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Congregate Meals: Opportunities to help vulnerable older adults achieve diet and physical activity recommendations

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Abstract

Background: Through diet and exercise interventions, community centers offer an opportunity to address health-related issues for some of the oldest, most vulnerable members of our society.

Objectives: The purpose of this investigation is to draw upon nationwide data to better characterize the population served by the congregate meals program and to gather more detailed information on a local level to identify opportunities for service enhancement to improve the health and well-being of older adults.

Design: We examined community center data from two sources: 2015 National Survey of Older Americans Act and surveys from two New York City community centers. To assess nationwide service delivery, we analyzed participant demographics, functional status defined by activities of daily living, and perceptions of services received.

Measurements: Participants from the two New York City community centers completed a four-day food record. Functional measures included the short physical performance battery, self-reported physical function, grip strength, and the Montreal Cognitive Assessment.

Results: Nationwide (n=901), most participants rated the meal quality as good to excellent (91.7%), and would recommend the congregate meals program to a friend (96.0%). Local level data (n=22) were collected for an in-depth understanding of diet, physical activity patterns, body weight, and objective functional status measures. Diets of this small, local convenience sample were higher in fat, cholesterol, and sodium, and lower in calcium, magnesium, and fiber than recommended by current United States Dietary Guidelines. Average time engaged in moderate physical activity was 254 minutes per week (SD=227), exceeding the recommended 150 minutes

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per week, but just 41% (n=9) and 50% (n=11) of participants engaged in strength or balance exercises, respectively.

Conclusion: Research is warranted to test whether improvements in the nutritional quality of food served and access/supports for engaging in strength training within community centers could help older adults achieve diet and physical activity recommendations.

Keywords

aging; diet quality; cognitive function; physical function

Introduction

The number of Americans aged 65 years and older is projected to double from 49.1 million in 2016 to ~100 million by 2060 (1). The Older Americans Act (OAA) Title III, federal legislation first passed in 1965, established a grant system to fund programs such as congregate meals for adults aged 60 and over. Congregate meal services operate in all 50 states through over 5,000 providers. As part of the program, data are collected on demographics, functional status defined by activities of daily living (ADLs), and perceptions of services received. However, there are few data that address the efficacy of the program (2) or describe potential opportunities for enhancement of services. Prior local level studies have focused on factors associated with food insecurity (3, 4), dietary intake (5, 6), physical activity (7), and the built environment (8, 9). National studies have included commentaries on the perceived impact of the program (2, 10).

Community centers represent an opportunity to help older adults meet dietary recommendations and offer opportunities to engage in physical activity. The first large-scale diet and physical activity intervention trial among older adults recently demonstrated improved adherence to national dietary guidelines and delayed cognitive decline of a Finnish population (11). A multi-component intervention conducted in the United States testing a diet consistent with the US Dietary Guidelines, the Dietary Approaches to Stop Hypertension (DASH) diet, improved cognitive performance among adults (mean age 52, standard deviation 10 years) with prehypertension or stage-1 hypertension (12). The purpose of this investigation is to draw upon nationwide data to better characterize the population served by this program, and to gather more detailed information on a local level to identify opportunities for service enhancement to improve the health and well-being of older adults.

Methods

To obtain a nationally representative sample, we summarized the most recent data release (2015) of the National Survey of Older Americans Act, a telephone survey that has been conducted annually since 2005. The weighting scheme samples Department of Health and Human Services-funded Area Agencies on Aging. Within selected programs, a sample of clients for each service is surveyed. Services include the Home Delivered Meal Program, Homemaker Services, Transportation, Family Caregiver Support Program, Congregate Meals, and Case Management (13).

To obtain more detailed information on nutrition, physical activity, and functional status to inform intervention designs, we recruited a convenience sample of English-speaking adults over age 65 from two senior centers in New York City. We posted recruitment flyers in each senior center near the main dining areas with study details and contact information. Study staff provided additional announcements during lunchtime. At the first visit, participants were instructed to complete a four-day food record, including at least one weekend day. During the second visit, the food record was reviewed with a nutritionist and clarifications were noted on the form. We measured physical function via the validated RAND-36 (14) and objectively using the Short Physical Performance Battery, comprised of balance, gait, and lower extremity strength components (15). We measured grip strength using a Jamar hand-held dynamometer (Lafayette, IN) in the dominant arm for two trials. We measured cognitive performance using the Montreal Cognitive Assessment (MoCA)(16).

Food records were analyzed using Nutrition Data System for Research (NDSR 2016) (Nutrition Coordinating Center, University of Minnesota, MN)(17) Diet quality was assessed using a DASH score (18) comprised of nine components (total fat, saturated fat, protein, cholesterol, potassium, calcium, magnesium, sodium, and dietary fiber) that was adapted to accommodate the higher protein content of the OMNI-Heart protein-rich diet (25% of energy) to reflect the growing evidence suggesting protein needs are greater among older adults.(19, 20) Descriptive statistics were used to characterize participant demographics (Table 1) and perceptions of services received (Table 2). Within the local sample, we further characterized diet (Table 3), and physical activity (Table 4),using mean and standard deviation for normally distributed nutrient density variables and median and inter-quartile range for physical activity variables as Shapiro Wilks results were $p < 0.05$. Data were analyzed using SAS (Version 9.4, SAS Institute, Cary, NC), and PROC SURVEYFREQ was used to account for the sampling design within the nationwide sample. The Institutional Review Board at New York University School of Medicine approved this study.

Results

National (US) Data

Two-fifths of participants were between 65 and 74 years old (40.8% in US, Table 1). Approximately two-thirds were female and the sample was racially/ethnically diverse (Table 1). Less than one-fifth of the US sample completed college, and two-fifths of the US sample were married.

Over half (58.2%) reported no limitations in ADL's (bathing, dressing, eating, transferring from bed to chair, or toileting) and just 16.2% reported 2 or more limitations. Participants rated the congregate meals program favorably. Most participants (91.7%) rated the overall quality of meals as good to excellent, and 96% would recommend the congregate meals program to a friend (Table 2). Almost three-quarters reported the meals improved their health (74.4%), four-fifths stated meals improved their diet (77.5%), and 81.5% stated meals helped them feel better.

Local New York City (NYC) Data

Less than one third of local NYC participants met any of the nutrient goals for the OMNI-Heart protein diet (Table 3). On average, saturated fat comprised 10% of energy compared to the recommended 6% of energy. Protein intake was 20.2% (SD=4.5%) of energy, which is lower than the 25% of energy target, and cholesterol intake was two times higher than the goal (145mg versus 71mg). Two-thirds (n=14) met the 2008 Physical Activity recommendation of engaging in 150 minutes per week of moderate physical activity (21). Less than half (n=9, 41%) engaged in strength exercises, and median frequency was less than the goal (0 versus 3 times per week, respectively)(22) (Table 4). Half (n=11, 50%) participated in activities that improve balance (e.g. yoga and tai chi) with an median frequency of one time per week, rather than the target of three times per week. Mean Body Mass Index (BMI) was 28.5 (SD=6.5), with over half categorized as overweight or obese (27.3% BMI 25-29.9 and 35.9% BMI 30+) (data not shown).

Discussion

The congregate meals program is consistently popular among participants, with 92% rating the meals as good to excellent, serving a vulnerable population that is projected to double in size over the next 40 years. Despite the potential value of this program, less than a third of participants met any of the nutrient goals for a healthful dietary pattern. Interventions to improve modifiable behaviors might help maintain independence and reduce health care costs. The scalability of successful interventions could be immediate. Because congregate meals represented half of participants' daily food intake on average, altering menus to reduce foods rich in saturated fat, cholesterol, and sodium while increasing foods rich in protein, calcium, fiber, magnesium, and potassium could help participants achieve dietary recommendations.

Among this sample residing in New York City, most participants met the physical activity recommendation of engaging in 150 minutes per week of moderate physical activity. However, congregate meals centers could serve as a focal point for increasing participation in strength and balance exercises, as these activities reduce the rate of mobility disability (23), and provide non-ambulatory older adults with opportunities to engage in activities that improve functional status.

This work draws upon nationally collected data to characterize the population served and better understand participant perceptions of the program while collecting more detailed nutrition and physical activity information at the local level to inform opportunities for enrichment of existing services that can translate into maintenance of independent living and reduced healthcare costs. Others have examined the diet quality of congregate meal participants on a national (24) and local (5, 6, 25) level. According to 24-hour recall data from 145 congregate meal participants nationwide, program participation was associated with an increase in daily intake of protein by 8 g, fiber by 3 g, calcium by 146 mg, magnesium by 45 mg, potassium by 317 mg, and sodium by 328mg (24). Further efforts to reduce the gap between dietary intake and recommendations would not require drastic intervention measures. For example, incorporating ½ cup of lentils into a meal would add 9 grams of protein, 8 grams of fiber, and 365mg of potassium, and using it as a replacement

for sausage would result in a net reduction of 11 grams of fat, 4g of saturated fat, 24 mg of cholesterol and 306 mg of sodium (26).

For the most part, the NYC sample engaged in adequate levels of aerobic activity. Though this was a small sample, the accuracy of these self-reports is supported by an accelerometry study reporting high levels of moderate to vigorous physical activity (MVPA) (39.3 minutes per day using 1,041 counts per minute to define MVPA) among 760 NYC residents aged 60 and older (7). Despite aerobic activity, few participated in strength and balance training. Randomized trials have demonstrated the value of strength and balance training on physical function among older adults (27), and large-scale trials are currently underway in Europe testing the effectiveness of multicomponent physical activity interventions (22, 28). Increasing strength and balance training in community centers might improve overall function and reduce falls.

This work underscores that the prevalence of obesity is high, even among active, older adults who remain socially engaged through activities in community centers. Over half of congregate meals participants in Georgia (53%, n=62) were obese (BMI \geq 30) (29), while obesity among congregate meals participants residing in New York City residents was 47% (n=467)(5) in Brooklyn and Queens and 36%(n=7) in this small Manhattan sample . Data from this study suggests intervening on the type of foods and activities offered at senior centers could increase the proportion of older adults meeting diet and physical activity recommendations. Furthermore, national survey data supports the popularity of a program that costs less than \$11 per meal,(30), and the local data identified opportunities for enhancing services at a local level.

This sample was limited to active participants of congregate meals programs, so we cannot generalize findings to the broader population of older adults. The convenience sampling strategy likely attracted a subset of senior center participants that were more interested in healthy eating and exercise, so future studies should build upon this work by engaging a more representative sample. As a cross-sectional study, we could not measure future benefits of program participation. A clinical trial could formally test the effectiveness of diet and physical activity interventions on functional status in a community based setting.

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Table 1.

Congregate Meals Participant Characteristics, National and Local Level

	US, n=901		NYC, n=22	
	Frequency	%*	N	%
Age				
60-64 years	64	5.3	1	4.6
65-74 years	326	40.8	16	72.7
75-84 years	328	35.0	5	22.7
85+ years	183	18.9	0	0.0
Gender				
Male	284	33.7	7	31.8
Female	617	66.2	15	68.2
Race				
White/Caucasian	718	75.9	10	45.5
Black/African-American	142	11.2	5	22.7
Asian	12	1.6	3	13.6
American Indian/Alaskan Native	21	1.7	4	18.2
Pacific Islander	2	0.1	0	0.0
Other	17	8.8	0	0.0
Don't know/Refused	5	0.7	0	0.0
Ethnicity				
Hispanic	44	12.9	5	22.7
Non-Hispanic	849	86.5	17	77.3
Don't know/Refused	8	0.6	0	0.0
Education Level				
<High school	148	16.6	4	18.2
High School Diploma/GED	311	32.6	4	18.2
Some College	278	32.7	3	13.6
College Degree	162	18.0	11	50.0
Refused	2	0.2	0	0.0
Marital Status				
Married	353	39.2	4	18.2
Widowed	363	39.0	6	27.3
Divorced	118	14.3	4	18.2
Separated	14	1.1	2	9.1
Never Married	48	5.9	6	27.3
Don't know/refused	5	0.5	0	0.0

* Weighted to account for the sampling design within the nationwide sample.

Table 2.

Participants' Functional Status and Perceptions of the Nationwide Congregate Meals Program

	Frequency	%*
Limitations in ADLs[†]		
0	499	58.2
1	230	25.7
2 or more	165	16.2
Overall rating of congregate meals		
Good to excellent	815	91.7
Fair or poor	85	8.3
Taste Satisfaction Rating		
Always	257	26.7
Usually	453	55.4
Sometimes	164	15.9
Seldom	18	1.4
Never	4	0.2
Don't know/refused	5	0.5
Variety Satisfaction Rating		
Always	333	38.2
Usually	363	39.9
Sometimes	183	18.6
Seldom	13	1.2
Never	6	0.5
Don't know/refused	3	1.8
Would recommend to a friend		
Yes	859	96.0
No	35	3.6
Don't know/refused	7	0.4
Meals improve health		
Yes	678	74.4
No	165	18.9
Don't know/refused	58	6.7
Meals improve diet		
Yes	706	77.5
No	180	21.3
Don't know/refused	15	1.1
Meals help to remain living in home		
Yes	580	58.1
No	295	37.4
Don't know/refused	26	4.5
Meals help to feel better		
Yes	741	81.5

	Frequency	%*
No	122	15.0
Don't know/refused	38	3.5
Last time received meal		
Within the last day	301	31.6
Within the last week	300	31.6
Within the last month	122	13.3
More than a month ago	178	23.5
Duration of Participation		
<=6 months	113	15.2
> 6 months to< 1 year	91	8.4
1 to <2 years	126	12.5
2 to 5 years	292	35.2
>5 years	274	28.3
Don't know/refused	5	0.3
Days per week		
<=1	270	35.7
2-4	438	46.3
5+	150	12.5
Don't know/refused	43	5.5
Proportion of foods meal represents		
<1/2	417	46.9
1/2	261	33.5
>1/2	201	17.3
Don't know/refused	22	2.2

* Weighted to account for the sampling design within the nationwide sample.

[†]ADL, Activity of Daily Living; Limitations defined as needing help from another person in bathing, dressing, eating, transferring from bed to chair, or toileting

Table 3.

Comparison of Diet Quality with OMNI-Heart Protein Diet (18, 31)

Nutrient	OMNI-Heart Goal	Actual, Mean \pm SD	% Meeting Target, n=22
Total Fat, %	27	31.6 \pm 6.1	32
Saturated, %	6	10.0 \pm 2.6	14
Protein, %	25	20.2 \pm 4.5	14
Cholesterol, mg/1000 kcal	71.4	145 \pm 51	14
Potassium, mg/1000 kcal	2238	1733 \pm 372	22
Calcium, mg/1000 kcal	590	457 \pm 193	22
Magnesium, mg/1000 kcal	238	205 \pm 68	22
Sodium, mg/1000 kcal	1143	1385 \pm 366	31
Dietary fiber, g/1000 kcal	14.8	13 \pm 4	28

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Table 4.

Comparison of Physical Activity with Evidence-Based Intervention Goals (22, 32)

Domain	Goal times/ week	Goal minutes/ week	Reported Activities	Actual Ever, n (%)	Actual times/ Week, median (IQR)	Actual minutes/ Week, median (IQR)
Cardiovascular, moderate intensity	5	30	Walk briskly for exercise, dancing, golf, tennis, skating, heavy housework/gardening, cycling, swimming/water exercises, aerobics, basketball/ soccer/racquetball	18 (82)	6.5 (2.8-9.3)	240 (45-435)
Walking, other			Walk leisurely, to do errands, or uphill	22 (100)	7.5 (4.8-11.0)	240 (165-435)
Strength	3	10	Light or moderate/heavy strength training; general conditioning exercises	9 (41)	0.0 (0.0-2.0)	0 (0-120)
Balance	3	10	Yoga, Tai Chi	11 (50)	1.0 (0.0-3.3)	30 (0-120)