Community Input for addressing Dementia Health Disparities: Richmond Brain Health Initiative

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ABSTRACT

Background: The development of the Richmond Brain Health Initiative (RBHI) was guided by the need to address local brain health service gaps to improve Alzheimer's/Dementia health disparities in racially diverse communities. This paper describes the establishment of RBHI through 1) community and provider stakeholder input and 2) community brain health screening/intake development and testing.

Methods: Phase 1 involved provider and community stakeholder questionnaires to gather feedback as part of the Plan-Do-Study-Act (PDSA) cycle. Subsequently, stakeholder findings directed the RBHI structure and screening/intake registration testing in the community.

Results: Based on the stakeholder responses from fifteen providers and twenty community members, there was strong consensus in the need for local brain health services. The most highly recommended screening needs were for caregiving, cognitive status, and lifestyle risks. Thereafter the RBHI screening/intake was developed and completed by 45 community participants. Participants showed hypertension (62%) as the most prevalent brain health risk factor, followed by depression/anxiety (56%), and loneliness (44%). The intake also indicated cognitive and functional deficits, with the Montreal Cognitive mean equaling 18.4 and the Functional Activities mean equaling 14.9. Additionally, 73% of participants reported experiencing subjective cognitive decline.

Conclusion: This study showcases a model for promoting brain health in racially diverse communities to improve access to ADRD resources and services.

KEYWORDS: Alzheimer’s Disease, Brain Health, Community-health, Dementia, Health Interventions, Health Disparities

INTRODUCTION

While exemplary brain health programs exist in several locations,[1] care for Alzheimer's disease and related dementia (ADRD)is far less robust than needed. Subsequently due to inequitable access, racial minority populations are at greater risk for ADRD.[2] Recent work has highlighted that Black adults have the highest ADRD prevalence (14.7%), followed by Hispanic (12.9%), non-Hispanic White (11.3%), American Indian/Alaska Native (10.5%), and Asian/Pacific Islander (10.1%) across U.S. older adults.[3,4] Historically, ADRD brain health programs have not focused on the complex needs of low-income racial minority communities.[5] To address service gaps that can lead to ADRD health disparities, we created the Virginia Commonwealth University (VCU) Richmond Brain Health Initiative (RBHI) to implement a telephone-based ADRD aging services navigator, ADRD health screening, brain health risk reduction intervention, and caregiver support program (Figure 1).

Intervention opportunities to address health disparities can include reducing ADRD risk factors, increasing synergistic ADRD partnerships, and raising awareness of ADRD risk within and across Black and Brown communities.[6,7] With a shift to the preventive ADRD paradigm, more diverse people will need ADRD education, evaluation, diagnosis, and care navigation, making brain health models more relevant across diverse communities. With primary care playing a critical role in screening and diagnosis,[8] the U.S. healthcare infrastructure must prepare for increasing ADRD care demand, by creating more inclusive community-based options.[9] For example, recent reports such as The Milken Institute Center for the Future of Aging[10] recommend improving ADRD care by building a dementia workforce system capacity through brain health initiatives that include community care navigation.[11]

RBHI Objectives

Internal pilot funds supported initial RBHI development and determination of community capacity. After, RBHI expanded with three-year funding from the U.S. Administration on Community Living: Alzheimer's Disease Programs Initiative (ADPI)[12] to increase dementia-capable home- and community-based services (HCBS) that provide support to individuals living with ADRD and their caregivers. Specifically, RBHI aims to improve the region's dementia capability by 1) identifying people with cognitive changes and connect them to providers; 2) educating the community about brain health, including risk factors for dementia, signs of cognitive problems, dementia symptom management, support program availability, and opportunities for research participation; 3) conducting program implementation to improve ADRD identification, screening, communication, education, prevention, intervention, evaluation, and innovation. This paper describes an ADRD community telephone-based brain health initiative developed through 1) conducting an ADRD community and provider stakeholder questionnaire and 2) developing and testing a community brain health RBHI screening/intake form, as steps to improve local dementia capability and equity.

PROGRAM DEVELOPMENT

Population and Setting

Richmond inhabits 229,395 individuals, with the broader metro service area home to a little over 1 million residents.[13] Within the RBHI service area, approximately 20% of residents are aged 60 and older, of which 28% identify as Black. Following national trends, the older adult population is expected to more than double by 2040.[14] We are centralized within Richmond, because of its racial diversity and due to having the highest percentage of Medicare beneficiaries diagnosed with ADRD in Virginia, at 13%, compared to national and state 10% prevalence rates.[15]

Furthermore in local survey of older adults living in Richmond, 7.1% have reported cognitive difficulty and 6.0% reported difficulty with independent living.[16,17]

The census tracts served by VCU Health System have Richmond's highest poverty and health disparity rates.[18] Poverty is prevalent in the region; 37.8% of older adults live below 200% of the federal poverty line.[19] The impact of poverty is reflected in a life expectancy of 63 years in the poorest neighborhoods and 83 years in the wealthiest areas.[20] The premature age-adjusted mortality varies across race in the region. The premature age-adjusted mortality rate in Richmond for all populations is 480 per 100,000, but is 700 Black residents.[21] Furthermore, Richmond's national ranking for poor health outcomes (100/133) and health behavior (126/133) are alarmingly high,[22] supporting a need to address their increased ADRD risk.[16,17]

Connecting Clinical and Community Services

Professionals from our academic medical center (VCU departments of Gerontology, Nursing, Neurology, and Geriatrics) created a partnership to address Richmond's complex brain health gaps. Specifically, Gerontology reached out to Nursing/Geriatrics, and then Nursing/Geriatrics reached out to Neurology. Subsequently, RBHI is co-directed by three faculty members, one each from Gerontology, Nursing/Geriatrics, and Neurology to create a comprehensive ADRD care approach. The team built reciprocal brain health partnerships with local safety nets, considered the main stakeholders addressing ADRD needs. These agencies included the Alzheimer's Association chapter (for public advocacy/resources), Area Agency on Aging: Senior Connections (for aging services), and the State of Virginia Department for Aging and Rehabilitative Services (for public health). We also contacted the closest memory centers: the Riverside Center for Excellence in Aging & Lifelong Health: Memory Care, the University of Virginia: Memory Clinic, and Eastern Virginia Medical School: Geriatrics/Memory Care. We

had linkages with all the identified ADRD state stakeholders in varied capacities through the Virginia Department of Aging and Rehabilitation Services: ADRD Commission.

RBHI Framework of Support

Two programs integrally supported the development of RBHI: 1) the VCU Richmond Health and Wellness Program (RHWP) and 2) the VCU Institute for Inclusion, Inquiry, and Innovation (iCubed).[23,24] RHWP is an interprofessional wellness program that serves local older adults in low-income housing. The ambulance authority has observed a high chronic disease burden and ambulance/emergency department use in the RHWP service area.[25] In response, RHWP offers weekly student-supported on-site wellness clinics in low-income older adult apartment buildings to promote aging in place and prevent acute health episodes. The Institute of Healthcare Improvement's "Age-Friendly Health Systems Guide to Using the 4Ms in the Care of Older Adults" guides RHWP practice.[26] RHWP partnered with iCubed to develop the iCubed Health and Wellness Across the Lifespan (iCubed HWA) transdisciplinary research core.[23] iCubed HWA engages in practice-informed programs in a feedback loop with community residents, healthcare providers, scientists, and community partners through research and service delivery. This programmatic framework allows RBHI to strategically build relationships and collaborate to address brain health inequities within a community-embedded scientific approach.[27] Unmet brain health needs were consistently identified through our iCubed HWA cognitive health research.[28] The team would also regularly receive referrals for brain health support[29], but because the Richmond metro region is a brain health desert we had no local memory center or brain health center to connect participants.

Community Feedback

Our team applied an asset capacity building and needs assessment approach[30,31] for establishing RBHI. Developing brain health services need to go hand in glove with attention to the structure and context in which individuals live.[32] Community/organizational feedback is critical to building an acceptable brain health initiative that bridges existing resources and fills service gaps. This approach allowed our team to identify the community and healthcare organizational needs while respecting existing programs. We used a stakeholder questionnaire to identify resources and existing programs to aid RBHI and the screening/intake registration form development. Stakeholders rated four RBHI proposed services (screening, education, coaching, and monitoring) and rated the services by importance, relevance, helpfulness, and addressing a gap. They were also asked to identify what brain health programs and services are needed, and what should be assessed/screened by RBHI. We used the Plan-Do-Study-Act (PDSA) cycle for rapid feedback and process improvement within a complex adaptive systems model (Figure 2). The complex adaptive system facilitates a feedback loop from service, community partners, screening/intake, and implementation processes.[33] After collecting stakeholder data, we refined RBHI and vetted the reconceptualization with the provider and community stakeholders before implementation.

METHODS

Objective 1: Collecting Stakeholder Data

Stakeholder questionnaires were created by the primary investigators to gather information about brain health needs and to evaluate RBHI proposed components. The questionnaires were vetted with the iCubed HWA research team prior to implementation. VCU Institution Review Board (IRB) provided exempt status for the stakeholder questionnaires.

Provider Stakeholder Questionnaire: We contacted the healthcare providers identified by the state as Virginia ADRD stakeholders and key local aging network organizations to complete a 20-30 minute stakeholder questionnaire. We also instructed the providers to share the link with other individuals and organizations we needed to include. Providers represented the following fields: community advocacy, housing, nursing, pharmacy, primary care clinicians, public health/state department, public health researchers, and social work. We emailed the providers the stakeholder questionnaire with a Research Electronic Data Capture (RedCap) link. The email stated that participation in the questionnaire would indicate interest in the RBHI partnership role. Purposive recruitment via email reminders and phone calls continued until all key organizations provided feedback. Demographics for the stakeholders were not collected due to the small sample, to promote confidentiality.

Community Older Adult Stakeholder Questionnaire: We invited older adult residents from RHWP (55+ years old) who had participated in previous ADRD risk reduction research[29] to complete the community 20-30 minute stakeholder questionnaire. Recruitment continued until responses from a convenient sample of twenty individuals were collected, relatively balanced with the provider stakeholder sample size. The research coordinator administered the RedCap questionnaire over the telephone (80%) or in person at a local community health location (20%) using structured interview style presentation, guided by the questionnaire. Community study participants were paid $25 for study compensation. Demographics for the stakeholders were not collected due to the small sample, to promote confidentiality.

Objective 2: Screening/Intake Development and Testing

Using the PDSA cycle from the stakeholder feedback phase of the model building, we created the RBHI brain health intake form to address the reported needs and asset capacity

building. Based on stakeholder feedback, ADRD and aging services were both needed. Thus, the community screening/intake brain health form, modeled on the validated Care Ecosystem instrument,[34] was designed to connect individuals to ADRD and aging services. We used an iterative process, where once we completed the intake, we vetted it with provider and community questionnaire stakeholders prior to implementation.

The developed form takes approximately 30 minutes to complete. It includes clinical cognitive screening using the Montreal Cognitive Assessment-digital (MoCA®, 0-30 score [lower score indicative of cognitive impairment] 20-25=Mild Cognitive Impairment, <20=Cognitive Impairment)[35] and the Functional Activities Questionnaire (FAQ, 0-30 score [higher score indicative of impairment] <9=impaired function and possible cognitive impairment)[36], and ADRD risk factors (dichotomous assessment). The screening/intake testing was not considered research; IRB designated it as a quality improvement demonstration project. Thus, the VCU IRB decided that approval was not applicable for the screening/testing phase.

In the implementation phase, we tested the screening/intake form with a convenience sample recruited from local health fairs, RHWP visits in low-income housing, and Geriatric/Neurology VCU clinics between April and August 2022. Participants scoring at impairment levels on the MoCA® or FAQ were counseled about connecting with their primary care for follow-up. Based on needs reported, counseling, connections, and referrals were made by RBHI navigators. Navigators had a minimum bachelor's degree in a health-related field, with ADRD or aging community health worker experience, and MoCA® certification.

RESULTS

Objective 1: Findings from the Stakeholders

Tables 1-2 present the provider and community stakeholder questionnaire results. Fifteen providers submitted responses; provider stakeholders represented ADRD public health agencies/hospitals (40%) and home- and community-based agency/service providers (not ADRD specific, 60%). Twenty community stakeholders' responses represented a range of brain health interests and experiences, with the majority reporting a need for personal brain health support services (95%).

Results indicate a need for case management services to support older adult brain health, reported by 87% of providers and 95% of community stakeholders. Regarding what services RBHI should offer, half of the providers highly rated case management (53%) and screening/referral (53%) services. In comparison, community stakeholders provided the highest ratings for social support services (95%) and case management (90%). There was high consensus within community stakeholders' ratings across all presented services. Providers and community stakeholders rated RBHI proposed services favorably, projected as helpful (100%), highly used (80% and 95%), and addressing local ADRD service gaps (93% and 100%), with community stakeholders presenting higher ratings. Providers showed greater interest in having a statewide ADRD patient registry (100%) compared to the community stakeholder group (85%).

Providers had 100% consensus for including lifestyle risks, cognitive comorbidity risks, and depression status in an RBHI screening/intake form. Similarly, we found consensus (100% agreement) among the community stakeholders about the need to include a depression screening in the assessment and RBHI screening/intake form. Providers reported the least interest in having clinical health needs (73%), and the community stakeholders reported the least interest in having cognitive comorbidity risks (75%), substance abuse (70%), and sleep problems (75%) in the RBHI screening/intake form.

Objective 2: Findings from the Screening/Intake Form

RBHI registered 45 individuals for the initial implementation phase. Sample demographics represent the Richmond community with a mean age of 72 years, 57% female, 34% Black, and 43% living alone, with most screening participants indicating self-reported ADRD risk (64%). Screening results show a need for brain health support based on average cognitive health scores (MoCA® mean=18.4; FAQ mean=14.9). Nearly 73% of the sample reported subjective cognitive decline in the past six months. Participants indicated their highest health and lifestyle risks to be hypertension (62%), depression and anxiety (56%), and experiencing loneliness (44%). Participants reported that traveling (43%), shopping (40%), and managing appointments/dates (30%) were the most difficult functional tasks. Participants requested memory screening (74%) and brain health education (64%) as the most needed brain health services. Table 3 presents the sample population characteristics and comprehensive screening/intake results. Of the 45 individuals registered, 22 engaged in an RBHI intervention service. Participants that accepted RBHI intervention were mostly 60 years old or older (77% [n=17]), male (60% [n=13]), urban residing (60% [n=13]), and Black (55% [n=12]). A few were veterans (18% [n=4]) and many were living alone (41% [n=9]).

DISCUSSION

The stakeholder questionnaire findings from the initial implementation phase highlight a need for a program that addresses ADRD brain health and wellness needs. The stakeholder survey findings showed strong consensus for a brain health/aging service program, with more variation within provider stakeholders for brain health/aging services needed. The community members almost overwhelmingly agree with the services that should be offered and see a need for all the proposed RBHI interventions. These finding verified the need and the structure for a

comprehensive community-facing brain health program and emphasized the importance of educating providers on community needs.

Accordingly, each phase of the RBHI model development used the PDSA cycle for rapid feedback and process improvement within a complex adaptive systems model (Figure 2). Using the input from the stakeholder phase of the model building, we created and vetted a brain health model to address the reported needs and asset capacity building to utilize existing organization resources (Figure 1). RBHI's community/organizational feedback was used to reflect the local community's social, cultural, and economic context to deliver equitable access and risk reduction.[32] We shared our findings back out with the stakeholders and community at large, to vet our interpretation of findings. Based on the feedback we received, RBHI has focused on providing ADRD wellness support by offering: 1) ADRD Care Ecosystem navigation for those living with ADRD, 2) ADRD screening and risk reduction, and 3) support for caregivers of persons living with ADRD.

1) Living with ADRD: Care Ecosystem Navigation

The community stakeholder input emphasized the prioritization of case management and connection with the aging and social services. The VCU ADRD Navigator program (based on Care Ecosystem)[34] connects individuals to both clinical and aging services. Care navigation is a support program for individuals with brain health needs that can be delivered in-person or over the phone. Individuals learn to navigate local community health resources, connect with providers, and address unmet needs. The success of the RBHI care navigation relies on a reciprocal pipeline between VCU Health System and community ADRD services. Clients are connected to our ADRD Navigator system through internal VCU and community referrals. Internal referrals can come through VCU Health clinics such as Neurology and Geriatrics.

Individual and caregiver needs are assessed and screened by the ADRD Care Coordinator and then connected with RBHI. RHWP and the Area Agency on Aging are examples of reciprocal community referrals to RBHI. A better connection to local community aging services is anticipated to improve sustained independent living measured by time, aging in place, or transfer to supportive care, as indicated by lower crisis risks.

2) ADRD Screening and Risk Reduction

The screening/intake form and our team's previous research findings indicate community cognitive deficits without an ADRD diagnosis.[37] A critical finding from the current study identified the need for cognitive screening and primary prevention based on average cognitive health scores indicating cognitive deficits. There were also high levels of subjective cognitive decline, high prevalence of ADRD risk factors, and a high interest in screening/education/brain health risk reduction services. About a third of Alzheimer's disease cases worldwide are attributed to modifiable risk factors, particularly psychosocial-behavioral risk factors: memory/cognitive ability, depression, stress/anxiety, and lifestyle factors: excessive alcohol use, physical inactivity, smoking, and social isolation.[38] Due to the stakeholder interest and to address individuals at increased risk of developing ADRD, we are implementing a telephone-based ADRD lifestyle coaching wellness intervention[29] to those with ADRD risk factors/concerns. Therefore, RBHI prioritizes healthier lifestyle behaviors to reduce the risks of Alzheimer's disease/Dementia.[39] The ADRD risk reduction component is based on our team's previous research.[29] In this program, individuals learn to reduce their risk for brain health impairments, address solutions for personal health concerns, and address lifestyle changes for health and wellness.

3) Support for Caregivers of Individuals Living with ADRD

The stakeholder findings indicated caregiver service needs. Therefore, we aim to offer caregiver support services to address caregiver burden and burnout. Asset capacity building enabled us to support Richmond ADRD caregivers by partnering with Riverside Center for Excellence in Aging & Lifelong Health to offer the telephone-based Benjamin Rose Institute on Aging Care Consultation (BRI) intervention.[40] Care Consultation is a 9-month support program for individuals with brain health needs and their caregivers. ADRD caregivers learn how to organize family care, anticipate what to expect with ADRD, improve tasks of daily living, and address emotional support.

Program Costs

Funding support from the Administration for Community Living – U.S. Department of Health and Human Services expanded RBHI's mission to increase ADRD health intervention services and meet Virginia's mission for dementia capability with $1.19 million in support over three years.[41] RBHI expansion mission has a projected $500,000-$1 million annual budget for ongoing RBHI operations, growth, and sustainability. Payment/billing models exist for education and care navigation. Yet, the literature is underdeveloped for understanding if brain health models of care can sustain most or all the support services through fee-for-service Medicare payment mechanisms. Improving payment models in the Medicare and Medicare Advantage plans, including Institutional Special Needs Plans (I-SNPs) that support assisted living communities and nursing facilities to expand telephone-based care coordination, could benefit older adults with ADRD and their caregivers.[10]

NEXT STEPS

We are monitoring the number of persons reached, their demographic makeup, and outcome assessments to determine community-level reach among Black older adults. A data-driven

approach will aid in strategically expanding RBHI and inform the scientific and service community with a model for reaching Black older adults to address ADRD support and reduce ADRD health inequities and disparities. To examine impact, evaluation instruments embedded in RBHI are: Quality of Life-AD[42], Alzheimer's Disease Knowledge Scale (ADKS)[43], and Healthy Days Core Module[44] (see outcomes Figure 1). A formal evaluation is conducted semi-annually to ensure continuous quality improvement across objectives. We are conducting outreach by explicitly offering ADRD support for 1,500 RHWP community residents over three years.

Barriers

This work needs to be replicated to examine stakeholder bias effects, such as demographics and research experience, race-based cutoffs, and integration with larger sample sizes and more diverse communities, to address limitations of this study. While our core is diverse and has history working with the community for nearly a decade, future work needs to explore how the team and participant makeup may have affected findings. Furthermore, while our team has been working with and is well-integrated within the community, we will continue to focus on community hesitancy and brain health literacy by dedicating time and effort to community adoption and education.[23,45,46] Improving brain health outcomes will require a community health solution with our partners. We acknowledge the need for broader community member engagement and continued refinement over time to meet needs comprehensively. Targeting ADRD risk factors (e.g., smoking/alcohol, physical inactivity, social engagement, medical adherence) is beneficial[47] but highly challenging for multiple reasons, including low lifestyle risk behavior literacy, motivation, self-efficacy, and knowledge barriers.[48] Furthermore, continued sustainability is a significant challenge and opportunity for RBHI. Capacity building and

sustainability will bring new partnerships with challenges to support the financial infrastructure of the RBHI model.

CONCLUSIONS

A strategic community-integrated brain health wellness model can improve existing models of geriatric care by reaching racially diverse residents to provide ADRD education, brain health services, and resource access. To support ADRD health equity, our team enhanced the delivery of supportive services centralized within our local underserved community through outreach (screening at easily reached locations in underserved areas), using the PDSA cycle for rapid feedback and process improvement (Figure 2). Findings from our work were then shared with the community to build awareness about and efforts around the RBHI's capability and reach. This communication feedback loop will continue regularly to ensure that community needs are being met while providing advanced evidence based brain health support.

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Table 1. Provider and Community Stakeholder Survey Participant Characteristics

Participant Descriptors	
Provider Stakeholders	**(n=15)**
ADRD clinical treatment provider	2 (13.3%)
ADRD public health agency organization service	4 (26.7%)
Primary care clinical treatment provider	2 (13.3%)
Government-based home- and community-based agency provider	2 (13.3%)
Public community home- and community-based agency provider	4 (26.7%)
Private community home- and community-based agency provider	1 (6.7%)
ADRD home- and community-based organization provider	0 (0.0%)
Faith-based Organization	0 (0.0%)
Community Stakeholders	**(n=20)**
ADRD Context	
No memory problems	6, (30.0%)
Providing care for someone with a memory condition	3 (15.0%)
Support personal brain health/memory	19 (95.0%)
Support family's brain health/memory	13 (65.0%)
Support a friend's brain health/memory	14 (70.0%)
Support community brain health/memory	15 (75.0%)
Participated in community discussions about brain health/memory	5 (25.0%)
Tested for brain health or memory condition	2 (10.0%)

Participant Descriptors	
Experience	
Discussed with family who has brain health concerns or memory conditions	5 (25.0%)
Participated in a brain health/memory prevention wellness	5 (25.0%)
Spoken to my provider about brain health/memory	5 (25.0%)
Read information about brain health/memory	8 (40.0%)
Received memory screening	6 (30.0%)
Thinking about brain health/memory, but I haven't talked to anyone	3 (15.0%)
Until this survey, I haven't even thought about brain health/memory	8 (40.0%)
I am concerned about my memory	13 (65.0%)

Table 2. Providers and Community Stakeholder Survey Responses

		Providers (n=15)	Community (n=20)
What services are needed to support older adult brain health/memory in your community? (services that are already in place that you would like to improve access to for ADRD individuals) (% agreement)	Administration on Aging services (e.g., meals on wheels, senior centers, home-delivered meals)	7 (46.7%)	18 (90.0%)
	Clinical/Specialty health services	8 (53.3%)	15 (75.0%)
	Clinical ADRD services	11 (73.3%)	15 (75.0%)
	Case management	13 (86.7%)	19 (95.0%)
	Caregiving services	12 (80.0%)	18 (90.0%)
	Housing services	4 (26.7%)	16 (80.0%)
	Mental health/Behavioral services	10 (66.7%)	18 (90.0%)
	Faith-based brain health services	--	20 (100.0%)
	No services needed	2 (13.3%)	0 (0.0%)
What services should the VCU Richmond Brain Health Initiative include to help with community brain health/memory needs? (% agreement)	Administration on Aging services (e.g., meals on wheels, senior centers, home-delivered meals)	4 (26.7%)	15 (75.0%)
	Caregiving services	6 (40.0%)	17 (85.0%)
	Clinical/Specialty health services	6 (40.0%)	16 (80.0%)
	Case management	8 (53.3%)	18 (90.0%)
	Mental health/Behavioral services	(6 (40.0%)	17 (85.0%)
	Screening/Referral services	(8 (53.3%)	17 (85.0%)
	Social support services	(5 (33.3%)	19 (95.0%)
	Peer Support	--	18 (90.0%)
We would also like to know the importance/priority of	ADRD screening referral service/	3.73 (1.16)	4.85 (0.67)

		Providers (n=15)	Community (n=20)
each RBHI service proposed. (1-5 rating, higher scores indicating higher importance) Mean (sd)	Brain health/memory screening		
	ADRD brain health education/ Brain health/memory education	3.72 (0.69)	4.90 (0.45)
	ADRD brain health lifestyle coaching/ Brain health/memory lifestyle coaching	3.79 (0.65)	4.90 (0.31)
	ADRD brain health monitoring/ Brain health/memory monitoring	3.68 (0.65)	4.90 (0.31)
Offering the Proposed Richmond Brain Health (RBH) with ALL four services 1) Brain health/memory screening referral service 2) Brain health/memory health education 3) Brain health/memory lifestyle coaching 4) Brain health/memory health monitoring would … (% agreement)	Be Helpful	15 (100.0%)	20 (100.0%)
	Be Used	12 (80.0%)	19 (95.0%)
	Address Gap	14 (93.3%)	20 (100.0%)
What components should be identified in the Richmond Brain Health Initiative intake/screening inventory? (% agreement)	Advanced care/ End-of-life planning needs	12 (80.0%)	16 (80.0%)
	Caregiving needs	12 (80.0%)	18 (90.0%)
	Cognitive-Memory status	14 (93.3%)	19 (95.0%)
	Lifestyle Risks	15 (100.0%)	19 (95.0%)
	Cognitive Comorbidity Risks	15 (100.0%)	15 (75.0%)

		Providers (n=15)	Community (n=20)
	Depression status	15 (100.0%)	20 (100.0%)
	Clinical health needs	11 (73.3%)	18 (90.0%)
	Drug/Alcohol Substance status	13 (86.7%)	14 (70.0%)
	Sleep problems	14 (93.3%)	15 (75.0%)
	Preferences for design and formatting of the intake/screening inventory form	Structure Checklist 2 (13.3%), Summary Risk Scoring 6 (40.0%), Comprehensive Report 7 (46.7%)	Shared with provider. 16 (80.0%) Shared with Self 20 (100.0%)
State-wide Alzheimer's and Related Disease (ADRD) patient registry. (% agreement)	Interested	15 (100.0%)	17 (85.0%)
	Refer/Participate	15 (100.0%)	17 (85.0%)

Table 3. RBHI Screening/Intake Responses (n=45)

Survey Item		
MoCA® Score Mean (sd) Median IQR	In-Person (74%) Telephone (26%)	18.39 (7.35) 20.50 13.5-22.0
What brings you to the Richmond Brain Health Initiative today? (% agreement)	A healthcare provider told me I have Dementia (Alzheimer's Disease, Vascular Dementia, etc.)	9 (20%)
	I believe I am at risk for dementia	29 (64%)
	I am a caregiver for someone with dementia	5 (11%)
	Other	2 (4%)
Age	Mean (sd)	72.48 (9.59)
Gender (% yes/agreement)	Female	27 (57%)
	Male	20 (43%)
	Non-binary	0 (0%)
	Other	0 (0%)
Race (% yes/agreement)	American\Indian/Alaska Native	1 (2%)
	Black	16 (34%)
	White	26 (55%)
	Prefer not to answer	1 (2%)
Ethnicity (% yes/agreement)	Hispanic or Latino	0 (0%)
Military (% yes/agreement)	Served in Military	11 (24%)
	Did not serve in the military	30 (65%)
	Unknown	5 (11%)
Living Status (% yes/agreement)	Living Alone, with no caregiver	17 (43%)
	Does not live alone	21 (54%)
Living in stable housing that they own, rent, or stay in as part of a household	Yes	34 (76%)
	No	11 (24%)
At risk of losing housing in the next 2 months	Yes	9 (20%)
	No	35 (80%)
Needs-Help with (% yes/agreement)	Advance Care Planning (Living Wills, Medical Directives)	19 (42%)
	Caregiving Support	20 (44%)
	Memory: Cognitive Status Assessment	36 (78%)

Survey Item		
	Lifestyle Risk Reduction (Ex. Exercise, Diet, etc.)	28 (61%)
	Psychosocial Risks (Ex. Social Isolation)	26 (57%),
	Depression or Anxiety	23 (51%)
	Clinical Health Needs (Ex. Cardiovascular Health or Diabetes)	23 (50%)
	Substance Use (Drugs and Alcohol)	8 (17%)
	Sleep Disturbances (Poor Sleep Quality, Insomnia)	26 (57%)
	Community/Aging Services (Nutrition, Housing, etc.)	18 (40%)
Lifestyle Risks (% yes/agreement)	Smoking	3 (8%)
	Drinking alcohol	9 (23%)
	Loneliness	17 (44%)
Functional Ability (Depends on Others or requires assistance) (% yes/agreement)	Writing checks, paying bills, balancing a checkbook	Depends on Others 8 (27%) Requires Assistance 7 (23%)
	Assembling tax records, business affairs, or papers	Depends on Others 8 (27%) Requires Assistance 9 (30%)
	Shopping alone for clothes, household necessities, or groceries	Depends on Others 12 (40%) Requires Assistance 5 (17%)
	Playing a game of skill, working on a hobby	Depends on Others 5 (17%) Requires Assistance 10 (33%)
	Heating water, making a cup of coffee, turning off stove after use	Depends on Others 8 (27%) Requires Assistance 5 (17%)
	Preparing a balanced meal	Depends on Others 8 (27%) Requires Assistance 7 (23%)
	Keeping track of current events	Depends on Others 7 (23%) Requires Assistance 9 (30%)
	Paying attention to, understanding, discussing TV, book, magazine	Depends on Others 7 (23%) Requires Assistance 7 (23%)
	Remembering appointments, family occasions, holidays, medications	Depends on Others 9(30%) Requires Assistance 9 (30%)
	Traveling out of the neighborhood, driving, arranging to take buses	Depends on Others 13 (43%) Requires Assistance 6 (20%)

Survey Item		
FAQ score (9=Dependent on 3 or more /impaired function and possible cognitive impairment)	Mean (sd) Median IQR	14.87 (9.04) 17.00 6.8-21.0
Health Promotion		
	Exercise hours Mean (sd)	2.83 (1.41)
	Social engagement hours Mean (sd)	1.74 (1.04)
	Alcoholic drinks per day	1 or 2 drinks 8 (89%)
	Medical/Medication adherence	Excellent - strictly adherent 4 (50%)
Brain Health Services requesting	Memory screening	31 (74%)
	Brain health education	27 (64%)
	Brain health lifestyle coaching	20 (47%)
	Memory health monitoring	23 (55%)
	Resource navigation	13 (31%)
	Caregiving services	16 (38%)
	Advance care planning	11 (26%)
	Memory clinic information	8 (19%)
	Referral to community services (Senior Center, Meals on Wheels Etc.)	9 (21%)
	Other/Not Listed	4 (10%)
Intervention Eligibility	Care Ecosystem/Navigation	19 (50%)
	Lifestyle Health Coaching	17 (48%)
	Benjamin Rose Institute Care Consultation	15 (40%)
Consents	Monitoring (1-year contact)	33 (73%)
	Research	25 (56%)

Figure 1. Richmond Brain Health Initiative Service Model

The transdisciplinary team, including Institute for Inclusion, Inquiry, and Innovation (iCubed): Health and Wellness in Aging Across the Lifespan Core, supports the goals and initiatives for the RBHI model by providing support for ADRD services and harnessing community resources in Virginia (VA) based on individual needs. Outcome measures are ongoing such as mental/physical health disability days, with findings supporting process improvement, tracking billing to support sustainability, and capacity building.

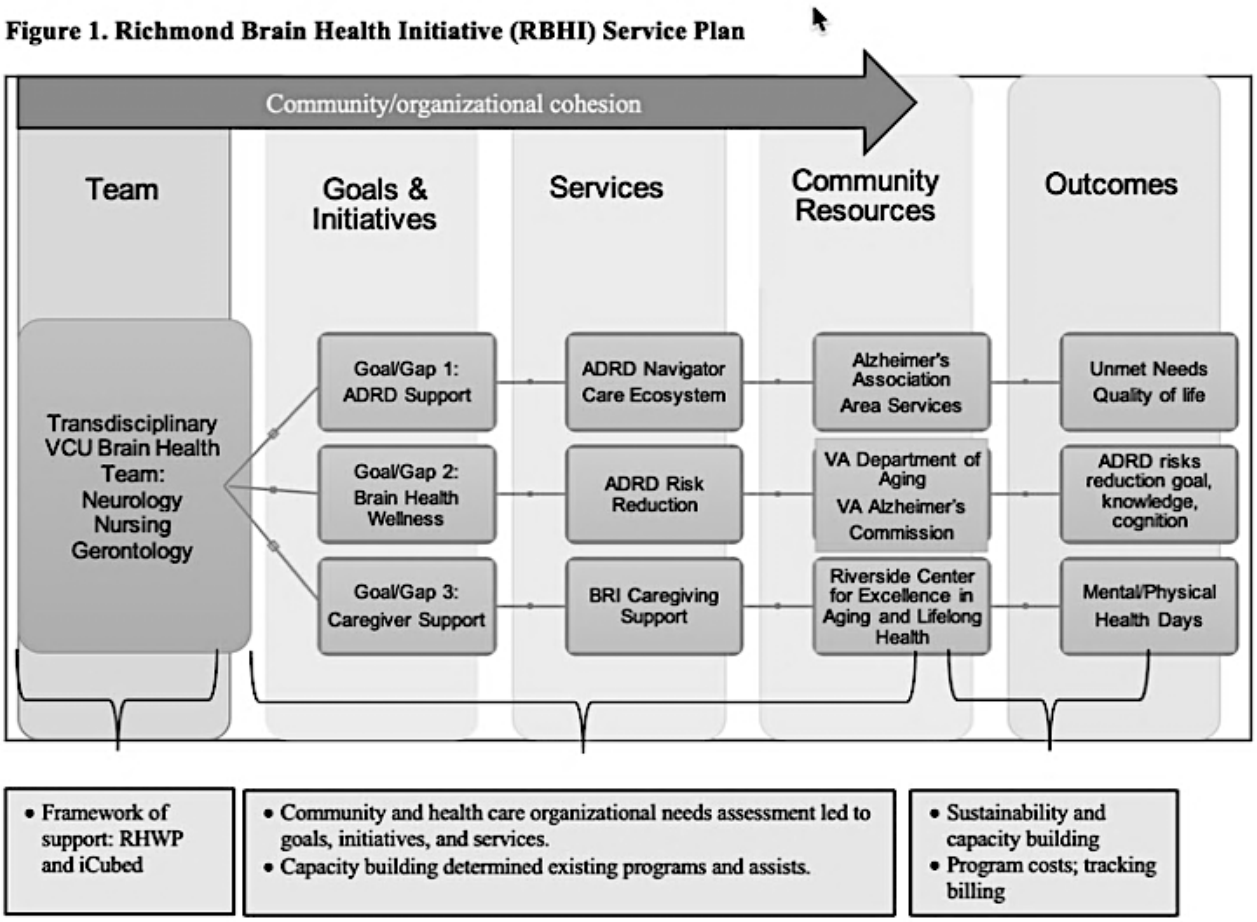

Figure 2. Richmond Brain Health Initiative Development Process

In each phase of the RBHI model development, we use the Plan-Do-Study-Act (PDSA) cycle for rapid feedback and process improvement within a complex adaptive systems model. The complex adaptive system allows for a continuous feedback loop from service, community partners, screening/intake, and implementation processes in the model to be analyzed for process improvement. Rather than focusing on cause and effect, the model recognizes the complexity of interrelationships in the RBHI model.

Figure 2. Richmond Brain Health Initiative Development Process