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What community resources do older community-dwelling adults use to manage their osteoarthritis? A formative examination

Kathryn Remmes Martin, PhD, MPH, **Britta Schoster, MPH**, **Janice Woodard, BA**, and **Leigh F. Callahan, PhD**
Thurston Arthritis Research Center, The University of North Carolina at Chapel Hill, 3300 Thurston Bldg, CB#7280, Chapel Hill, NC 27517-7280, Telephone: 919-966-0564

Abstract

Community resources can influence health outcomes, yet little research has examined how older individuals use community resources for osteoarthritis (OA) management. Six focus groups were conducted with 37 community-dwelling older adult African Americans and Caucasians who self-reported OA and resided in Johnston County, North Carolina. Descriptive analyses and qualitative constant comparison methodology revealed individuals use local recreational facilities, senior centers, shopping centers, religious organizations, medical providers, pharmacies and their social network for OA management. Participants also identified environmental characteristics (e.g., sidewalk conditions, curb-cuts, handicapped parking, automatic doors) that both facilitated and hindered use of community resources for OA management. Identified resources and environmental characteristics were organized around Corbin & Strauss framework tasks: medical/behavioral, role, and emotional management. As older Americans live with multiple chronic diseases, better understanding of what community resources are used for disease management may help improve the health of community-dwelling adults, both with and without OA.

Keywords

osteoarthritis; self-management; community resources; built environment; focus groups

There is a substantial likelihood that one will develop some form of arthritis as they advance in age. Prevalence estimates indicate that about 50% of adults over 65 years currently have arthritis and it is estimated that 67 million adults will have arthritis by 2030 (Centers for Disease Control and Prevention (CDC), 2006). As the number of older adults is projected to increase, arthritis will remain one of the most common chronic conditions in older adults. Arthritis is the leading cause of disability in the United States, and is associated with increased activity limitation and lower self-reported quality of life (Abraido-Lanza & Revenson, 2006; Katz & Morris, 2007; Centers for Disease Control and Prevention (CDC), 2006; Centers for Disease Control and Prevention (CDC), 2009).

Osteoarthritis (OA) is the most commonly reported form of arthritis and it most often impacts knee, hip, and/or hand joints. Currently there is no cure for OA and treatment primarily focuses on managing symptoms, particularly pain and stiffness, as well as prevention of further disease progression and associated disability and functional limitations (Altman et al., 2000). While pharmaceutical and surgical interventions are effective for some OA patients, non-pharmaceutical evidence-based strategies such as self-management education, physical activity, injury prevention and weight management are most common

Correspondence to: Leigh F. Callahan.

for reducing the burden of OA (National Center for Chronic Disease Prevention and Health Promotion & Centers for Disease Control and Prevention (CDC), 2010).

Background

Like many other chronic illnesses, OA is a condition that requires medical supervision (i.e., a primary care provider or a rheumatologist) as well as self-management activities to promote positive health outcomes. The concept of self-management can be considered active management of day-to-day activities relating to disease symptom control (e.g., pain management), treatment and medication adherence, negotiating social relationships, and adaptation to lifestyle and role changes (Lorig & Holman, 2003; Coleman & Newton, 2005; Barlow et al., 2010; Clark et al., 1991; Lorig et al., 1984). Emerging from global models of interpersonal health behavior (e.g., concept of self-efficacy and Social Cognitive Theory) is a literature focused on chronic disease self-management and self-regulation that recognizes that disease management is a complex interplay between the individual, family, community and environment (Clark et al., 2001; Grey et al., 2009). Furthermore, Corbin and Strauss identified three broad tasks that form an underlying structure of chronic disease management: medical and behavioral management, role management, and emotional management. Individuals actively manage medical aspects of their disease and engage in health promoting behaviors (i.e., medical and behavioral management task), maintain life roles (i.e., role management task), and deal with emotional experiences of living with a chronic disease (i.e., emotional management task) (Corbin & Strauss, 1988; Lorig & Holman, 2003; Coleman & Newton, 2005). Examples of strategies used as part of arthritis self-management and/or symptom control that fit within these three broad self-management tasks include activities such as seeking education and information, following a medication, nutrition, or physical activity regime, reducing or modifying activities to maintain independence, and/or relying upon social networks (MacKay et al., 2007; Keysor et al., 2003).

Older individuals with chronic conditions, such as OA, can greatly benefit from support in carrying out self management tasks (Coleman & Newton, 2005), and support can come from a wide range of external factors or resources. Glasgow, Strycker, Toobert and Eakin conceptualized and developed a chronic disease self-management pyramid of social-environmental support based on the social-ecological framework (Glasgow et al., 2000). They suggest that support can be both informal and formal, and influences the individual from various levels: personal relationships (e.g., family and friends, as well as health care providers), context (work, organization, neighborhood environment), and culture (media, policy, community/region). The model of social-environmental support extends beyond the individual to suggest that “more distal sources of support (and barriers), including workplace, media, public policy and other neighborhood and community factors” are important for chronic disease self-management (Glasgow et al., 2000), as well.

There exists an extensive literature examining the influence of community and neighborhood environment on health outcomes (e.g., all-cause and disease-specific morbidity and mortality, psychological health) and health behaviors (e.g., physical activity, smoking, eating habits) in the general population (Diez-Roux et al., 2001; Yen & Kaplan, 1999; Marmot & Wilkinson, 1999; Kawachi & Berkman, 2003), as well as among older adults (Yen et al., 2009). Research seeking to further understand this relationship suggests that at the community level, community resources such as medical care, hospital facilities, places to be physically active, available and accessible shopping, as well as social connections through family, friends, neighbors, senior centers, and religious organizations may influence older adults’ health (Feldman & Oberlink, 2003; Weierbach & Glick, 2009; Booth et al., 2000; Li et al., 2005). More specifically, community services such as

transportation, meal-delivery, household chore assistance and living in a safe physical environment may help promote disease self-management, physical activity, as well as independent living and successful aging (Feldman & Oberlink, 2003; Weierbach & Glick, 2009; Booth et al., 2000; Li et al., 2005). Among older adults, it has been demonstrated, that higher perceived quality of area facilities, neighborliness (Bowling et al., 2006), and physical environment (Wen et al., 2006) promote better self-rated health, while lower perceived neighborhood safety tends to be associated with mobility disability among lower-income, retirement age adults. Among individuals with arthritis, worse perceived neighborhood environment, in terms of aesthetics, safety and social cohesion, is associated with greater disability and poorer mental health outcomes (Martin et al., 2010).

Yet, while research has linked important community characteristics to health outcomes for older adults with and without arthritis, little research has examined what, if any, community resources are used for OA self-management. Only one qualitative study was identified that linked community resources to OA management. The study included 19 older adults with arthritis in Ontario Canada, found that exercise programs (land and water), organizations for equipment and assistive devices, and support groups were used for arthritis management (MacKay et al., 2006). Finally, prior qualitative research has found that a major barrier to self-management is that older adults, particularly rural adults, cannot identify resources that would be helpful for disease self-management and they lack knowledge of resources available in their community (Weierbach & Glick, 2009; Li, 2006; Gallagher & Truglio-Londrigan, 2004; Schulenburg & Coward, 2008).

While previously identified community factors may be relevant to OA self-management (e.g., medical care, social support), this study aimed to uncover community resources specifically used by older adults with OA and to better understand their lived experience of using community resources for OA self-management. This qualitative study was designed as formative research for a future quantitative study examining potential mediators in the relationship between socioeconomic status and arthritis outcomes such as OA severity and functional disability. This paper reports on participant-identified community resources, as well as the salient community environmental characteristics identified as facilitators and barriers to use of community resources in OA self-management.

Method

Geographic Context

We offer a brief contextual description of Johnston County because identification of community resources and characteristics by participants who are community-dwelling older adults with OA may reflect the historical and current economic, social and geographic landscapes. Johnston County has historically been, and remains, a largely rural, agricultural county. Between 2000 and 2008, Johnston County saw a 34% population growth and in 2008 the county population density was 154 persons per square mile (U.S. Census Bureau, 2008). Of the Johnston County residents, 63% are aged 18–64, and 9.1% are 65 years old and over (U.S. Census Bureau, 2008).

Recruitment and Participants

This current research study draws upon an existing study, the Johnston County Osteoarthritis Project (Hartman et al., 2007). This project is housed out of Smithfield, NC (the county seat) and over 4000 individuals have been enrolled and followed since the early 1990s. During the summer of 2008, Johnston County OA Project staff recruited community members with OA for focus group discussions; sampling was largely convenience and most participants were also part of the Johnston County OA project. Eligibility criteria were only that the

participant live within Johnston County, have some form of OA (knee, hip, or combination), and be at least 18 years of age. Focus groups were held at the Rural Health Research Clinic in Smithfield, Johnston County, NC. Study objectives and focus group procedures were given both orally and written, and written consent was obtained from all participants. All research methods were approved by the University of North Carolina Institutional Review Board. Participants were offered refreshments of food and drink during the focus groups and given $20 as a thank-you for their time and participation.

A total of 37 adults, 18 African Americans (17 women, 1 man) and 19 Caucasians (14 women, 5 men) participated in the focus group discussions. The mean age of participants was 71 years (range: 50–90) and 24 (68%) reported a high school education or greater. The majority of participants reported a marital status of widowed (54%) or currently married (24.3%). Twenty-two (59.4%) participants self-reported their general health status as ‘excellent’, ‘very good’, or ‘good’, 12 participants (32.5%) reported ‘fair’ and 3 (8.1%) reported ‘poor’ general health. Self-report arthritis severity was also assessed; 13 participants (35.2%) reporting mild arthritis, 15 (40.5%) reported moderate and 9 (24.3%) reported severe arthritis. Income was not queried for this group, as previous work with members of the Johnston County community indicated that participants do not readily give out income and salary information due to its sensitive nature.

Procedures

Focus Group Description—The use of a qualitative technique, such as focus group discussions, is ideal because it affords researchers the opportunity to directly engage participants in conversation about their personal experience. Six focus groups were conducted with 4–8 community-dwelling adults with self-reported OA. Groups were stratified by race (African American/Caucasian) and geography (urban/rural) to encourage group cohesion and more in-depth discussion. Participants were purposefully recruited from more ‘urban’ sections of Johnston County (population-dense Smithfield, Selma and Clayton), as well as more ‘rural’ areas (population-sparse Micro, Princeton, and Kenly) in order to ensure representation from the varied geographic county areas. Two facilitators co-led each group; one facilitator (JW) was also a resident of Johnston County.

Focus Group Questions—Participants were led by the facilitators in discussions that broadly asked, “What resources, if any, in your community help you to manage your arthritis?” and “What resources, if any, do you believe would help you to manage your arthritis that are not available in your community?” Resources were discussed as relating to the social and physical environment (people, places and organizations), with additional questions asked to probe for further detail. Transcripts were audio-recorded and transcribed verbatim.

Analysis—We used the Corbin and Strauss framework to guide the analysis of the focus group transcripts in identifying community resources or services that participants use for OA self-management tasks. Transcripts were reviewed and analyzed using the constant comparison method to identify 1) emergent community resources that related to the three self-management tasks: medical and behavioral management, role management, and emotional management and 2) environmental facilitators or barriers to use of community resources for OA management. The constant comparison method aims to compare and contrast, as well as identify conceptual similarities and patterns within the data (Boeije, 2002; Krueger, 1994; Corbin & Strauss, 2008; Dye et al., 2000). We approached the analyses with pre-determined coding schema based on focus-group questions and self-management task definitions. We explored whether the identified community resources varied within and across focus groups, as well as across race. Our analysis considered

frequency, extensiveness and intensity of comments when determining emerging themes and we use number adjectives (e.g., a few, many) in reporting our results to indicate magnitude (Krueger, 1998). Two members of the research team (KRM, BS) independently reviewed the transcripts for emergent themes and then met to discuss the themes to ensure consistent use of their pre-established definitions, and that thematic saturation had been reached for each of these primary domains. Any points of contention were discussed with a third member of the team (LFC).

Results

The community resources identified by the participants are organized around the three self-management tasks and explained in the context of the service that the community resource provides to the participant. When describing the community resources they used to manage their OA, participants also discussed characteristics of the community environment that both facilitated and hindered their OA management. Analyses revealed that these emergent themes did not differ by race. Themes and sub-themes are listed in Table 1.

Community Resources

Medical and Behavioral Management—A few participants identified health care providers, such as family doctors and physical therapists, as community resources that provide medical directives, services and information useful for medical management of their OA. One participant stated:

> I get information from my doctor in Benson…I have information to show me how to exercise my shoulders - I have trouble with my shoulders and also my knees.

In addition, participants frequently spoke about the importance of engaging in healthful behaviors for OA management, such as being physically active (a form of *behavioral management*). They identified local area senior and civic centers, a local health facility and aquatics center, as well as community parks and religious organizations as community resources providing indoor and outdoor spaces for physical activity. Participants stated:

> I go to the senior center at least twice a week. We do exercises. We have a real nice exercise room, with treadmills, bicycles, weights, and all those things.

> I go to Church in Selma, and they are building some walking trails at the church for everybody to come and they are also having two soccer fields built so that is going to be free for the community to come and use.

Role Management—Participants identified community resources they used to manage their OA. Role management, one self-management task, allows the individual to maintain independence by modifying or adopting new behaviors, as well as accepting help from others in order to engage in meaningful life activities. These resources included religious organizations, shopping centers, transportation options (both private and public), and social support networks (e.g., family, friends and neighbors).

Religious organizations, transportation and social support networks were noted by a few participants as community resources that they used to manage their OA and keep independent despite mobility limitations:

> As soon as I get my scooter, I'm working on getting my scooter now… [my church] is going to build me a ramp, so I can get out of the house. Then I'll be driving to church, not riding.

> There is JCATS [Johnston County Area Transportation Service]…. You have to notify them a week in advance or whatever before your appointment…

> This lady from the church picks me up every Sunday morning and brings me home at night. I have a lot of friends helping out.

Several participants told us how they used their social support network for self-management and to continue completing day-to- day tasks, despite difficulties caused by OA:

> Sometimes they go and pick up groceries for me, they take me places sometimes, and I don't have to drive myself if I don't feel like I'm able to drive. They go and do little things for me, from time to time.

> I have a neighbor that cuts my grass and he does a lot of little things for me that I can't do, like climbing or [reaching for] things up high.

> I do have bad back problems and I can't bend sometimes. So my husband helps getting clothes out of the dryer and hanging clothes out.

> I am self employed and most people I work for try to buy things that are good for my hands like [a particular] vacuum cleaner for my arthritis. The lady that I work for provides for me pretty well.

Participants also identified additional community resources, such as an independent pharmacy and local food bank, which were both discussed in relation to helping with OA management by offering 'home-delivery' service. One participant stated:

> I need help and also I buy medication from the Pharmacy. If I get where I can't go get it, they'll deliver it for me.

Emotional Management—The majority of participants listed family, friends and neighbors as community resources and discussed the influence these individuals had on managing the emotional aspects of living with OA. They cited the positive benefits that talking and socializing with neighbors, friends and family had on their arthritis symptoms:

> Once you get out there with someone, you know that it [arthritis] is still there, but it would change. It would kind of fade away from your mind 'cause you get with a group and you get to talking. It is still there, but it kind of lifts the burden a little.

A few participants commented about the caring and watchful nature of neighbors, suggesting that participants take emotional comfort in feeling looked-after, which in a sense, helps to emotionally manage their OA. One participant told us:

> When you come home at night, I'm always up, I always watch out for you, to make sure if you was to fall down in that yard, that I could get some help out there or try to help you get up.

In addition, a few participants discussed feelings of perceived community and neighborhood safety in relation to their concerns over mobility limitations:

> If I was out on my porch and or in my yard and someone approached me, with my leg and my knees and all the way they are, I wouldn't be able to get back in my house as quick as I would if I didn't have arthritis.

Community Environmental Barriers and Facilitators to OA Management

In all focus groups discussions, participants identified community environment characteristics that both facilitated and hindered their use of community resources for OA management in terms of medical and behavioral management, as well as role management

(see Table 2). Participants did not, however, community environment characteristics in terms of emotional management.

Medical and Behavioral Management—The majority of participants discussed lighting, sidewalks (availability, quality) and level surfaces as key community environment characteristics that they believed were important to walking for physical activity, one way to behaviorally manage their OA:

> It is hard to walk in downtown Smithfield because the sidewalks are so cracked and holey; you have to walk very carefully. It's harder if you have arthritis when you don't have a smooth place to walk.

> What I would like to see in the neighborhood that I live in, we are short of sidewalks and therefore you have to walk over the highway and that's not [safe]. Another thing is that this area is unlighted, it's not lighted sufficiently, so you have to make sure you walk in the daytime when you can see good.

> I have noticed this in walking in the neighborhood in Selma, sometimes you have to get more to the center of the street because if you are on the edge, it is like it is slanted, it's not, you know, sometimes a little bit aggravating after a while. I have to get up in the middle of the road because it will make my hip hurt.

Several participants told us that short distances between their place of residence and community resources such as shopping and recreational facilities promoted physical activity:

> Well, in my community we walk to Walmart, walk to Food Lion, we have walked as far as the Dollar Tree store, and most of the people who live out in my community walk to Walmart because it's right across the field. I'm very fortunate that way.

Another participant, living in a more 'rural' area of the county, stated:

> I have an acre field right there behind my house, I get out and walk around it whenever I like, whenever I can walk.

Conversely, participants discussed distance to recreation centers as a barrier to physical activity. Several participants told us that while there were available recreational areas to use, they were located too far from their homes or neighborhoods to be convenient, making it more difficult to be physically active. Participants expressed desire for small community-based centers or recreational facilities that offered physical activity programs (e.g., aquatics programming), walking areas, and exercise equipment, preferably in closer proximity to their homes and neighborhoods:

> I would like to see another community center on that side of town…They have one on Barnhill Road in Clayton. But I would like to see another, maybe small one on the other side, so you wouldn't have to go so far due to the price of gas.

Across focus groups, many participants told us about the fees associated with certain physical activity opportunities, particularly aquatic exercises, which were perceived as cost prohibitive:

> Yeah because you know your, as you get into retirement age you don't have the resources. I go to water aerobics in Wilson. You know, I buy gas and drive my car to Wilson for an hour and come back, you get to a point, well I don't know that I got that much out of it, you know. But if it was free and so forth it, maybe I would go more.

> My doctor talked to me about taking water aerobics at the medical mall, he told me that it would help my arthritis in my legs and back. [Have you done it?] No ma'am, because insurance don't pay for all of it. Financially, I cannot afford it.

Role Management—Participants also discussed inconsistent access to ramps and curb cuts as important community environment characteristics that, when present, help to increase mobility and accessibility of community resources used for OA management.

> Our church built a new ramp outside, for anybody that has a problem so that they can get in, and that has really come in good.

> Not at my church. It is not designed [for] handicapped people at all. It is bad to get in and out of, you got to put in a lift that works part the time, the church is not designed for ramps and so forth, the church floor [is] too high.

Many participants discussed accessibility of commonly visited areas like shopping centers, grocery stores and churches, citing lack of adequate accessible parking, as well as the availability and location of handicapped parking spaces in general:

> I would like to see, more available parking closer. I saw one town where they had parking down the middle of the street, so that people…could park in the middle of the street and be more connected to the stores. In downtown Clayton, they just have one line of parallel parking. If you want to get near a store, and you are sore that day, it is hard…

> I can't understand why some businesses have handicap parking, but it's away from the building. And those close to the building are not handicapped.

Access in and out of buildings was also discussed, with emphasis on door-type as an important community environment feature. Buildings with heavy, manual doors presented the most difficulties and most participants were in agreement over the benefits of automatic doors as a community environment characteristic that was used for managing OA symptoms (e.g., hand soreness and pain):

> That door [at church] is so strong that I have to take both hands and try and open the door.

> Most of the stores have automatic doors, [but] the ones who don't; it would be helpful if they did. Because when your hands are sore, you can't open the doors very well.

> I like going in [the grocery store] and that is where the doors open by themselves, you don't have to push. And it is pretty convenient for me.

Discussion

In this study, we set out to identify community resources that older adults with OA report using in their daily self-management of OA. Using qualitative methodology, we found that participants easily identified community resources while also giving the context in which environmental characteristics made it easier or harder to engage in self-management activities throughout the community.

Our findings reveal that participants relied upon religious organizations, medical providers, and social networks for medical care and medical information, and this supported their ability to medically manage their OA. They listed community aquatics centers, senior centers, shopping centers and recreational facilities as resources they used for physical activity and walking - a commonly recommended form of exercise for behaviorally

managing OA. In addition, participants discussed using services offered by local pharmacies, shopping centers, and religious organizations, as well as depending on their social network (e.g., family, friends and neighbors) for services such as transportation and assistance with housework. These community resources appear to allow these participants to reduce, modify or adapt the way they conduct everyday activities so as to maintain independence despite OA symptoms and pain. Finally, the social network emerged as an important resource that assisted in the emotional management of OA. Participants discussed the positive benefits of conversation and receiving emotional support from their social network.

A contextual description of the community environment, as relating to the community resources used for OA management, also emerged from the focus group discussions. Participants cited sidewalks, walking surfaces, and lighting as built environment features that acted as facilitators and/or barriers to activities conducted in the community. They also discussed proximity to community resources, especially recreational facilities and costs associated with community programs as barriers and/or facilitators to resources typically necessary for medical or behavioral OA management. Finally, participants highlighted the function of built environment features such as lack of handicap parking, access ramps, curb cuts, and automatic doors as barriers to maintaining independence, accessing identified community resources, and engaging in activities necessary for role management.

Many of the resources identified in this study (e.g., recreational facilities, social network members) are similar to resources that older individuals have previously identified as important for maintaining health (Feldman & Oberlink, 2003; Weierbach & Glick, 2009). Our findings are also consistent with past research suggesting that community-built environment factors (e.g., access to facilities, availability of options, cost, sidewalk condition/availability) play a role in physical activity levels in older adults, either with and without arthritis (Humpel et al., 2002; Martin et al., 2007; Shih et al., 2006; Wilcox et al., 2006). In addition, recent research examining the association between specific built environment features (e.g., sidewalks, parks, curbs with curb cuts) and disability, indicates that neighborhood proximity to parks, adequate handicap parking and presence of public transportation are supportive of older adults' continued social, leisure and work role activities (White et al., 2010).

Previous studies examining transportation access and availability (both perceived and actual) in elderly populations suggest that transportation (public and private) is an integral component in maintaining social relationships, personal independence, participation in activities, physical functioning, and chronic disease management efforts as it facilitates easier access to services and medical resources, especially in rural communities (Balfour & Kaplan, 2002; Johnson, 2002; La Gory & Fitpatrick, 1992; Rosenbloom, 1993; Goins et al., 2006; Wilkie et al., 2007; Keysor et al., 2010). Our findings also indicate that transportation is important and necessary for older adults' continued engagement in self-management tasks. Private or personal transportation was cited more often as a community resource than was public transportation. Many participants discussed being self-reliant (e.g., driving themselves) or relying upon social network (e.g., being driven by family or friends). We hypothesize that older residents may be more familiar and comfortable with private transportation because Johnston County has historically been without a comprehensive public transportation system. Alternatively, participants may be unaware of the availability or eligibility guidelines of county-wide paratransit services.

In addition, our findings suggest that social support networks may have a beneficial effect on physical and mental health outcomes by supporting the individual with OA in all three forms of self-management tasks: medical/behavioral, role, and emotional. The importance of

social support on older adults and in chronic disease management (particularly arthritis), is well documented in the literature. Social support can be complex in its effect on the physical health and psychological well-being of the recipient, as giving and receiving social support, either actual or received, has been shown to yield both beneficial and harmful outcomes (Affleck et al., 2005; Lanza & Revenson, 1993). Previous research indicates that older adults with arthritis are in receipt of greater instrumental support from their social support network than older adults with other chronic diseases (Penninx et al., 1999). It also indicates that relatives, friends and neighbors form the social environment that can provide direct support, as well as act as a resource to reduce stress and depressive symptoms (La Gory & Fitpatrick, 1992) and improve health-related quality of life in older adults with OA (Ethgen et al., 2004).

Our findings extend existing literature by suggesting that building structures and amenities found at frequently visited community locations (e.g., churches, grocery stores, recreational facilities) can easily act as either a facilitator or a barrier to an individual's ability to use community resources when engaging in OA self-management tasks, particularly in the context of medical/behavioral and role self-management tasks. In order to make accommodations for these physical OA symptoms, participants told us they make use of ramps, curb-cuts and handicap parking. Participants also reported choosing to visit shops with automatic doors and frequenting community areas with accessible and available handicap parking so as to avoid hand, knee or hip pain associated with OA. While community resources that offer services, like home delivery, can help an older adult avoid navigation of inaccessible community locations by bringing needed goods and services directly to the individual, it is important to consider ways in which to increase community accessibility for all individuals.

Many of the environmental barriers that participants in this study identified as influencing the accessibility of resources located in the community (e.g., ramps, curb-cuts, ground/floor surfaces, handicap parking, and manual doors) are, in theory, guided by the Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities (ADAAG) (United States Access Board, 2010). These guidelines serve as the minimum basis for ADA standards aimed at reducing discrimination and inaccessibility of public areas for individuals with disabilities. These guidelines and standards are relevant to older adults (especially those with OA) as they might have difficulty navigating the community environment due to functional limitations or pain caused by chronic conditions. Physical environment barriers might keep older adults from accessing community resources for good health management. We hypothesize that many community-areas described by participants as inaccessible may be in areas of Johnston County that are either more rural or of older construction age and would benefit from site improvements that take ADAAG guidelines into consideration. Modifications to the physical environment may help to buffer mobility impairments and disability in older adults due to chronic illness, as well as promote sustained engagement in life-activities that take place in a community setting.

Finally, previous research examining the role of environment and neighborhood characteristics on older adults' quality of life, health, disability, and physical functioning, has found that living in a worse environment typically results in worse health outcomes (Balfour & Kaplan, 2002; La Gory & Fitpatrick, 1992; Wilkie et al., 2007; Keysor et al., 2010). Clarke and George's research examining the role of the built environment in the Disablement Process suggests that "structural barriers operate as 'exacerbators' that increase the gap between an individual's functional capacity and their ability to carry out desired activities, calling attention to the importance of the 'person-environment fit'" (Lawton, 1983; Clarke & George, 2005). Findings from our study support this conclusion, as well as encourage us to consider that the availability and accessibility of community resources for

older adults is supportive of positive chronic disease self-management activities (medical/behavioral, role, and emotional management tasks). These activities may in turn play a role in reducing or preventing further functional decline and disability in older adults with chronic conditions like OA.

This formative, qualitative study has several strengths. First, the nature of a qualitative research approach allowed us to probe and understand the context of how individuals with arthritis use community resources to manage their OA in more depth than would a telephone or mailed survey. In addition, by recruiting community-dwelling individuals from several areas of Johnston County, including areas considered rural and urban/suburban by North Carolina standards, we heard about participants' varied experiences in these different areas. It should be noted that this study is limited by its inability to scientifically generalize findings to other populations due to convenience sampling techniques, eligibility criteria, and the average age (71 years) of the participants. While our sample size was small (N=37), previous research has indicated this number is sufficient for this type of formative examination (Griffin & Hauser, 1993; DePaulo, 2000). Finally, we acknowledge that our findings might be subject to social desirability bias. Participants might be more likely to identify and discuss community resources related to OA management they believe are appropriate (e.g., physical activity recreational facilities) rather than resources used, but considered socially inappropriate (e.g., local bar).

Future research might expand upon this study by examining how older adults, particularly those with OA, engage in daily activities or make accommodations given their OA management strategies. More specifically, research might consider OA management strategies in terms of continued participation in valued life activities such as appointments, shopping, hobbies, and social activities (e.g., visiting) that more often take place in out-of-home environments. Because there are differences in how individuals with and without mobility limitations experience the community environment, more research should be conducted with participants ranging from having 'no limitations' to 'severe limitations'. Finally, future research might consider built-environment interventions at the community-level to improve accessibility of community spaces for older adults with functional limitations, particularly in areas with community amenities and facilities of older age.

In summary, as the aging baby-boomer generation 'grays' America, the number of older Americans living with multiple chronic diseases and disease-related activity limitation is projected to increase, as are associated levels of disability (National Center for Chronic Disease Prevention and Health Promotion, 2009). Application of the Corbin and Strauss self-management tasks to organize the community resources identified by our focus group participants allowed for a richer contextual understanding of which community resources older adults with arthritis use to engage in tasks related to OA self-management (e.g., manage pain and functional limitations). This knowledge can assist health care providers in identifying gaps in resource and service provision, as well as discussing and developing OA management plans with their patients. This study also adds support for multi-level, context appropriate interventions to better the use of community resources to improve the health of older community-dwelling adults, regardless of OA status. Finally, city and regional planners might work with local businesses and builders to incorporate senior-friendly design into new construction or in public and private community spaces renovations to increase accessibility for all residents, especially older adults. Findings from this formative study both support and illustrate that community resources and the community environment are important factors in daily OA management.

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Table 1

Primary Community Resources and Related Community Service by Self-Management Task

COMMUNITY RESOURCE	COMMUNITY SERVICE PROVIDED BY RESOURCE
Medical and Behavioral Management	
Community Aquatics Center	Physical activity (e.g., swimming, aquatics class)
Senior Center; Council on Aging; Civic Center; Medical Mall	Physical activity (e.g., indoor exercise classes & equipment)
Shopping Center	Physical activity (e.g., walking)
Community Recreational Facilities (e.g., walking trails)	Physical activity (e.g., outdoor activities)
Religious Organization (e.g., walking trails, health talks)	Physical activity and health information
Medical Providers (e.g., family doctor, home health aide)	Medical care and source of medical information
Social Network (e.g., family, friends, neighbors)	Assistance obtaining goods; transportation to medical services and providers
Role Management	
Social Network (e.g., family, friends, neighbors)	Help with yard work, household chores and provide transportation
Community Transportation (e.g., JCATS, Williams Transport)	Transportation to shopping, medical appointments
Pharmacy	Home Delivery Service
Rescue Mission; Meals on Wheels	Home Delivery Service
Library	Home Delivery Service
Shopping Areas (e.g., grocery stores)	Shopping carts used as assistive devices
Religious Organization	Tangible assistance building ramps; improving access to building
Emotional Management	
Social Network (e.g., family, friends, neighbors)	Care and support, as well as socializing to ‘take mind off pain’

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Table 2

Community Environment Characteristics and Related Barriers and Facilitators Important for OA Management *

COMMUNITY ENVIRONMENT CHARACTERISTIC	BARRIER OR FACILITATOR TO ACCESSING COMMUNITY RESOURCE
Medical and Behavioral Management	
• Sidewalks	Barrier: Not available. Facilitator: Available
• Walking Surfaces	Barrier: Uneven or unlevel; defects such as cracks or holes
• Lighting	Barrier: Location; insufficient amount of light
• Proximity	Barrier: Far from resources. Facilitator: Close to resources
• Cost	Barrier: Fees for services too high. Facilitator: Free services
Role Management	
• Access Ramps	Barrier: Not available; bad location. Facilitator: Available; accessible
• Handicap Parking	Barrier: Not enough available spaces; not located close to entrances; inaccessible
• Curb Cuts	Barrier: Not available (curb too high). Facilitator. Available
• Doors	Barrier: Heaviness of manual doors. Facilitator: Automatic doors

* Here, the organization of community environment characteristics under each management task is specific to emergent themes from the focus group participants in this study. Future research may find that these categories are not mutually exclusive.

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