data saturation, which is key for transferability.

Reflexivity Statement

It is necessary that I acknowledge my background and my lens through which I reviewed the data. PA has been a part of my life from a young age. I have been involved in multiple sports, earned my bachelor's in kinesiology, became a certified group fitness instructor, and have assisted in multiple PA research projects. Upon reviewing the literature and my experience, I felt confident in my ability to examine PA as a key variable in this study. Though I have studied the field of gerontology for four years, I understand that this is not the equivalent of experiencing the impacts of aging firsthand. As I am not yet an older adult, I do not know what it is like to be limited by my health status. That said, I have worked with many older adults through volunteering within LTC and caring for my aging grandparents, one of which battled Alzheimer's disease and another who suffered from a stroke and required LTC services. Through this experience, I am aware of the health concerns that may arise during the aging process. Along with my volunteer experience, my grandparents have also lived within LTC for eight years. Thus, I have been intimately involved in the many details, decisions, and daily routines that play a role in LTC environments. Notably, I did not grow up within rural areas, but I spent many of my summers in Kansas, and I have studied within the state for the past six years. Though I may not have as in-depth of an experience within these regions, I am familiar with challenges often encountered in rural areas, the close-knit nature of the communities, and the unique assets rural towns have to offer. Additionally, knowing that my experience within this field was limited, I was intentional during the interview process, asking if there was anything I should know that was not previously addressed during the interview. In doing so, I was given rich insight and beneficial context in which to understand the research question.

Chapter 4 - Results

Quantitative Results – Survey

All 79 facilities were called (Figure 3.1), 64 facilities received the survey, and 33 facilities responded. Two surveys were excluded from final analysis because they were incomplete or a repeat facility. Incomplete status was determined based on if 50% of the survey was completed. Thus, the total sample used for data analysis was (n=31) surveys, which yielded a survey response rate of 48.4% and a total of 39.2% of all facilities reached.

Figure 3.1 – Survey Distribution Diagram

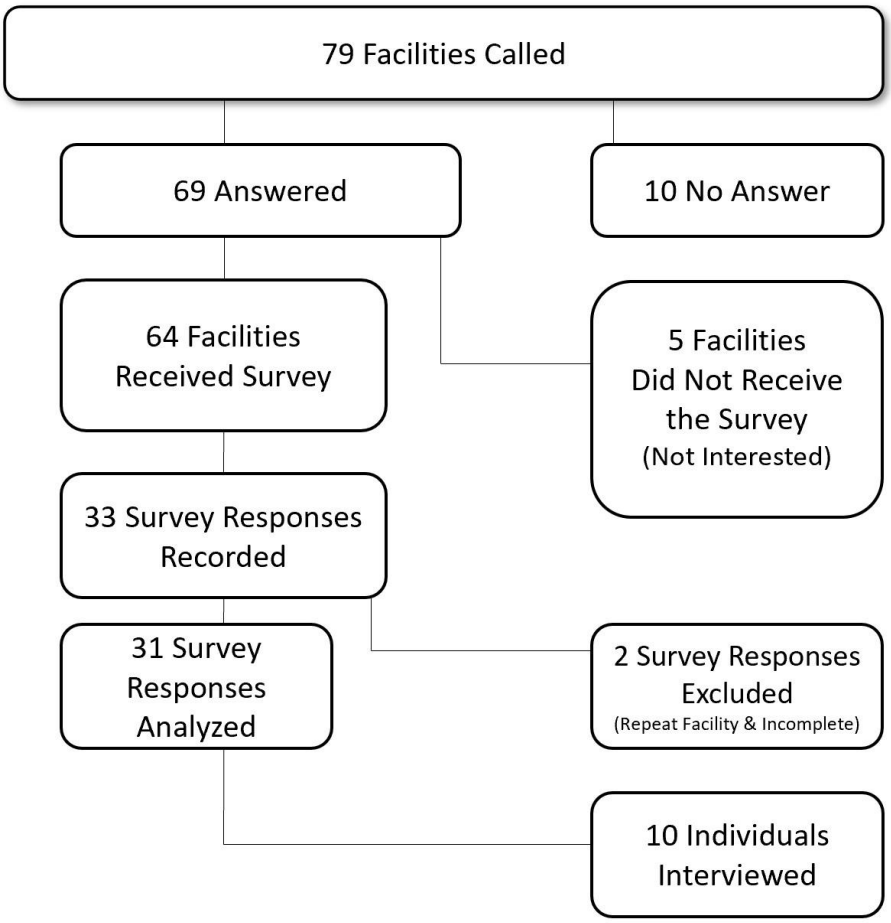


Table 1.1 outlines survey respondent demographics. The majority of respondents were facility administrators (54.8%) and had over five years at their respective facility (58.0%). Almost half the

facilities labeled themselves as skilled nursing facilities (48.3%), and most facilities had at least 31 residents living at their facility (70.9%). Just over half of respondent facilities were for-profit (51.6%), and 93.5% accepted Medicaid. The majority (55.2%) indicated a large portion of their residents (51-75%) were on Medicaid.

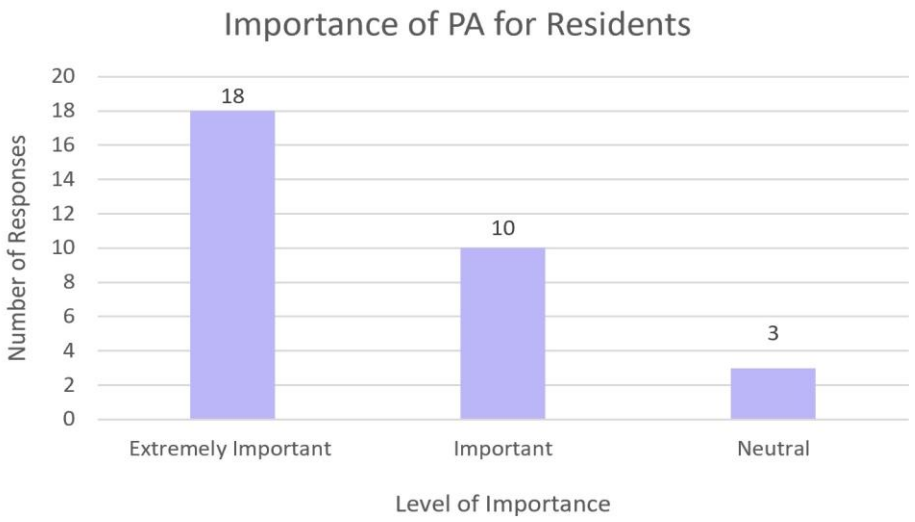
Table 1.1 – Demographics

	Total (n)	Percentage (%)
Facility Position (n=31)		
Facility Administrator/Coordinator	17	54.8
Activities or Social Director	6	19.4
DON/ADON	5	16.1
Wellness Director	2	6.5
Other	1	3.2
Years of Working at the Facility (n=31)		
6-11 months	2	6.5
1-2 year	7	22.6
3-4 years	4	12.9
5+ years	18	58.0
Facility Type (n=31)		
Assisted Living	9	29.1
Skilled Nursing	15	48.3
Both	7	22.6
Approximate Number of Residents (n=31)		
11-20	2	6.5
21-30	7	22.6
31-40	11	35.4
41-50	7	22.6
51+	4	12.9
For-Profit (n=31)		
Yes	16	51.6
No	13	41.9
Don’t know/unsure	2	6.5
Accept Medicaid Funding (n=31)		
Yes	29	93.5
No	2	6.5
Percent of Residents on Medicaid (n=29)		
1-25%	5	17.2
26-50%	3	10.3
51-75%	16	55.2
76-100%	4	13.9
Don’t know/unsure	1	3.4

Respondents noted PA is of high importance (M=4.48±0.68/5) (Figure 4.1). Resident activity levels ranged between sedentary to moderately active, with the majority (51.6%) indicating

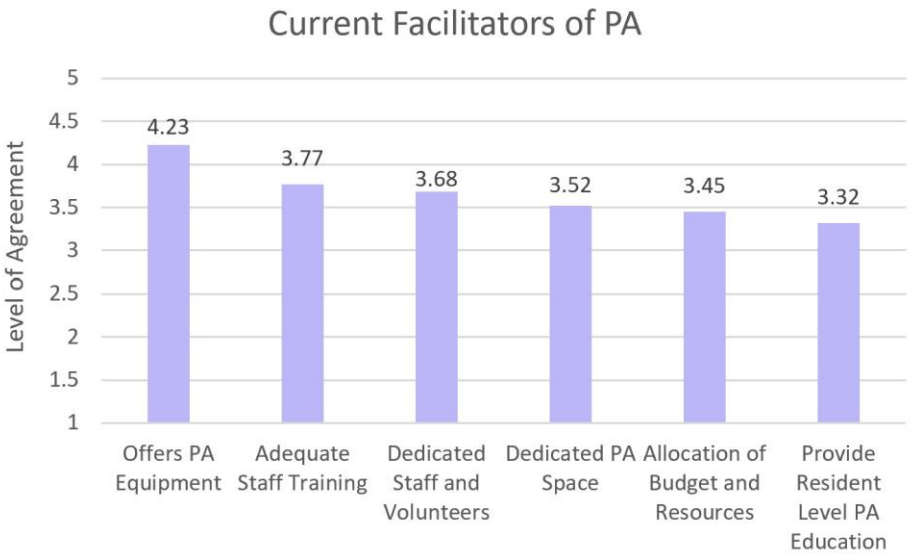
residents get little to no activity, while 48.4% stated their residents were moderately active. No respondents marked their residents as vigorously active.

Figure 4.1 - Importance of Physical Activity for Residents



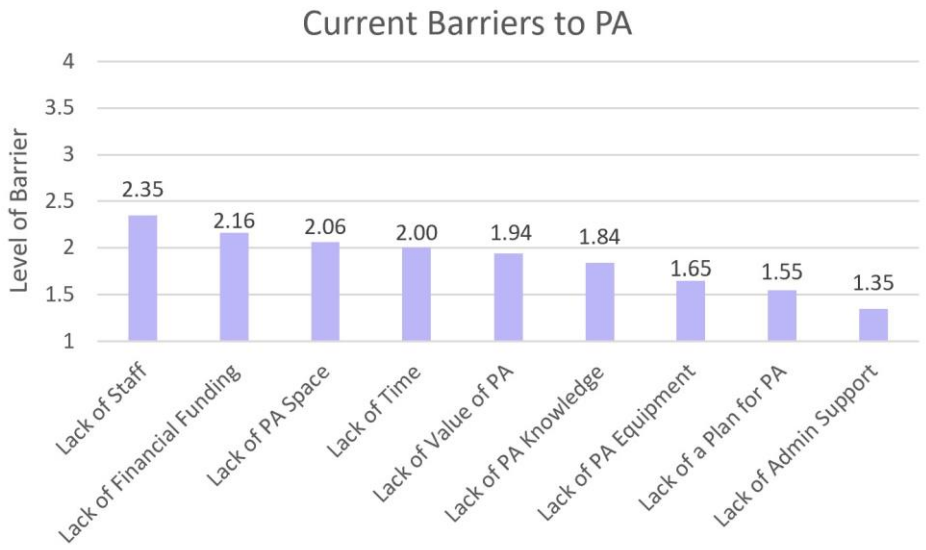
Responses from the survey indicate a variety of current facilitators (Figure 5.1) and barriers (Figure 6.1). Respondents showed agreement (e.g., having a mean of three or higher on a five-point scale) towards availability of PA equipment, adequate staff training, dedicated staff, and space for PA being supporting factors for PA participation. Respondents noted several existing barriers, but no barrier had a mean above a 2.3 out of 4. Barriers included staffing shortages, lack of funding, and absence of dedicated PA space. Additional barriers were time constraints, organizational value of PA, and inadequate PA knowledge. Over three-fourths of respondents (77.4%) indicated they had policies in place to promote resident PA participation, and 87.1% had existing PA programming for residents.

Figure 5.1 - Facilitators for Physical Activity



Response scale: (1 = strongly disagree, 5 = strongly agree)

Figure 6.1 - Barriers to Physical Activity

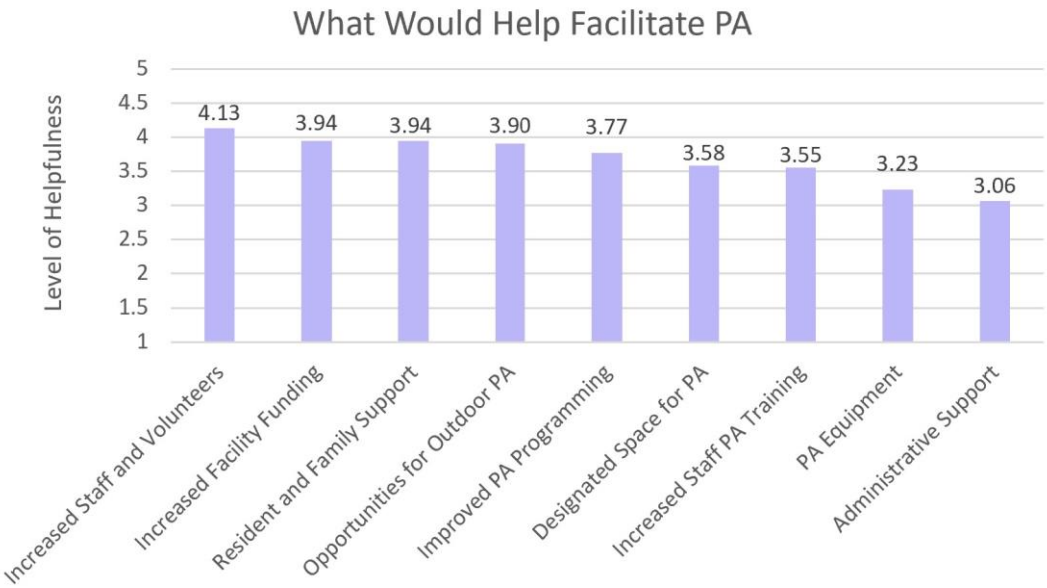


Response scale: (1 = not at all a barrier, 4 = major barrier)

Respondents highlighted what factors would be helpful in promoting PA at their facility in the future (Figure 7.1), with additional staffing, increased funding, and greater family and resident involvement being among the top responses. Additionally, increased outdoor PA opportunities, improved PA programming, and designated space for PA were potential factors to improve resident

PA participation. Respondents showed high interest in including more PA opportunities for their residents in the future (*M*=4.23±0.76). Independent samples t-tests showed significant differences between for-profit (*n*=16) and nonprofit facilities (*n*=13) in two areas. For-profit facilities were less likely to need increased staff and volunteer help to facilitate PA participation (t(27) = -2.48, *p* = .021), and they are more likely to have higher administrative support for offering PA programming (t(27) = 2.37, *p* = .025). No other significant differences between for-profit and nonprofit were found.

Figure 7.1 - What Would Help Facilitate Physical Activity



Response scale: (1 = not at all helpful, 5 = extremely helpful)

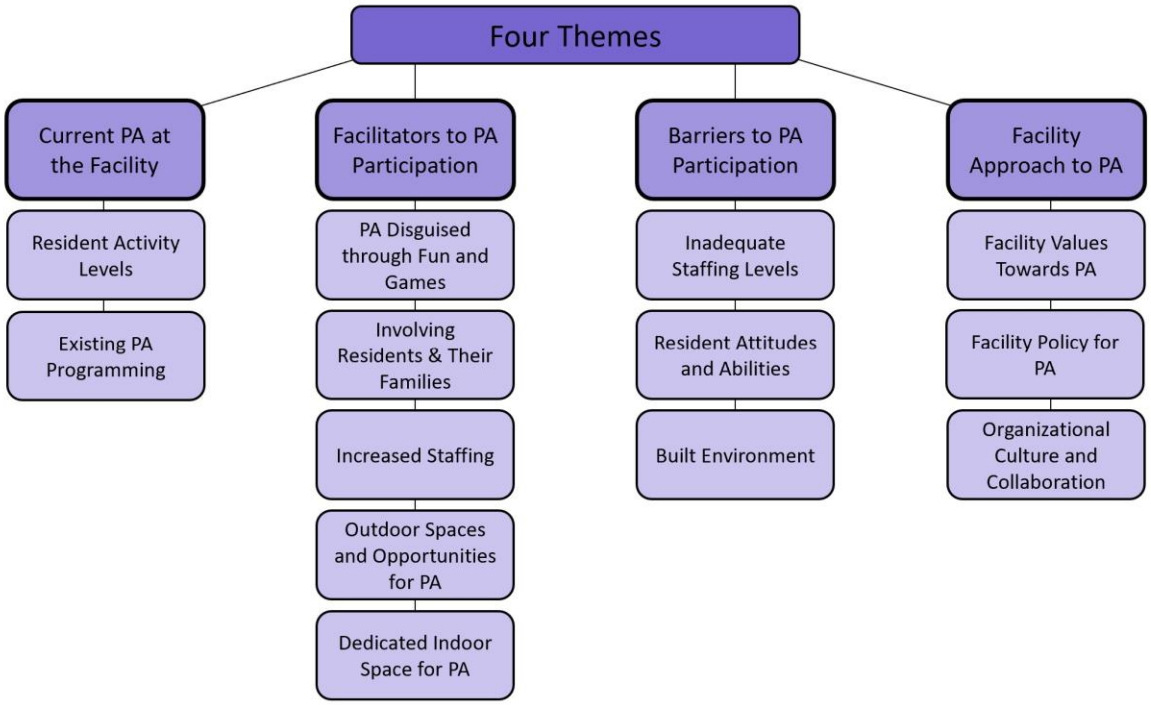
Qualitative Results – Interviews

Ten individuals (n=6 administrators, n=4 activities directors) who completed the survey also agreed to participate in an individual follow up interview. Interviews ranged from 30-70 minutes (*M*=45.6±12.8 min). Qualitative exploration of facilitators and barriers to PA in rural LTC environments resulted in four themes and 13 categories described in detail below.

Theme 1: Current Physical Activity at the Facility

The first theme outlines existing resident activity levels and programming at the facility and how PA is often integrated into daily activities. It has two categories and highlights what resident PA is currently like in rural LTC.

Figure 8.1 - Qualitative Overview



Resident Activity Levels:

Resident activity levels varied across facilities. One administrator stated, *"They're not super active (S3),"* while an activities director noted PA levels ranged from *"Light to moderate (S6)."* The trend seemed to be that most activity was *"probably light activity (S5),"* with one administrator acknowledging that *"They're not as active over there as they used to be (S8)."* Several noted that incorporating PA into ADLs made it easier to integrate into daily routines, with one administrator saying, "*We've kind of built it into [the day]. Getting them up or putting them to bed, or the walk to dine program is when they can get that activity in, that exercise… (S4)."*

Another administrator mentioned how morning routines included *"Stretching… while they're getting dressed and things like that (S10)."* PA is not always something that is programmed, but often a part of the everyday routines as one activities director noted, *"Physical activity, it's going on every single day. It might be just little things, but yeah, they're moving in a group and [moving] every day (S9)."*

Physical Activity Programming:

PA programming varied in frequency, duration, and type, but many aimed to have some form of daily exercise. One facility has *"Chair exercises Monday through Friday (S7),"* while another usually does *"Either morning stretches or some exercises, or just a little workout for about 15-20 min, two to three days a week (S5)."* Some are more structured in that they have a set time for activity. One administrator said, *"Every day at 10 o'clock from 10:00 to 10:30 we do exercise (S1)."* Other facilities are more flexible in when PA is offered and in the type of PA, with one activities director noting, *"You know, daily exercise programs, walking, events, and activities that incorporate them to move. We really encourage them to get up and get out (S6)."* Sittercise emerged as a common class modality offered with one administrator noting, *"We have an activity group a couple of times a week, like some sittercises, but that's really it (S10)."* Other facilities have branched out to other activities, such as dance classes, with one activities director highlighting:

> *That they do a seated dance class… She went and found some scarves and tied them to the end of a drumstick. They swing those around and make circles and different things… They're doing this and that, and they don't realize they're doing extra little movements and stuff, but they love that dance class (S6).*

Exercise videos were also a popular modality with one administrator stating:

> *I have exercise program on Wednesdays and Fridays on the video in the chapel and then on Tuesdays, Thursdays, and Saturdays, I run it across the TV screen… So, they've got plenty of exercise they can do as an exercise program (S4).*

Theme 2: Facilitators to Physical Activity Participation

The second theme is facilitators of PA in rural LTC settings, which has five categories that provide insight into factors that help facilities promote PA for their residents: PA disguised through fun and games, involving residents and their families, increased staffing, outdoor spaces and opportunities for PA, and dedicated indoor space for PA.

Physical Activity Disguised Through Fun and Games:

Making PA fun emerged as a critical component for promoting PA within rural LTC environments. One administrator noted, *"They really like when you make their exercise a game. So, when you're playing games more than anything just because they don't really realize that they are actually exercising, (S10)"* while one activities director highlighted how residents respond better to the non-traditional forms of activity that encourage a sense of competitiveness:

> *Honestly, it's the balloons and noodles or the volleyball, you know, anything active as a group. I'd made something for them to bowl, rolling a golf ball down a piece of pipe, you know, and just getting them active and laughing and even the competitiveness of some of these old people is really fun to watch (S2).*

An additional response demonstrated the importance of fun when motivating residents to be active stating, *"If it's not fun, they're not going to do it. It becomes a job; it becomes something that they don't care to do. (S9)"* This sentiment was supported by an activities director who affirmed:

If it's fun, they're going to do it and not realize that they're exercising their muscles… You know, if you incorporate things that make it fun, then they're all for it, and they'll do it every single time (S1).

Administrators and activities directors expressed that the term 'exercise' often held a negative connotation for LTC residents, and they are less inclined to participate:

I think they prefer the relay races and hula hoops, stuff like that. Yeah. I think that they enjoy the more creative ways, and they don't realize that that's what they're doing. You know, there are some that are like ugh, exercise… but when we have fun exercises and activities, they're the first ones down there (S5).

Adding a sense of gamification or labeling exercise as something else was a common strategy with one administrator stating, *"It seems like if you call it "sittercise" or exercise, they won't come, but if you call it what game you're playing… they're more likely to come and play the game rather than come to exercise (S4)."* Another administrator agreed with this sentiment and noted the need for the activities to be age-appropriate claiming, *"Anything disguised as something else really. Like if it's fun and appealing and adult. Then, that's what they'll like (S3)."*

Involving Residents and Their Families:

Family and resident involvement played a key role in getting residents to be active. One activities director noted that *"Family cooperation helps with getting their loved ones up and active out of their rooms* (S2)*."* Another mentioned finding success by involving family in the discussions about activity stating, *"We're always willing to get feedback from family members because I mean, they know them best" (S5)*, which demonstrates how family proximity can be valuable to increasing PA participation. Additionally, one administrator mentioned the value of involving residents in activity decisions stating, *"So they [the residents] are kind of involved in what things*

we continue to do… (S4)," which gives the facility insight into developing programming. Lastly, promoting resident choice is critical with one activities director mentioning how they strive to ensure that they *"Give them something, give them choices to make sure that they are the ones that are making the choice (S6)."*

Increased Staffing:

Increased staffing was a notable facilitator that many facilities expressed the desire to have, with one administrator stating, *"I think you definitely kind of have to have all the staff. That really helps to have more hands-on [activities]… more staff participation too (S7)."* Another administrator mentioned wanting to *"have as many people that work with them on [PA] (S8),"* while an activities director stated that *"more staff and more time (S5)"* were necessary to successfully promoting and implementing PA within rural LTC.

Outdoor Spaces and Opportunities for Physical Activity:

Outdoor opportunities were marked as a notable contributor to resident PA participation. One administrator noted the positive effects being outside had on residents:

> *Honestly, when it all is said and done, the best thing you can do is get them outside. It's the best. The best way to get activity in is to go out and to get fresh air. It rejuvenates the body, the mind, and the soul (S1).*

Having the outdoor built environment was another factor that allowed facilities to have activities, such as gardening with one participant noting, *"They like helping plant a small garden in the spring. It gives them exercise to go out and help with it (S8),"* while one activities director mentioned how having the outdoor space allowed them to play various types of sports with the residents:

We have a lot of property… so basically, they take them for walks on the sidewalk. I remember this last summer, they actually took them out, and we emptied up the parking lot over here adjacent to the building, and they played baseball (S6).

Another administrator highlighted how outdoor PA was beneficial in helping residents target certain ADLs stating, *"We have a back courtyard that's really nice that we take them out, and we'll play ball and stuff out there. Lots of catch because it's good hand-eye coordination (S1)."*

Dedicated Indoor Space for Physical Activity:

Having a dedicated space for PA was often linked to resident PA participation. One administrator mentioned having an all-access activity room that allowed residents to be active whenever they wanted stating:

"In the activity room, that's open 24 h. So, they always have access to that, and we have our bike actually set up… So, our facility looks over a lake. So, they can bike and look out at the lake, and all the wildlife that's out there (S10)."

Another described how their facility design facilitated residents' ability to walk indoors noting:

"We have the hallways marked with little vinyl pink feet every 25 feet, so that they can see how far they've walked and our building kind of has a square so we have some of our residents walk the square…(S4)."

Other participants expressed wanting more space with one saying, *"I would love to have another wing just for physical activity. I'd like to have a gym. That is probably three times the size of the one I have now, (S1)"* while another stated, *"Space. More space would be nice sometimes (S6)"* in order to promote PA for residents.

Theme 3: Barriers to Physical Activity Participation

The third theme is barriers to PA in rural LTC settings, which has three categories that reveal challenges facilities encounter to promoting PA for their residents including: Inadequate staffing, resident attitudes and abilities, and built environment.

Inadequate Staffing:

Staffing emerged as a frequent barrier to promoting PA in LTC, with one administrator stating, *"I think really our biggest barrier is just staffing (S4),"* while another agreed that *"staffing is an absolute barrier (S3)."* One activities director identified how staffing is integral to accomplishing PA goals, claiming, *"Basically, it all comes down to staffing. We have all the departments; we have all the things. We just don't have the staff. It's honestly our biggest issue. It's just the staff (S5)."* Another activities director pointed out how the rurality of the facility's location may play a role in inadequate staffing stating, *"I do think the biggest problem in rural areas, if you just talking about medical or nursing home in general, is staffing (S2)."* The challenges of staffing shortages impacted resident PA in terms of having time in the schedule or time to spend with the resident, with one activities director noting, *"It's hard to find a time to sneak [PA] in (S9),"* while one administrator highlighted how offering consistent PA opportunities is impacted noting, *"In terms of physical activity, we haven't been as consistent this month just because of staffing issues (S8)."* Staff often have multiple roles in responsibilities, which leads to decisions that may lead to PA participation for residents to be deprioritized:

> *Most of the time it is easier to push a resident in a wheelchair down the hallway. It's a lot faster. And you get them to where they're going, and you don't have to walk with them. So, I see that sometimes, where somebody can walk, but [the staff] push them in a wheelchair*

because it's faster and more convenient. Things like physical activity do get put on the back burner (S7).

One activities director expressed a similar sentiment in that *"Physical activity has to take a step back just to make sure that their medical care and things like that are getting taken care of (S5)."* Other responsibilities and priorities take precedent, and often, there is not enough time in the day to ensure all the residents are physically active.

Resident Attitudes and Abilities:

Residents' lack of motivation to participate in PA was cited as a common barrier with one activities director saying, *"As far as the physical activity, most of them just say I'm too old to do that… I did that when I was younger and now I just, you know, I just don't feel like it (S6)."* An administrator expressed that despite staff desire for their residents to be active, *"Some of them don't want to be active and won't be (S8)."* Getting residents motivated to get up and out of their rooms is a barrier, with one activities director saying, *"There's a few you have to coax, and you know, try to get them to come down and do physical exercise (S2)."* Beyond lack of interest and motivation, resident health status and related abilities play a significant role in PA participation. One administrator stated, *"Yeah, health status is the worst (S1),"* while another stated, *"Their bodies don't always work the way they want them to. Their mind might still be there, but they physically can't. (S8)."* One administrator expressed how chronic health conditions make it challenging to get residents to participate in regular paying describing how it often makes even ADLs difficult revealing, *"You're dealing with people that walk from a chair over to the toilet, and they're out of breath. It's gonna be pretty hard. I mean, we got COPD and… lung diagnosis and cardiac conditions (S7)."*

Built Environment:

Lack of space was often noted as barrier to PA by facilities. One activities director mentioned how, *"We just don't have the space (S6),"* while one administrator stated that even though they had a gym, it was a *"very small gym (S10),"* which often prevented consistent PA participation. A complete absence of space was common with one administrator stating, *"We don't have a fitness facility (S4)."* The age and size of the facility was also a factor with one administrator revealing, *"You know, space wise, yeah, our facility isn't a big facility. Our building is probably 60 years old (S3),"* which has a negative impact on PA.

Theme 4: Facility Approach to Physical Activity

The fourth theme is how rural LTC facilities view and approach PA for their residents. It has three categories that describe organizational level characteristics that influence resident PA participation.

Facility Values Towards Physical Activity:

Rural LTC facilities expressed a strong value for PA and the benefits that it provides residents. One administrator noted that they are *"Very big on the if you don't use it, you'll lose it sort of thing… (S4)."* Another stated how they were *"definitely focusing on the physical activity and exercising" because it keeps them from a faster decline (S10)."* One administrator emphasized the importance of keeping their residents as active as possible noting, *"The better the activity, the better the brain. And you can actually see improvement in people if you get them active (S1)."* One activities director expressed the role of PA in terms of resident quality of life saying, *"If you take activity and physical activity out of their daily life, then, they're just sitting there, and that's not how anybody wants to live their life (S5)."* A similar connection between PA and resident satisfaction was made by another activities director:

It is very important, very, very important to keep them up and moving because when they stop moving, they'll give up, and then it won't be long after that. I know from working here and doing it. The more excited they are and the happier they are, they seem to do better and they live longer (S9).

Facility Policy for Physical Activity:

Facility policies for PA take shape mainly in the form of residents' rights and care plans. Care plans serve as a way to assess resident needs and note any changes in their condition. When approaching PA, LTC facilities prioritize resident autonomy. One administrator mentioned how, *"Residents' rights override about anything we can do (S8)."* It was reiterated how LTC environments stress *"The right to choose (S3),"* meaning *"If you offer them to go do something, and they don't want to do it like it kind of begins and ends there (S3)."* While many of the individuals interviewed know the importance of PA, one activities director highlighted how residents *"Have to be willing to do it (S5),"* and they *"Can't tell them they have to (S5),"* which plays a big role in how PA participation is approached in LTC facilities. Resident care plans were cited as a way to integrate PA into residents' routines, with one administrator mentioning how *"One of our basic care plans that we do is about their activity level (S10)."* Another administrator highlighted how they include PA through *"therapeutic work orders (S7),"* which allows residents to be out in the gardens. Care plans are often a way to involve the resident, family, and the facility, which then helps determine how to best facilitate PA for the resident, with one administrator describing how it is a collaborative effort between the facility, the resident, and the resident's family:

We kind of discuss [PA] and talk about those things. When I'm at care plans, I ask what cares are they independent of? How many feet are they walking? What's a goal maybe that

they could do? Or you know we've noticed that your loved one doesn't seem to be able to walk all the way to the dining room anymore. Should we do some therapy or let's get them encouraged to maybe walk to meals and get that strength back up (S4).

Organizational Culture and Collaboration:

Organizational culture and collaboration help facilities create an environment where PA is supported and encouraged. Having dedicated staff that create a culture of movement and activity is a large influence on resident PA. One activities director noted how their staff is *"All about keeping people active because once you don't, [the resident] just kind of go[es] downhill pretty quickly (S2)."* Another activities director remarked how their staff is *"Willing to go above just their basic CNA job. They want to do more than just that (S9)."* The desire to help residents is a key characteristic to promoting PA as one activities director stated, *"I'm really lucky in that instance that everybody wants to help the residents (S5)."* Beyond having dedicated staff, teamwork and communication were identified as useful for promoting PA with one administrator noting, *"The most successful [facilities] are the ones that have the greatest teamwork (S8)."* One activities director expressed similar sentiments regarding the value of teamwork saying:

It can't be just one person. It's gotta be the team. It takes a village to raise a child, and it takes a village to take care of the elderly. And you gotta wanna do it, and that's the key. You gotta hire the right people (S9).

Communication between staff members and administration plays a role in helping residents be active. One administrator emphasized the importance of team buy-in and how that helps with the creation of new ideas saying:

The first thing you have to do is get the staff to believe…. You let them have a point and have a say. They feel like they believe, and it just takes off. Pretty soon everybody's trying to come up with new ideas (S1).

Communication between shift aids about resident PA behavior helps facilitate resident activities with one activities director noting:

Usually, we're really good, as a staff, of letting others know. There will be a nurse, or there will be someone that will step in and say, 'so and so hasn't moved much today,' or 'they haven't walked at all…' That way, we know. They will let the second shift come on and let them know, so that way they can try to pick that up (S5).

Staff encouragement and involvement go a long way in helping to promote resident PA participation. One administrator expressed how staffs' words of encouragement and their hands-on approach is beneficial for getting residents up and moving:

I mean, I think everybody's just really good about being encouraging to residents and, you know, always encouraging them to do it for themselves and really promoting, 'you can do it,' you know, 'I'll show you,' 'I'll help you and then you can see that you can do it (S4).'

An activities director pointed to the intimate setting of rural LTC, where the residents feel like family to the staff, and how those unique relationships help facilitate encouragement of PA revealing:

We're very close-knit and everybody does their part. We have nurses, we have med aides. Everybody will be like, hey, 'I heard that you didn't get up and go do this yesterday.' Or 'you didn't ride your bike yesterday,' or 'yesterday you said that you wanted to get up and ride the bike, so why don't you go ahead and do it today? It would be good for you' (S5).

One activities director highlighted resident education in addition to encouragement as important factors to promoting PA stating, *"I guess that's the biggest thing is just always encouraging and educating your residents (S6)."*

Chapter 5 - Discussion

Given the paucity of data regarding PA in rural LTC, there is first a need to better understand what the facilitators and barriers for resident PA are before solutions can be presented. Thus, this exploratory study aimed to understand the facilitators and barriers to resident PA in rural LTC from a facility administrative perspective in a step to help fill the gap that exists within current literature. Surveys and in-depth interviews with individuals holding administrative positions in rural LTC facilities explored two specific research questions:

- What are the facilitators and barriers to resident physical activity participation in rural long-term care facilities from a facility perspective?
- What are the strategies on how to improve resident PA participation in rural long-term care from a facility perspective?

Facilitators to Resident Physical Activity Participation

Survey respondents demonstrated mild to moderate agreement that availability of PA equipment, staff training, dedicated team members, and designated space were among existing facilitators for PA at their facility, all of which were similar to findings presented in previous studies conducted in urban or suburban LTC settings (Hawkins et al., 2018; Mahrs Träff et al., 2020; McArthur et al., 2021; Resnick et al., 2008). Interviews with facility administrators and activities directors provided an opportunity to explore the facilitators to PA within rural LTC in a more in-depth manner. Overall, the interviews supported survey findings while providing greater context to the factors that aided in PA promotion within rural LTC. In terms of facilitators, administrators and activities directors agreed that additional staffing, dedicated space, and increased funding would help residents be active, which aligns with previous findings by Baert et al. (2016) and Harris-Kojetin and Zimring (2006) who found that having adequate space

designated specifically for PA, staff dedicated to PA, and appropriate funding were helpful in promoting PA for residents. The interviews offered the opportunity for administrators and activities directors to give insight into the importance of organizational culture. Having open channels of communication, encouraging collaboration and teamwork, and motivating residents were notable components of organizational culture that aided in promoting PA in rural LTC facilities. This is similar to what Resnick et al. (2006) found in their study, noting that communication and teamwork are critical components to implementing restorative care within general LTC settings. Resnick et al. (2006) focuses specifically on restorative care and does not account for possible rural geographic influences. Thus, the current study adds to the literature by providing evidence that creating a supportive culture for PA through communication and teamwork is just as important in rural LTC as it is in more suburban and urban LTC settings. Notably, the interview results reaffirmed the importance of outdoor PA opportunities and how outdoor activity helps residents be active, which is supported by previous studies conducted in suburban, urban, and rural environments that demonstrated how outdoor environments are linked to greater PA participation and well-being in older adults in LTC (Joseph et al., 2006; van den Berg et al., 2020). Interview findings also confirmed that greater family and resident involvement would be beneficial in helping to increase PA participation at their facility, which is similar to findings presented by Guerin et al. (2008) who highlighted family support as a potential facilitator for older adults attending exercises classes in urban LTC settings. Galik et al. (2009) also mentioned the importance of getting to know the residents and involving them in the process of restorative care. Though Galik et al. (2009) did not particularly focus on rural LTC, nor PA, the findings from the current study of PA in rural LTC demonstrate that similar strategies can be applied across settings and activities. Additionally, a notable finding from the current study is the role fun and enjoyment

play in PA participation in rural LTC. Administrators and activities directors highlighted how making PA fun was the best way to get residents out of their rooms and be active. Adding hula hoops, pool noodles, elements of competition, and music were helpful factors in increasing PA participation. The gamification of PA serves as a key mechanism of disguise and allows residents to feel like they are not exercising. Though focused on restorative care, Galik et al. (2009) noted how utilizing humor and play helps motivate older adults in LTC to participate in restorative exercises. Thus, it makes sense that including elements of fun would extend to PA within LTC as well. Additionally, De Souto Barreto et al. (2016) showed how innovative and fun activities could be used to increase resident activity levels. The current study supports this idea by demonstrating how moving away from the term "exercise" and more towards fun activities and movement may be beneficial in increasing resident PA participation within rural LTC settings. In all, the facilitators for PA found in this current study align with previous research studies conducted in LTC environments located within different geographic settings. This study adds to the existing literature by providing a foundational understanding of facilitators to resident PA in rural LTC.

Barriers to Resident Physical Activity Participation

Surprisingly, survey results showed that none of the barriers were higher than "somewhat of a barrier." Staffing, funding, space, and time were among some of the highest rated barriers. However, they all fell in between the minor to moderate barrier category. Although survey results indicated the above factors were only mild to moderate barriers, the individual interviews told another story. Administrators and activities directors discussed staffing as a persistent and substantial barrier. Staffing shortages were mentioned in nearly every interview, and multiple administrators and activities directors indicated how staffing challenges impacted the consistency and the ability to provide PA for residents, which is in line with previous literature that found

staffing to be a major barrier within more suburban and urban LTC facilities (Benjamin et al., 2009; Benjamin et al., 2014; McArthur et al., 2021). This demonstrates a discrepancy in the magnitude of the barriers between the survey and the interview. The interview process likely allowed for a more contemplative assessment of staffing as a barrier to PA promotion and participation compared to barriers listed in the survey. Interestingly, survey results indicated staffing may be more of a manageable barrier for for-profit facilities. The interviews also provided the opportunity for administrators and activities directors to elaborate on additional barriers, such as resident attitudes and beliefs, that were not previously addressed in the survey. Indeed, lack of resident motivation and health status were consistent barriers to resident PA participation that administrators and activities directors discussed during the interviews that were not listed in the survey. Both resident motivation and health status have appeared as barriers in past studies conducted in rural, suburban, and urban settings (Arıkan Dönmez & Aslan, 2023; Guerin et al., 2008; Phillips & Flesner, 2013), indicating not all barriers are at the organizational or policy level. Though dedicated space was said to be a mild to moderate barrier in the survey responses, the interviews allowed administrators and activities directors to expand upon the built environment as a barrier. Multiple individuals remarked how they lacked the physical space to hold PA sessions, or that their building was not designed with PA in mind, which helped to clarify the results found in the surveys. The current study adds to the current literature by outlining the existing barriers to PA in rural LTC, which were found to be similar to barriers in suburban and urban LTC settings. This means that potential strategies utilized within suburban and urban LTC facilities may be effective within rural LTC facilities as well.

Strategies to Improve Resident Physical Activity Participation

The current study examined existing PA levels and aimed to understand strategies to improve resident PA participation. Survey results indicated that facilities value PA for their residents, but over half of the respondents noted their residents were mainly performing sedentary to light activity. When discussing residents' current activity levels during the interviews, administrators and activities directors expressed similar sentiments in that PA was important for their residents. Overall, they felt their residents did mostly light activity, with few in the moderate category, which serves to support the results found in the survey. The consensus among those interviewed seemed to be that residents were not as active as they should be, which coincides with previous research studies conducted in rural and suburban LTC settings (De Souto Barreto et al., 2015; Resnick et al., 2018). Thus, there seems to be a disconnect between the value of PA and the ability to promote and implement PA for residents. One reason for low PA participation could be that existing structured PA programming in the facilities interviewed was typically video exercises or “sittercises.” Past research indicates that one size fits all style programming, like “sittercises,” has been linked to resident dissatisfaction (Kalinowski et al., 2012; Webster et al., 2023), which further supports the case for improved programming and making PA enjoyable as targetable strategy to increase PA for residents in rural LTC. Survey results also indicated for-profit facilities may have more support and resources for PA programming, which means nonprofit facilities may need additional assistance to enhance their PA programming. The survey revealed most facilities have policies in place for PA, and many agreed those policies help promote PA for their residents. During the interviews, administrators and activities directors were also encouraged to expand upon the presence of PA policies indicating that integrating PA into care plans and ADLs were generally effective strategies to increase resident PA. The survey results highlighted what would be helpful

to promote PA in the future, with more staffing and volunteers being marked as top strategies for increasing PA. The remaining prompts fell between being "somewhat helpful" and "very helpful," which demonstrates a need and a desire to address PA within rural LTC environments. Additional potential strategies that would help improve PA were increased funding, greater family and resident support, more outdoor opportunities for PA, improved programming, and designated space for PA. Interestingly, staff training for PA and administrative support were marked the lowest at just above the threshold of "somewhat helpful," which may relate back to how these two factors were already considered to be existing facilitators. These findings coincide with previous research conducted by McArthur et al. (2021) who outlined how facility leadership and staff training are key components in LTC. While McArthur et al. (2021) refers to factors contributing to the implementation of evidence-based practices in LTC in general, this study helps to confirm that similar factors in terms of leadership are important and can apply to PA promotion within rural LTC as well.

It is important to consider facilitators, barriers, and strategies across many levels of the socio-ecological model, including the individual level when promoting and addressing PA within rural LTC. Data from this study help to answer both research questions by highlighting various facilitators and barriers that span multiple levels, and also point to several possible strategies that could help promote resident PA participation within rural LTC in the future.

Strengths and Considerations

This study has several strengths and limitations for consideration. Historically, defining rurality has been a challenge, as it often varies (Bennett et al., 2019). Rurality was determined using U.S. Department of Agriculture Rural-Urban Continuum Codes from 2013, but these codes were recently updated in February 2024 shortly following the completion of this study's data

collection. The codes used in this study were compared to the updated 2024 version, and no changes occurred, increasing confidence that the component of rurality evaluated in this study was the most up to date. It is worth noting that given the varying definition of rurality, it is possible some rural areas were missed. The RUCC codes outline a continuum of rurality, whereas the U.S. Census Bureau defines rural as "all population, housing, and territory not included within an urban area" (U.S. Census Bureau, 2023), which essentially translates to anything that is not urban. This broad description of rural further highlights how there is no single definition of rural that is used across agencies. To add to the complexity, rural can also be relative based off individual perspectives. Thus, given the varying definitions of rurality, it is possible some rural areas were missed, which somewhat hinders generalizability of the study's findings. Additionally, the study's parameters were limited to assisted living and skilled nursing facilities only, which means some facilities, such as residential care homes (≤20 beds) were excluded. That said, assisted living and skilled nursing facilities tend to be the most common choice for LTC, and their utilization is projected to triple by 2050 (PAHO, 2019), which points to the importance of studying the setting of LTC. A strength to this study is its mixed methods study design. This allowed for a more comprehensive understanding of current facilitators and barriers experienced in rural LTC. It is important to note the survey utilized was created for this study and had not been previously validated, which may have affected the ability to fully determine the validity, reliability, and magnitude of the facilitators and barriers presented. As indicated by the interviews, responses on the barriers scale appeared to underestimate the magnitude compared to interview findings. This could be because the survey questions did not fully capture all the facilitators and barriers to PA that rural LTC facilities encounter. That said, survey (items and scales) and interview questions were derived from previous research studies conducted in similar settings, which aids the ability

to make comparisons to previous literature. Despite basing survey and interview questions on relevant existing literature, the exploratory, cross-sectional nature of this study's data could be viewed as subjective. Thus, there is a possibility for self-report bias and social desirability that could impact the reliability of results. To combat this, this study aimed to establish credibility and trustworthiness in its qualitative data by following established procedures outlined by Braun and Clarke, (2006), which was previously discussed in the study's methods. However, the mixed methods study design allowed for both quantitative and qualitative data, which supports validity of findings by building a comprehensive understanding through contextualized results. The interview data also allowed for rich in-depth analysis of various facility and individual level components impacting resident PA in rural LTC, which served to support and clarify the results of the survey. This study had a small sample size (n=31); therefore, findings cannot be generalized to all rural areas across the nation. However, it is important to note that this study was conducted at the facility level, meaning nearly 40% of the rural LTC facilities (as determined by this study) in the state of Kansas responded to the survey. The results must also be reviewed through the lens of COVID-19. Many LTC facilities were severely impacted by the pandemic, which only exacerbated PA challenges (Fish & Trejo Tello, 2023). Many of the administrators and activities directors interviewed mentioned having to rebuild resident confidence after COVID-19 to get them up and moving out of their rooms. This demonstrates how there are still lingering psychological effects of the pandemic, which may impact PA participation in rural LTC.

Implications and Future Research

Findings from this mixed methods research study help to fill in the gap that exists in current literature around PA in rural LTC. There is now a better understanding of what facilitators and barriers to resident PA look like in rural LTC, which provides a foundation to build upon. Staffing,

funding, and space emerged as substantial barriers. It is possible these barriers could be addressed at the facility level through policy by creating funding allocations for activities and staffing requirements specifically for PA. The precedent exists for similar programs like restorative care after the passage of the 1987 Omnibus Reconciliation Act and subsequently the under the Medicare Skilled Nursing Facility Prospective Payment System (CMS, n.d.). This means there is a potential blueprint to follow, so that PA can be more consistently integrated into rural LTC. Policy also has the potential to address the lack of space by outlining updated design and space requirements for PA at facilities. Findings from this study highlight the importance of organizational culture in PA promotion in rural LTC. Facilities need to have supportive administrators, effective team collaboration, and offer positive reinforcement to residents. Lastly, there is a need for improved PA programming within rural LTC that includes elements of fun, the implementation of which is closely tied to staffing, funding, and space. While evidence-based programming is recommended for the older adult population, this study demonstrates a need for a sufficient blend of fun and structured exercises. Thus, there needs to be programming that integrates evidence-based principles and components of fun to ensure adequate activity levels are met and continued resident interest is maintained. The findings from this study indicate an opportunity for collaboration and innovation. A combination of facility, family, and resident involvement has the potential to guide what such programming could look like. Future research and engaged planning can be conducted with rural LTC residents and their families to inform PA programming. Solutions to increase resident PA within rural LTC will need to be comprehensive and take into account different perspectives. Additionally, this study only encompasses one state in the Midwest. LTC policies, programs, and funding is determined primarily at the state government level (Coleman et al., 2002), meaning there are likely differences to be explored across states. Thus, additional research

could expand upon these findings by conducting similar studies in rural regions across the U.S. to determine if similar facilitators and barriers emerge.

Conclusions

This study focused on the facilitators and barriers to resident PA within rural LTC from an administrative perspective. Individuals in these positions provide helpful information about organizational structure, policies, environment, and strategies that contribute to resident PA participation in rural LTC. Findings suggest that staffing, space, and funding are among the biggest organizational and environmental barriers to promoting PA in rural LTC. Additionally, lack of resident motivation is a large challenge when trying to get residents to be active. Ideally, sustainable solutions could include addressing the barriers of staffing, space, and funding through policy at the facility, state, or federal level. However, creating and implementing policy is often a complex and lengthy process. Thus, more feasible and more immediate options could be to focus on creating an organizational culture that values PA. PA can be promoted through emphasizing its benefits, ensuring staff communication and collaboration, encouraging staff to motivate residents to participate in PA, and providing staff training on PA. Involving residents and their families in PA decisions, and, perhaps most importantly, making PA fun and enjoyable may be keys to increasing resident PA within rural LTC. These are possible solutions that only begin to address the gap that exists in rural PA LTC literature. More research, greater advocacy, and comprehensive policy are needed to ensure rural LTC is a place that promotes PA, movement, and well-being for all residents.

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Appendix A - Participants and Recruitment

Appendix Table A.1

Code Value	Definition
1	Metro - Counties in metro areas of 1 million population or more
2	Metro - Counties in metro areas of 250,000 to 1 million population
3	Metro - Counties in metro areas of fewer than 250,000 population
4	Nonmetro - Urban population of 20,000 or more, adjacent to a metro area
5	Nonmetro - Urban population of 20,000 or more, not adjacent to a metro area
6	Nonmetro - Urban population of 2,500 to 19,999, adjacent to a metro area
7	Nonmetro - Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Nonmetro - Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Nonmetro - Completely rural or less than 2,500 urban population, not adjacent to a metro area

Sample Phone Greeting – First Round of Calls

Hello, my name is Kendra Marstall. I am a Master of Public Health (MPH) student at Kansas State University, and I am calling to see if your facility administrator or additional administrative staff (e.g., wellness coordinator, activity coordinator, nursing director etc.) would be interested in participating in a research study that aims to better understand the facilitators and barriers to resident physical activity participation in rural long-term care settings. This study includes a short 27-question survey and the opportunity to complete a follow-up individual interview. Upon completion of the survey, you will be entered for a chance to win a $50.00 gift card. Also, the first 10 individuals to participate in the interview will receive a $20.00 gift card. If you, or anyone you know, are interested in the study, would you please provide your contact information (phone and email) for me to send you the informed consent information and the link for the survey?

Thank you so much for your time. I appreciate your interest in the study.

Initial Email Message – For Survey Distribution

Hello, and thank you for your interest in this study, "A Facility Perspective of the Barriers and Facilitators to Resident Physical Activity Participation in Rural Long-term Care Facilities."

I greatly appreciate your time and efforts.

Below I have provided the next steps to this study.

1. This is a 27-question survey and will take approximately 15-20 minutes.
2. As a reminder, all responses are anonymous, so please answer all questions honestly and to the best of your abilities.
3. Upon completion of the survey:
    1. You will be given the opportunity to schedule an optional follow-up interview and/or enter for a chance to win a $50.00 gift card.
    2. Please note that participation in the interview is not mandatory, but it is helpful in understanding the facilitators and barriers to physical activity participation within your facility. The first 10 individuals to sign up for a follow-up interview will be eligible for an additional $20.00 gift card.

Please complete your response in the next 14 days. If you are interested but need additional time or have questions about the study, please reach out to Kendra Marstall at the email below.

-Email: kmarstall1@ksu.edu

Thank you again for your time and interest in this study. It is greatly appreciated.

Follow this link to take the Survey:

${l://SurveyLink?d=Take%20the%20survey}

Or copy and paste the URL below into your internet browser:

${l://SurveyURL}

Follow the link below to opt out of future emails.

${l://OptOutLink?d=Click%20here%20to%20unsubscribe}

Appendix B - Survey

PA in Rural LTC Facilities: A Facility Perspective

Start of Block: Screener

Screener Thank you for your interest in participating in this study. Physical activity and where we do physical activity can change as we age. In this study, we are interested in better understanding the facilitators and barriers to physical activity within rural long-term care settings from a facility perspective. We are also interested in learning more about facility attitudes and environments that influence physical activity promotion.

Please answer the following questions below to determine your eligibility to participate in this study. If you are not eligible for the study, we will not use your responses to this survey in our database. Thank you for your cooperation!

Question 1: Have you worked full-time at your facility for at least four months?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Have you worked full-time at your facility for at least four months? = No

Question 2: Do you hold an administrative position at the facility (e.g., facility administrator, wellness coordinator, activities coordinator, nursing coordinator, etc.)?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Do you hold an administrative position at the facility (e.g., facility administrator, wellness co... = No

End of Block: Screener

Start of Block: Informed Consent

Informed Consent PROJECT TITLE: A Facility Perspective of the Barriers and Facilitators to Resident Physical Activity Participation in Rural Long-term Care Facilities

Thank you for your interest in participating in the following research study. Please read the following informed consent. If you choose to participate, please answer all questions honestly and to the best of your knowledge. Your responses are confidential.

STUDY DESCRIPTION: This research study aims to investigate facilitators and barriers of physical activity in rural long-term care facilities to better understand how to incorporate and promote physical activity within these settings.

STUDY PURPOSE: The goal of this research is to use the information from this survey to contribute to our knowledge of physical facilitators and barriers within rural long-term care settings from a facility perspective. There will be an opportunity to participate in an optional follow-up individual interview that will allow for greater discussion and understanding on the topic.

STUDY PROCEDURE: This study has two parts, a 27-question survey and an optional follow-up individual interview. The survey will last approximately 15-20 minutes, and the individual interview will last around 30-60 minutes. No personal identifying information will be asked of you, and your privacy will be protected. Upon study completion, you will be provided the option to be entered into a drawing for a chance to win a $50.00 gift card (e.g., Amazon).

EXTENT OF RISK AND CONFIDENTIALITY: There is minimal risk involved in this study. Your responses will be kept confidential. Only researchers approved of this protocol will have access to survey and interview data (notes, video, and audio recordings) and all data will be password protected. All survey data is anonymous. Though responses are confidential and deidentified, please note that the information gathered could be used for future research studies or distributed to another investigator for future research studies without additional informed consent.

CONTACT INFORMATION FOR PROBLEM/QUESTIONS:

Kendra Marstall: kmarstall1@ksu.edu

Gina Besenyi: gbesenyi@ksu.edu

IRB CHAIR CONTACT INFORMATION:

Lisa Rubin: rubin@ksu.edu | (785) 532-3224

TERMS OF PARTICIPATION: I understand this project is research and that my participation is entirely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time and stop participating at any time without explanation, penalty, or loss of benefits, to which I may otherwise be entitled. I verify that by clicking "I consent to participate in this study" below, I am indicating that I have read and understand this informed consent form, and that I willingly agree to participate in this study under the terms described.

- ○ I consent to participate in this study (1)
- ○ I do not consent to participate in this study (2)

Skip To: End of Survey If PROJECT TITLE: A Facility Perspective of the Barriers and Facilitators to Resident Physical Activ... = I do not consent to participate in this study

End of Block: Informed Consent

Start of Block: Values and Current PA Levels

Question 1: How important is physical activity (PA) for the following groups at your facility?

	Not at all important (1)	Unimportant (2)	Neutral (3)	Important (4)	Extremely important (5)
Residents (1)	○	○	○	○	○
Facility staff (e.g., nurses, CNAs, therapists, social workers, etc.) (2)	○	○	○	○	○
Facility admin (e.g., facility coordinator, nursing coordinator, activities director, etc.) (3)	○	○	○	○	○

End of Block: Values and Current PA Levels

Start of Block: Physical Activity Rating

Question 2: On average, how would you rate the majority of your residents' current physical activity levels?

- ○ Extremely inactive (someone who is on bedrest) (1)
- ○ Sedentary (someone who gets little or no exercise) (2)
- ○ Moderately active (someone who completes around one hour of exercise daily) (3)
- ○ Vigorously active (someone who completes around two hours of exercise daily) (4)
- ○ Extremely active (someone who completes more than two hours of exercise daily) (5)

End of Block: Physical Activity Rating

Start of Block: Barriers and Facilitators - General

Question 3: We're interested in how your facility supports resident physical activity (PA). How much do you agree with the following statements?

My facility...

	Strongly Disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Provides adequate staff training around PA (e.g., knowledge of PA guidelines, how to incorporate PA, how to lead PA sessions) (1)	○	○	○	○	○
Allocates budget/financial resources towards PA promotion (2)	○	○	○	○	○
Has dedicated staff/volunteers for PA promotion (3)	○	○	○	○	○
Has dedicated infrastructure/space for PA (e.g., fitness facility, walking trail, multi-purpose room, etc.) (4)	○	○	○	○	○
Offers PA equipment (e.g., weights, bands, etc.) (5)	○	○	○	○	○
Provides resident level PA education (e.g., pamphlets, fall prevention, etc.) (6)	○	○	○	○	○

X→

Question 4: We're interested in understanding what facility barriers may prevent resident physical activity (PA) participation.

How much are the following a barrier to resident PA participation at your facility?

	Not a barrier (1)	Somewhat of a barrier (2)	Moderate barrier (3)	Major barrier (4)
Lack of staff knowledge for PA (e.g., how to promote and lead PA) (1)	○	○	○	○
Lack of value for PA at the facility (i.e., other priorities take precedent) (2)	○	○	○	○
Lack of a plan for PA at the facility (e.g., PA is not in the mission statement, not part of care plans, etc.) (3)	○	○	○	○
Lack of support from facility administration for PA (4)	○	○	○	○
Lack of financial funding (5)	○	○	○	○
Lack of time (6)	○	○	○	○
Lack of staff/volunteers (7)	○	○	○	○
Lack of equipment and materials (e.g., weights, bands, etc.) (8)	○	○	○	○
Lack of infrastructure/space for PA (e.g., fitness facility, walking trail, multi-purpose room, etc.) (9)	○	○	○	○

End of Block: Barriers and Facilitators - General

Start of Block: Facilitators - Policy and Programming

Question 5: How does your facility currently promote physical activity for residents? Please check all that apply.

- ☐ Newsletters (1)
- ☐ Resident word-of-mouth (2)
- ☐ Staff word-of-mouth (3)
- ☐ Activities director (4)
- ☐ Activities calendar (5)
- ☐ Other (please type below) (6)

_____

- ☐ None of the above (7)

Question 6: Does your facility currently have policies or protocols promoting resident physical activity participation (e.g., is in the mission statement, a part of care plans, etc.)?

- ○ Yes (1)
- ○ No (0)
- ○ Don't know/unsure (2)

Question 7: Does your facility currently offer physical activity programming for residents?

- ○ Yes (1)
- ○ No (0)
- ○ Don't know/unsure (2)

Skip To: Question 9 If Does your facility currently offer physical activity programming for residents? = No

Question 8: What types of resident physical activity programs are currently offered at your facility? Please check all that apply.

- ☐ Chair exercises (1)
- ☐ Stretching/Yoga (2)
- ☐ Stationary exercising (e.g., treadmill, stationary bike, elliptical, etc.) (3)
- ☐ Walking groups (4)
- ☐ Strength training (5)
- ☐ Aerobic dance/Pilates (6)
- ☐ Water exercises (e.g., water aerobics, swimming, etc.) (7)
- ☐ Other (please type below) (8)

_____

- ☐ None of the above (9)

Question 9: How would you rate the support from the facility administration for offering physical activity programming at your facility?

- Very poor (1)
- Below average (2)
- Average (3)
- Above average (4)
- Excellent (5)

Question 10: Do the current policies and programming help or hinder resident physical activity participation?

- Help (1)
- Hinder (0)

End of Block: Facilitators - Policy and Programming

Start of Block: Facilitators and Barriers – Built Environment and Resources

Question 11: Does your facility offer a designated space (e.g., fitness facility, walking trail, multi-purpose room, etc.) where residents can be physically active?

- Yes (1)
- No (0)

Skip To: Question 13 If Does your facility offer a designated space (e.g., fitness facility, walking trail, multi-purpose... = No

Question 12: What indoor spaces are currently available for physical activity participation? Please check all that apply.

- ☐ Gym/fitness facility (1)
- ☐ Multi-purpose room (e.g., dining room, game room, common room) (2)
- ☐ Indoor walking path (3)
- ☐ Indoor pool (4)
- ☐ Long corridors/hallways (5)
- ☐ Other (please type below) (6)

_____

- ☐ None of the above (7)

Question 13: Does your facility offer opportunities for residents to be physically active outdoors?

- ○ Yes (1)
- ○ No (0)

Skip To: End of Block If Does your facility offer opportunities for residents to be physically active outdoors? = No

Question 14: What outdoor spaces are currently available for physical activity participation? Please check all that apply.

- ☐ Walking paths/trails (1)
- ☐ Patio/courtyard (2)
- ☐ Garden (3)
- ☐ Fishing pond (4)
- ☐ Outdoor pool (5)
- ☐ Sports courts (e.g., basketball, baseball, tennis, pickleball, shuffleboard, etc.) (6)
- ☐ Open greenspace (7)
- ☐ Other (please type below) (8)

_____

- ☐ None of the above (9)

End of Block: Facilitators and Barriers – Built Environment and Resources

Start of Block: Future PA Interests and Needs

Question 15: What additional equipment does your facility offer to promote resident physical activity participation? Please check all that apply.

- ☐ Weights (dumbbells, kettlebells, etc.) (1)
- ☐ Exercise bands and balls (2)
- ☐ Yoga mats (3)
- ☐ Balance boards (8)
- ☐ Stationary equipment (bikes, treadmills, ellipticals, stair steppers, etc.) (4)
- ☐ Other (please type below) (6)

_____

- ☐ None of the above (7)

Question 16: What additional amenities/resources does your facility offer to promote resident physical activity participation? Please check all that apply.

- ☐ Benches (e.g., along long corridors, walking paths) (1)
- ☐ Handrails and/or grab bars (2)
- ☐ Ramps (3)
- ☐ Water fountains (4)
- ☐ Picnic tables (5)
- ☐ Signage (e.g., mile markers along walking paths) (6)
- ☐ Safety pull chains (7)
- ☐ Wide corridors/hallways (8)
- ☐ Automatic doors (9)
- ☐ No-step entries (10)
- ☐ Other (please type below) (11)

_____

- ☐ None of the above (12)

Question 17: How interested would facility admin/staff be in incorporating more physical activity at your facility?

- ○ Not at all interested (1)
- ○ Not very interested (2)
- ○ Neutral (3)
- ○ Somewhat interested (4)
- ○ Very Interested (5)

Question 18: How helpful would the following be in better improving future physical activity (PA) for your residents?

	Not at all helpful (1)	Slightly helpful (2)	Somewhat helpful (3)	Very helpful (4)	Extremely helpful (5)
Increased staff training (e.g., staff education on PA guidelines, how to lead PA sessions, etc.) (1)	○	○	○	○	○
Increased facility funding (2)	○	○	○	○	○
Increased staffing and volunteers (3)	○	○	○	○	○
Administrative support (4)	○	○	○	○	○
Support/interest from residents and resident family members (5)	○	○	○	○	○
Designated space for physical activity (e.g., fitness facility, multi-purpose room) (6)	○	○	○	○	○
Equipment and materials (e.g., weights, bands, stationary bikes) (7)	○	○	○	○	○
Improved physical activity programming (8)	○	○	○	○	○
Increased opportunities for outdoor physical activity (9)	○	○	○	○	○

End of Block: Future PA Interests and Needs

Start of Block: Demographics

Question 19: Please provide the name of your facility in the space below.

_____

Question 20: Which best describes your current role at the facility?

- ○ Facility administrator (1)
- ○ Wellness director/coordinator (2)
- ○ Activities director (3)
- ○ Nursing coordinator (4)
- ○ Other (please type below) (5)

_____

Question 21: How long have you worked at the facility? Please select the most appropriate option.

- ○ 6-11 months (1)
- ○ 1-2 years (2)
- ○ 3-4 years (3)
- ○ 5+ years (4)

Question 22: Please select your facility type:

- ○ Assisted living facility (1)
- ○ Skilled nursing facility (2)
- ○ Both assisted living and skilled nursing facility (3)
- ○ Other (please type below) (4)

_____

Question 23: Is your facility a for-profit or nonprofit facility?

- ○ For-profit (1)
- ○ Nonprofit (2)
- ○ Do not know/unsure (3)
- ○ Other (please type below) (4)

_____

Question 24: Please provide the approximate number of residents you currently have at your facility. Please select the most appropriate option.

- ○ 1-10 (1)
- ○ 11-20 (2)
- ○ 21-30 (3)
- ○ 31-40 (4)
- ○ 41-50 (5)
- ○ 51+ (6)

Question 25: Does your facility accept Medicaid funding?

- ○ Yes (1)
- ○ No (0)
- ○ Do not know/unsure (2)

Skip To: Question 27 If Does your facility accept Medicaid funding? = No

Question 26: If your facility accepts Medicaid, what percentage of residents are on Medicaid?

- ○ 1-25% (1)
- ○ 26-50% (2)
- ○ 51-75% (3)
- ○ 76-100% (4)
- ○ Do not know/unsure (5)

Question 27: Do you have any additional long-term care administrator contacts within your facility that may be interested in completing this survey? If yes, please type their email address below.

_____

End of Block: Demographics

END OF SURVEY:

Thank you for taking the time to fill out this survey!

The purpose of this study is to contribute to our knowledge of physical activity facilitators and barriers within rural long-term care settings from a facility perspective. Your answers are valuable in helping us understand how to better promote and implement physical activity within rural long-term care settings and ensure healthy and active aging for residents. Your time and efforts are greatly appreciated!

If you have any questions, concerns, or would like a final report of the study's findings, please contact the study investigator, Kendra Marstall at kmarstall1@ksu.edu.

If you would like to learn more about the federal physical activity guidelines, please see below for more resources.

U.S. Department of Health and Human Services - Move Your Way
Office of Disease Prevention and Health Promotion - Physical Activity Guidelines for Americans
Centers for Disease Control - Guidelines and Recommendations | Physical Activity

If you are interested in scheduling an interview and/or being entered into a drawing for a chance to win a $50.00 gift card, please click here.

Appendix C - Interview Questions

LTC Administrator Interview

a) Thank you for participating in this interview. Today we would like to ask you several questions about physical activity at your facility, focusing on the barriers and facilitators to participation in physical activity.

b) As the consent form explains, we will record your comments today to ensure we document what you said and get all your words transcribed correctly.

c) All information from this interview is confidential. We will not disclose who participated in this interview; no names will be used in any report. If you have any questions about how the information you provide will be used, you can ask now or contact Kendra Marstall at the email listed on the copy of the consent form provided.

d) Please speak loudly and clearly for recording and transcribing purposes. Also, it is hard to interpret non-verbal responses, so please speak up and share your opinions out loud.

e) As a reminder, this is a safe space, and your thoughts are welcome. There are no right or wrong answers. We are interested in your opinions, your experiences, and perspectives. We want to note that you do not need to share anything you are uncomfortable sharing with us. You are free to skip any questions you are uncomfortable answering. You are also free to bring up any points you think are important concerning what we discuss.

f) Just as a note, we are discussing physical activity today. When we say physical activity, this includes the four domains of physical activity: recreation, transport, household, and occupational.

g) Your responses are valuable, and we thank you again for sharing your thoughts and experiences with us. Are there any questions before we get started?

Interview Questions

Social Norms and Current Physical Activity:

1. Is physical activity mentioned in your facility's mission, vision statement, or philosophy of care? If yes, please tell us about it.
    a. If yes, may we have a copy?
        i. What does your facility do to fulfill this mission statement regarding physical activity?
    b. If no, how would you describe your facility's view of physical activity?
        i. How would you change your facility's mission, vision statement, or philosophy of care to include physical activity?
2. Tell me more about residents' current physical activity participation.
    a. What makes some residents more active than others?
3. How would you describe staff attitudes towards resident physical activity participation?
    a. How do attitudes among staff vary?
4. What about the residents; what are their attitudes towards physical activity participation?
    a. How do attitudes among residents vary?

Facilitators and Barriers to Resident Physical Activity Participation:

5. What are some challenges your facility faces when trying to include physical activity in residents' daily activities?
    a. How do you work around these challenges?
    b. If you had to rank the top three challenges, what would they be?
6. What are some facilitators that aid your facility in promoting physical activity participation for your residents?
    a. If you had to rank the top three facilitators, what would they be?

Physical Activity Policy and Programming:

7. Tell me about your facility's policies or protocols to promote physical activity.
8. Does your facility offer physical activity programming?
    i. If yes, what types of physical activity programming do you offer for residents?
    ii. If no, what types of physical activity programming would you like to offer?

Built Environment and Physical Activity Resources:

9. What types of physical activity spaces are available for residents? Please describe.
    a. What indoor spaces are available for physical activity?
    b. What outdoor spaces are available for physical activity?
    c. Where does physical activity typically take place?
10. What physical activity amenities are available to residents?
    d. Indoor (e.g., weights, resistance bands, stationary equipment, mats, etc.)
    e. Outdoor (e.g., walking paths, benches, gardens, patios, ponds, etc.)