Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Assessing the built environment, programs, and policies that support physical activity opportunities in the rural Deep South

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ARTICLE INFO

ABSTRACT

Disparities in physical activity (PA) exist in rural regions and prior research suggests environmental features and community resources likely contribute. It is important to identify the opportunities and barriers that influence activity to appropriately inform PA interventions in such areas. Thus, we assessed the built environment, programs and policies related to PA opportunity in six rural Alabama counties that were purposively selected to inform a PA randomized controlled trial. Assessments were conducted August 2020-May 2021 using the Rural Active Living Assessment. Town characteristics and recreational amenities were captured using the Town Wide Assessment (TWA). PA programs and policies were examined with the Program and Policy Assessment. Walkability was evaluated using the Street Segment Assessment (SSA). Using the scoring system (0–100), the overall TWA score was 49.67 (range: 22–73), indicating few schools within walking distance (≤5 miles of the town's center) and town-wide amenities (e.g., trails, water/recreational activities) for PA. The Program and Policy Assessment showed a paucity of programming and guidelines to support activity (overall average score of 24.67, [range: 22–73]). Only one county had a policy requiring walkways/bikeways in new public infrastructure projects. During assessment of 96 street segments, few pedestrian-friendly safety features [sidewalks (32%), crosswalks (19%), crossing signals (2%), and public lighting (21%)] were observed. Limited opportunities for PA (parks and playgrounds) were identified. Barriers such as few policies and safety features (crossing signals, speed bumps) were indicated as factors that should be addressed when developing PA interventions and informing future policy efforts.

1. Introduction

The prevalence of physical activity (PA) in the Deep South, or southeastern region (Merriam-Webster Dictionary), remains the lowest in the US. Within this area, specifically Alabama, Georgia, South Carolina, Louisiana, and Mississippi, only 30% of adults (Centers for Disease Control and Prevention (CDC), 2022a) and 22% of children (ages 6–17) (United Health Foundation, 2022b) are physically active, or engage in the recommended amount of regular PA (≥150 min of moderate-intensity aerobic activity; ≥60 min of moderate-to-vigorous intensity activity per day, respectively) (Centers for Disease Control and

Prevention CDC, 2022d; Centers for Disease. Control and Prevention CDC, 2022c). In rural or sparsely populated (<2,500 residents), open countryside areas (United States Department of Agriculture (USDA), 2022), the levels of PA are even lower (Whitfield et al., 2019). Consequently, the incidence of related chronic disease (e.g., heart disease, stroke, cancer, and Type 2 diabetes), and related mortality is disproportionately higher in comparison to urban areas (Dugani et al., 2021; Rural Health Information Hub, 2022). It is evident that PA interventions in rural areas are necessary to decrease the burden of preventable chronic diseases and improve associated longevity and quality of life. Existing literature indicates disparities in PA across geographical regions

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with environmental characteristics and community resources playing important roles (Jones et al., 2021; Carter et al., 2019).

The environment, programs, and policies impact opportunities for PA engagement, particularly in rural settings. Residents in rural areas are more likely to be physically inactive due in part to barriers (e.g., walkability, lack of recreational facilities, lack of transportation) that are not as prevalent in other areas (Park et al., 2017). Challenges related to built environment factors have been evaluated using the Rural Active Living Assessment (RALA) in North Carolina (Hege et al., 2017), Alabama (Robinson et al., 2014), Mississippi (Robinson et al., 2014; Thomson et al., 2019), Washington (Perry et al., 2015), Hawaii (Hafoka, 2017), and Illinois (Dalstrom et al., 2021). Findings from these studies (Hege et al., 2017; Robinson et al., 2014; Thomson et al., 2019; Perry et al., 2015; Hafoka, 2017; Dalstrom et al., 2021) have revealed environmental barriers (e.g., walkability, lack of safety features), and gaps in town programs (e.g., no existing "Walk to School" programs) and existing policies (e.g., requiring pedestrian walkways/bikeways in new infrastructure projects) that all contribute to low levels of PA (Hafoka, 2017). Despite the previous assessments, there are still persistent issues with physical inactivity, particularly in Alabama (United Health Foundation, 2022b; United Health Foundation, 2022a). Built environment barriers likely remain, as the RALA data was last collected in Alabama over 10 years ago in four rural counties (Sumter, Perry, Bullock, and Wilcox) (Robinson et al., 2014).

To address the low levels of PA and related barriers that contribute to the existing cancer disparities (e.g., finances, culture, literacy, transportation, geographic isolation) (Pekmezi et al., 2013) in rural Alabama counties, a multi-level, telephone-based, randomized controlled trial PA intervention, Deep South IVR-Supported Active Lifestyle (DIAL), was developed and is ongoing in six rural counties (Sumter, Dallas, Choctaw, Marengo, Greene, and Hale) (Brown et al., 2021). Prior to developing and implementing community/organization-level intervention strategies (e.g., promoting PA via monthly newsletters by highlighting amenities such as local parks, walking trails, recreational facilities) for this ongoing PA intervention, more research regarding existing opportunities for PA is warranted. Further, previous formative research conducted among rural-dwelling women revealed lack of access to safe and affordable resources within their community as a barrier to PA (Pekmezi et al., 2013). Addressing such environmental-level concerns could require policy-level approaches. Therefore, environmental assessment of the six rural regions where the ongoing physical intervention is being conducted is needed to inform future policy efforts. Thus, the current study seeks to assess and describe physical environment and existing community programs and policies that support PA in these six rural Alabama counties and thereby inform the development of our ongoing multi-level PA intervention, DIAL, and future policy efforts for underactive adults residing in this region (Brown et al., 2021).

2. Methods

2.1. Research setting/design

A cross-sectional design was used to evaluate PA built environment, town characteristics, recreational amenities, and community programs and policies (based on RALA data) in six rural counties (Sumter, Dallas, Choctaw, Marengo, Greene, and Hale) within the Alabama Black Belt in which underactive residents are participating in a larger ongoing PA randomized controlled trial, DIAL (Brown et al., 2021) (NCT03903874). This geographical region characterized for its predominate population of non-Hispanic Blacks and prevalence of high poverty rates, low household income, low educational attainment and high incidence of chronic diseases (Lian et al., 2015; Merriam-Webster). This study was approved by the University of Alabama at Birmingham (UAB) Institutional Review Board. Data collection occurred August 2020-May 2021.

2.2. Instrument and procedures

The RALA is a comprehensive assessment composed of three separate assessment components: the Town Wide Assessment (TWA), the Program and Policy Assessment (PPA), and the Street Segment Assessment (SSA) (Yousefian et al., 2010). This instrument has been used in many past studies (Hege et al., 2017; Robinson et al., 2014; Thomson et al., 2019; Perry et al., 2015; Hafoka, 2017; Dalstrom et al., 2021) with the SSA component demonstrating very good inter-rater reliability (κ statistic = 0.78) (Yousefian et al., 2010). Validity has not been assessed (Yousefian et al., 2010).

Prior to beginning these assessments, raters (i.e., a trained research staff member and local rural county coordinators from the UAB O'Neal Comprehensive Cancer Center's Office of Community Outreach and Engagement) attended a virtual training session via Zoom on assessing the environmental/neighborhood features and how to properly use the provided *Rural Active Living Assessment Tools: Codebook & Scoring* handbook (Hartley et al., 2009) for completion of audits.

The TWA is composed of 18 town demographics and characteristic items (e.g., county population, town topography, and location of schools) and 15 recreational amenity questions (e.g., hiking/biking/walking trails, parks, playgrounds, recreational centers) (Yousefian et al., 2010). This component was completed by a trained research staff member (i.e., local rural county coordinators) using publicly available information from the US Census Bureau (U.S. Census Bureau, 2021; U.S. Census Bureau) and contacting (i.e., via telephone and/or email) local town officials for clarification (i.e., any potential changes and most up to date availability of amenities) and/or missing data.

The PPA consists of 11 questions across four domains (i.e., town policies, town programs, school policies, and school programs). This component evaluates the presence or absence of town and school programs (e.g., local public transportation, sponsored PA initiatives for students) and policies (e.g., requirement of bikeways or pedestrian walkways in new public infrastructure projects, public recreation department that offers PA programs) that could contribute to active living within the community. This portion was also completed by the designated local rural county coordinator, who collected the relevant data by contacting (i.e., via telephone and/or email) local town officials, town recreation directors, school faculty/administration, parks directors, and church directors.

The SSA is a 25-item observational audit of individual street segments within the towns. This component characterizes walkability (e.g., sidewalks, safety features, road/traffic characteristics), land use (e.g., residential, commercial, industrial, public/civic), and aesthetics. Features that affect segment walkability were noted for their presence or absence, as well as condition, if present. Observations related to land use were recorded including the presence and condition of public/civic destinations (e.g., playground, post office, community center), commercial destinations (e.g., restaurant, convenience store, small retail), and schools within each segment. To complete this assessment in the current study, first, "ground-truthing," or verifying existing and absent street segments, boundaries and locations (Caspi and Friebur, 2016), was conducted by trained research staff members (i.e., local rural county coordinators). Following, diverse types of street segments for each county and corresponding towns [(Hale: Greensboro, Sawyerville, Newbern), (Greene: Eutaw, Boligee, Forkland), (Marengo: Demopolis, Linden, Dixons-Mills), (Choctaw: Butler, Lisman, Pennington); (Dallas: Selma, Orrville, Valley Grande); (Sumter: Livingston, York, Cuba)], four segments per zone (i.e., town center, thoroughfare, neighborhood, and isolated school zone) were selected following the RALA tool guidelines. Further, this selection was based on the areas within the vicinity of the residence of participants involved in the ongoing PA RCT (Brown et al., 2021) to appropriately capture their proximal environmental/neighborhood features. Briefly, the four zones consisted of the town's central point (town center); a major highway leading to the town's center (throughfare); residential area with minimal through traffic

(neighborhood); and a school that is not a part of another zone (isolated school zone). Across the six counties, there were 16 segments per county with a total of 96 street segments. Lastly, the trained research staff member mapped out the street segments using Google Maps and scheduled dates/times to audit the selected streets with the local rural county coordinator.

2.3. Scoring and statistical analyses

The TWA and PPA were scored using an algorithm developed by Hartley and colleagues (0–100) (Hartley et al., 2009), with higher scores indicating more opportunity and support for PA. For the TWA, school location and walkability is assessed, for a maximum possible score of 15 points (i.e., "*There is an elementary school in my town that children can walk to.*" Yes, 6 points; No, 0 points). The trails category examines the presence of hiking/walking trails, biking paths, and other types of trails, as well as their distances from the town center (up to 20 points). The parks and playgrounds section assesses the presence of public parks, public playgrounds, school playgrounds, and other types of parks/playgrounds, as well as their distances from town center (up to 25 points). The water activities component assesses if public swimming pools, swimming beaches, rivers with boat/water sport-access, or other water activities are present within 15 miles of town center (up to 10 points). Lastly, recreational activities examine the presence and distance from town center of town recreational facilities, playing field/courts, private fitness facilities, roller/ice skate rinks, and other public access facilities (up to 30 points).

For the PPA component, the town policies section assesses the presence of policies concerning bikeways and pedestrian walkways in the town's infrastructure for a maximum score of 10 points. The town programs section evaluates the existence and accessibility of public recreational departments and organizations within the town (up to 30 points). The school policies section considers after hours public access to facilities and transportation offerings for children (up to 30 points). Finally, the school programs portion evaluates "late bus" transportations options to school programs for children and additional PA initiatives/programs (e.g., afterschool athletics/sports teams) for students (up to 30 points).

The SSA assesses street segment walkability (e.g., sidewalks, Type: *both sides of street, one side of street, intermittent, footpath only, or none)*, land use (e.g., residential type: *single family detached, multi-family homes/apartments, mobile homes, other, or none),* and corresponding condition (i.

e*., Poor/fair, or not well-maintained/shows signs of deterioration* = 1 or *Good/excellent, or well-maintained/shows little to no sign of deterioration* = 2). The two subjective items regarding each street segment's walkability and aesthetics were rated on a 4-point Likert scale (i.e., strongly disagree, disagree, agree, or strongly agree).

Data were summarized using descriptive statistics (frequencies, percentages, means, and standard deviations), as suitable, for the SSA, PPA, and TWA scales. All analyses were conducted using SPSS Version 27 (Chicago, IL).

3. Results

Overall, the demographics across these six rural counties were similar as presented in Table 1. According to 2019 county-level census data, residents were mostly African American (62.2%) adults (>18 years of age) (78.5%) without a bachelor's degree (82.8%). Rates of income (range: $24,145 - $35,892 vs. $62,843 and health insurance coverage (11.8%) in these counties were lower than the national average, whereas the poverty rates for each county were more than double the national average (range: 20.5%-36.4% vs. 10.5%).

3.1. Town Wide Assessment

Across the six counties, the overall TWA score was 49.67 out of a possible 100 points (range: 22–73), indicating low prevalence of schools within walking distance (i.e., within 5 miles of the town's center) and town-wide amenities for PA. Most towns did not have a middle or high school (9.67/15 points) that a child could walk to, or water activities (1.5/10 points) within 15 miles of the town's center. A majority (83%) of the towns had trails (e.g., walking, hiking, and biking) but were not within proximity (>5–15 miles from the town center) resulting in a mean score of 10.17/20 points. As for recreational activities (mean score of 8.33/30 points), there was variation in the presence of town recreational facilities (e.g., YMCA), private facilities (e.g., Gold's Gym, Curves), and playing fields/court. Most of the towns (67%) had a private facility and playing courts, while there was a limited number of town recreational centers (17%). However, there was a high prevalence of parks/playgrounds (20/25 points). Table 2 provides the TWA points and total scores by domain.

Table 1
Resident demographic characteristics by county, US Census Bureau, 2010–2019.

	Hale County	Greene County	Marengo County	Choctaw County	Dallas County	Sumter County	United States
Population, (n) July 1, 2019	14,651	8,111	18,863	12,589	37,196	12,427	328,239,523
Age (%)							
Persons < 18 years	23	21.8	22.5	19.7	23.3	19.0	22.3
Persons ≥ 65 years	19.7	23.3	19.9	23.6	18.9	18.7	16.5
Race (%)							
White	40.7	18.5	46.6	57.1	27.6	25.6	76.3
Black/African American	58	79.9	51.6	41.7	70.7	71.4	13.4
Other	1.3	1.6	1.8	1.2	1	3	10.3
Education (%)							
High school graduate or higher, age > 25 years*	84	79.2	83.8	81.4	81.8	86.7	88
Bachelor's degree or higher, age > 25 years*	14.2	10.1	16.1	11.9	14.7	21.6	32.1
Health (%)							
With a disability, age < 65 years	14.9	15.8	18.5	19.5	12.3	16.5	8.6
Persons without health insurance, age < 65 years	11.6	11.6	11.1	12.2	11.1	13.2	9.5
Income & Poverty							
Median household income (in 2019 dollars) *	$34,046	$24,145	$33,241	$35,892	$33,845	$24,320	$62,843
Persons in poverty (%)	20.5	31.7	24.8	22.6	26	36.4	10.5

Note: *2015–2019

Note: Source US Census Bureau, 2010–2019, Available at https://www.census.gov/quickfacts/fact/table/choctawcountyalabama,dallascountyalabama,sumtercountyalabama,halecountyalabama,marengocountyalabama,greenecountyalabama/PST045221? and https://www.census.gov/quickfacts/fact/table/US/PST045221.

Table 2

Town wide amenity scores by county.

County	Hale	Greene	Marengo	Choctaw	Dallas	Sumter	Mean Score (SD)/ Maximum Points Possible
	Greensboro	Eutaw	Demopolis	Butler	Selma	Livingston	
Town Center							
Domain							
School location	15	6	15	5	6	11	9.67 (4.6) /15
Trails	8	0	16	4	13	20	10.17 (7.5) /20
Parks/ Playgrounds	8	16	23	23	25	25	20.00 (6.8) /25
Water Activities	0	0	0	0	5	4	1.50 (2.3) /10
Recreational Facilities	2	0	9	7	19	13	8.33 (7.0) /30
Total Score	32	22	63	39	68	73	49.67 (21.2) /100

Abbreviation: SD, Standard Deviation.

3.2. Program and policy Assessment

Overall, the existence of PA programs and policies in the six counties was low with a total average score of 24.67/100 as reflected in Table 3. Marengo was the only county identified during our assessment with a town program such as a public recreation department and/or private recreation organization with a sliding fee/scholarship. Most counties (67%) had a school policy that consisted of allowing public access to their recreation facility after school hours. As for school programs, only Sumter County offered sponsored PA initiatives (e.g., football, basketball, baseball) for students in addition to gym/physical education classes. No countywide policies existed that defined requirements for built environment features, such as requiring bikeways and pedestrian walkways in new public infrastructure projects, though policies had been established in one township. None of the counties scored in all six areas of this assessment indicating a lack of programs and policies for each county. However, Sumter County scored highly in the majority (83%) of program and policy domains and received the best overall PPA score (47/100).

3.3. Street segment assessment

A total of 96 street segments were audited across the six counties (i. e., 16 segments throughout a total of 18 towns). Throughout the towns, sidewalks were present in 32% of segments, with 18% on both sides of the street. Shoulders in good condition were found throughout 28% of the segments. Overall, 61% of segments had at least one pedestrian-friendly safety feature (e.g., crosswalks, pedestrian signs, stop signs and public lighting). Conversely, additional safety features like crossing signals (2%), children at play signs (6%), yellow school flashing lights (2%), and speed bumps (3%) were not as common as other features throughout town segments. The average road condition within these segments was 1.87 out of a possible 2 points. Though present in all counties, only 24% of segments had non-vehicular routes (e.g., sidewalks, bike paths, trails) with connectivity to other segments and other parts of town. There was variance in land use within the segments. Public/Civic destinations (e.g., post office, courthouse, playground)

were the most common (overall, 42% of segments), followed by commercial destinations (e.g., restaurant/café, convenience store, small/big box retail) (overall, 28% of segments), then school destinations (e.g., public elementary middle/high school, private school) (overall, 22% of segments). Table 4 provides the street segment characteristics by county.

4. Discussion

This study sought to use the RALA to assess the environmental characteristics and existing amenities, programs, and policies in six underserved rural counties in Alabama as an informative component of an ongoing multi-level lifestyle intervention. The results from the TWA and PPA indicated limited sources of opportunity (e.g., playing courts, trails, parks and playgrounds) and community programs for PA while the SSA findings indicated existing environmental barriers (e.g., crossing signals and crosswalks) that could hinder PA engagement. In addition to informing our ongoing PA intervention, the findings from this study provided implications for future policy efforts.

Overall, our findings were similar to previous findings from studies conducted in Alabama (Robinson et al., 2014), Mississippi (Robinson et al., 2014; Thomson et al., 2019), North Carolina (Hege et al., 2017), Illinois (Dalstrom et al., 2021), Washington (Perry et al., 2015), and Hawaii (Hafoka, 2017). Parks and playgrounds were the most prominent recreational amenity across all six counties based off the TWA which is consistent with results from past RALA studies (Hege et al., 2017; Robinson et al., 2014). Following parks and playgrounds, school location was the second highest domain within the TWA. Schools serve as common locations for rural residents to engage in activity as these entities have outdoor conveniences (e.g., tracks, playing fields/courts). Water activities (e.g., public swimming pools and rivers with canoe/ boat/water sport access) were the least available amenity in all six counties like findings from previous studies (Hege et al., 2017; Robinson et al., 2014; Perry et al., 2015).

Consistent with past results, we noted deficiencies in existing PA programs and policies (e.g., community programs and policies) (Robinson et al., 2014; Dalstrom et al., 2021). There was a paucity of

Table 3

Program and Policy Scores by County.

County	Hale	Greene	Marengo	Choctaw	Dallas	Sumter	Mean Score (SD) /Maximum Points Possible
	Greensboro	Eutaw	Demopolis	Butler	Selma	Livingston	
Town Seat							
Domain							
Town Policies	0	0	10	0	0	0	1.67 (4.1) /10
Town Programs	0	0	10	10	26	22	11.33 (10.9) /30
School Policies	15	15	0	15	0	15	10.00 (7.7) /30
School Programs	0	0	0	0	0	10	1.67 (4.1) /30
Total score	15	15	20	25	26	47	24.67 (11.9) /100

Abbreviation: SD, Standard Deviation.

Table 4
Street segment characteristics by county.

County segments	Hale (N = 16)	Greene (N = 16)	Marengo (N = 16)	Choctaw (N = 16)	Dallas (N = 16)	Sumter (N = 16)	Overall (N = 96)
Towns	Greensboro Sawyerville Newbern	Eutaw Boligee Forkland	Demopolis Linden Dixons-Mills	Butler Lisman Pennington	Selma Orrville Valley Grande	Livingston York Cuba	
Total number of present feature (total number of present feature/number of segments %)							
Sidewalks Present	5 (31)	4 (25)	6 (38)	3 (19)	8(50)	5 (31)	31 (32)
Both Sides of street	3 (19)	1 (6)	4 (25)	1 (6)	3 (19)	5 (31)	17 (18)
Other*	2 (13)	3 (19)	2 (13)	2 (13)	0	3 (19)	12 (13)
Shoulders Present	5 (31)	5 (31)	4 (25)	4 (25)	2 (13)	7 (44)	27 (28)
Any Safety Feature Present	8 (50)	7 (44)	8 (50)	10 (63)	10 (63)	16 (100)	59 (61)
Crosswalks	3 (19)	1 (6)	4 (25)	4 (25)	3 (19)	3 (19)	18(19)
Crossing Signals	0	0	1 (6)	0	1 (6)	0	2 (2)
Pedestrian Signs	1 (6)	1 (6)	1 (6)	1 (6)	4 (25)	5 (31)	13 (14)
Children at Play Signs	0	2 (13)	2 (13)	0	1 (6)	1 (6)	6 (6)
Traffic Lights	2 (13)	0	4 (25)	2 (13)	4 (25)	5 (31)	17 (18)
Stop Signs	3 (19)	3 (19)	2 (13%)	1 ()	4 (25)	8 (50)	21 (22)
School Flashing Lights	0	0	1 (6)	0	1 (6)	0	2 (2)
Speed Bumps	1 (6)	0	1 (6)	0	1 (6)	0	3 (3)
Public Lighting	1 (6)	5 (31)	4 (25)	4 (25)	2 (13)	4 (25)	20 (21)
Average Road Condition**	1.89	1.89	1.94	1.89	1.69	1.94	1.87
Connectivity***	4(25)	3(19%)	3(19)	3(19)	4 (25)	6(38)	23(24)
Land Use							
Public and Civic Destinations	5 (31)	5 (31)	9 (56)	6 (38)	9 (56)	6 (38)	40 (42)
Commercial Destination	2 (13%)	4 (25%)	5 (31%)	5 (31%)	5 (31%)	6 (38%)	27 (28%)
School Destination	3 (19%)	3 (19%)	4 (25%)	2 (13%)	4 (25%)	5 (31%)	21 (22%)
Subjective Assessment							
Walkable Segment	12 (75%)	7 (44%)	12 (75%)	15 (94%)	3 (19%)	13 (81%)	62 (65%)
Pleasing Aesthetics	14 (88%)	15 (94%)	15 (94%)	16 (100%)	14 (88%)	15(94%)	89 (93%)

*One side of street only, intermittent, or footpath.
**1 (Poor/Fair, 2 (Good/excellent).
***Do sidewalks, bike paths, or other trails link segment to other parts of town or to another segment or road?.

community programs (i.e., PA programs for local youth) and policies (i. e., requiring inclusion of bikeways or pedestrian walkways in new public infrastructure projects). In contrast, previous assessment of Mississippi (Robinson et al., 2014), Illinois (Dalstrom et al., 2021), and Washington (Perry et al., 2015), showed an existing town policy requiring bikeways or pedestrian walkways in new public infrastructure projects. Though most counties in the current study (i.e., Choctaw, Marengo, Dallas, and Sumter) had a public recreational department that offered PA programming, these programs were restricted to the local youth (ages 3–16) except for Dallas County where programs are also offered to adults 18 years and older. Similar barriers with programs promoting PA were reported also reported for Illinois (i.e., public use of school facilities and resources afterhours for PA required insurance, scheduled use, and costs) (Dalstrom et al., 2021) and Hawaii (i.e., offered PA programs but sliding scales ranged from $0–230 introducing affordability concerns) (Hafoka, 2017).

Findings from the Street Segment component indicated a low presence of pedestrian-friendly safety features throughout the six counties. Though there were few sidewalks, most were in good condition similar to the previous study conducted in Alabama and Mississippi (Robinson et al., 2014). Of the existing safety features, crossing signals, children at play signs, and speed bumps were the less prevalent in a majority of the areas audited comparable to issues found in studies conducted in North Carolina, Alabama, and Mississippi (Hege et al., 2017; Robinson et al., 2014; Perry et al., 2015). In contrast, findings from assessments conducted in Washington, Hawaii, and Lower Mississippi Delta show a higher existence of certain safety features (i.e., children at play signs, crosswalks, and public street lights) (Thomson et al., 2019; Perry et al., 2015; Hafoka, 2017).

Despite the limited amenities for PA, the findings from this study allows us to inform our ongoing PA intervention. Leveraging the existing amenities and resources, we are distributing monthly newsletters to

participants highlighting amenities such as local parks, walking trails, recreational facilities along with important relevant details (e.g., distance from town center and available activity offerings) that were collected with the TWA and PPA. The contacts with local town officials, town recreation directors, school faculty/administration, parks directors, and church directors provided information (e.g., location open/ closing times) that is not available publicly on websites or has changed due to COVID-19 closings and modifications.

Along with the environmental barriers that were found, the current study indicates minimal or no changes in town and school-related programs and policies in Sumter since 2011. This could be due to low prioritization and/or resources as an important issue among local leaders, policy makers and community members. However, this lack of change calls for implementation of policy (e.g., allowing the public use school facilities after hours and requiring inclusion of bikeways or pedestrian walkways in new public infrastructure projects). As a part of dissemination, we plan to distribute infographics with our general findings to community residents, leaders, and policy makers to highlight the need to address and improve environmental barriers to PA which could, in turn, decrease the high prevalence of inactivity and incidence of disproportionate chronic disease and mortality. In terms of limited resources, the most recent available budget data (2015–2016) for parks and recreation was only reported for Marengo ($80,000) and Dallas ($207,782) as it was not reported for Choctaw and Greene counties, and not applicable for Hale county (Association of County Commissions of Alabama (ACCA), 2016). There are significant differences in allocated budget ranges for rural counties (those reported for Marengo and Dallas from the current study and other counties). For other rural Alabama counties (e.g., Blount, Cullman, Russell), budgets ranged from $226,674 to $620,000 for parks and recreation (Association of County Commissions of Alabama (ACCA), 2016). The low budgets for Marengo and Dallas indicate a potential need for budget prioritization. The dated and lack of

updated information on county-level budgets for parks and recreation is a limitation and indicates a need for regular releases and consistent reporting considering the important role that PA plays in addressing many of the health disparities and concerns in this region.

5. Strengths and limitations

A strength of this study is the application of the RALA, an established measure that has been used in diverse rural communities across the US (Hege et al., 2017; Robinson et al., 2014; Thomson et al., 2019; Perry et al., 2015; Hafoka, 2017; Dalstrom et al., 2021). This study utilized all three components of the RALA tool whereas a previous study selected only two of three portions due limited scope of research (i.e., focused on accessibility, availability of built environment components, and walkability) (Hege et al., 2017). Another notable strength of the current study was the incorporation of well-trusted, knowledgeable community residents and local rural coordinators to help collect TWA and PPA data.

There are limitations to note. First, validity and reliability has not been established for the RALA tool. However, inter-reliability for the Street Segment Assessment has been assessed (k = 0.78, substantial) across seven rural areas in the northeast (i.e., Maine), South (i.e., Alabama, Mississippi, and Kentucky), and west (California) (Yousefian et al., 2010). Despite the limited data on reliability and validity, RALA is a useful tool to record unique characteristics (i.e., variation in physical environment, settlement patterns) that contribute to PA behavior at the rural community level (Yousefian et al., 2010). The SSA component features Likert-scaled, subjective portions (i.e., walkability and aesthetically pleasing nature of segment) which could vary from person to person and potentially introduce response bias. Further, we did not collect any data related to existing community programs prior to COVID-19; therefore, some PPA domains (e.g., town programs, school programs and policies) might underestimate what is available now that the pandemic has passed. Lastly, this study was conducted in rural Alabama regions and thus findings may not generalize to other regions.

6. Conclusion

The current study provided valuable insights on extant and deficient PA-related resources/amenities, community programs, and policies in six rural Alabama counties. These findings helped identify limited opportunities for engagement in PA, as well as important barriers that should be addressed to potentially increase resident PA for our ongoing PA intervention and inform future policy efforts. To move this field forward and advance efforts to address PA environment concerns in rural areas, further assessment, and community engagement is warranted. Thus, educational campaigns, town hall meetings, and work groups can be established to delve deeper in community standpoints to gain traction with local leaders and policy makers.

CRediT authorship contribution statement

Nashira I. Brown: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **Lauren Stewart:** Formal analysis, Writing – original draft, Writing – review & editing. **Laura Q. Rogers:** Conceptualization, Investigation, Visualization, Writing – original draft, Writing – review & editing. **Mary Anne Powell:** Supervision, Writing – original draft, Writing – review & editing. **Claudia M. Hardy:** Methodology, Resources, Writing – review & editing. **Monica L. Baskin:** Methodology, Resources, Writing – review & editing. **Robert A. Oster:** Formal analysis, Software, Writing – review & editing. **Maria Pisu:** Writing – review & editing. **Wendy Demark-Wahnefried:** Writing – review & editing. **Dori Pekmezi:** Conceptualization, Formal analysis, Investigation, Methodology, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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