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Dietary Intake of Adults with Serious Mental Illness

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Abstract

Objective: Suboptimal diet may be related to the high prevalence of obesity and cardiovascular disease (CVD) in persons with serious mental illnesses, but few studies have characterized dietary intake in this population.

Methods: Participants were 102 overweight/obese adults with serious mental illnesses who were being screened for a weight loss trial in psychiatric rehabilitation centers. Direct observation of participant meals was completed using a standardized measurement form.

Results: CVD risk factors were common: mean body mass index was 35.7 kg/m²; 30% had diabetes. Participants consumed 100% of caloric beverages served (7.2 oz/meal) but consumption was significantly less than served for fruits (difference of 0.12 cups/meal, $p=0.003$) and vegetables (0.14 cups/meal, $p=0.02$). The majority (56%) of meat consumed was high fat.

Conclusions and Implications for Practice: Interventions designed to improve dietary intake of persons with serious mental illnesses are needed to improve health in this population at high risk for CVD.

Keywords

dietary intake; serious mental illness; psychiatric rehabilitation centers; cardiovascular disease

Introduction

Poor dietary intake may be related to the high prevalence of obesity and cardiovascular disease (CVD) in persons with serious mental illnesses. Previous work estimates that the prevalence of obesity is 10–30% higher for people living with serious mental illnesses compared to the overall population (Allison, Fontaine et al., 1999; McElroy, Frye et al., 2002). Furthermore, CVD is largely responsible for a 20% shorter life expectancy (Colton & Manderscheid, 2006). Despite the importance of understanding dietary behaviors in persons with serious mental illnesses, few studies have characterized dietary intake. This brief report's aim was to determine the dietary intake in persons who attend psychiatric rehabilitation programs (PRPs) and consume meals prepared by the PRP.

Methods

Study Population

Participants were overweight or obese (body mass index (BMI) ≥ 25 kg/m²) adults with serious mental illnesses being screened for a NIMH-funded behavioral weight loss trial. This report describes the baseline dietary intake of persons attending PRPs before the intervention commenced. Height and weight were measured by study staff according to a standardized protocol. Diabetes was defined as fasting plasma glucose level ≥ 126 mg/dl, self-report of physician diagnosis, or use of diabetes medication. Hypertension was defined as average blood pressure of $\geq 140/90$ mmHg from three standardized readings over three weeks, self-report, or use of antihypertensive medication. The study was approved by the Johns Hopkins Medicine Institutional Review Board.

Dietary Assessment

Foods and beverages served and consumed were observed and recorded at the beginning and end of meals by direct observation. Trained data collectors observed meals from an unobtrusive distance using a standardized measurement form to observe 5 meals per participant. Inter-rater reliability was tested using 10 meals per data collector (Kappa statistic 0.70–1.0). The dietary assessment form captured the specific dietary components that researchers planned to target in the weight loss trial. Observers recorded the amounts of beverages, fruits and vegetables served and consumed and food preparation types. After the meal, the participant was asked where they obtained the previous day's non-site meals.

Statistical Analysis

Mean servings of beverages, fruits and vegetables were determined by averaging data from five meals. T-tests were used to determine statistically significant differences between the amount of beverage/food served and consumed. To quantify the specific types and preparation methods of foods, the proportion of participants consuming a specific food item was determined given that a participant was served something from the food group.

Results

Participants

For 102 participants in 3 PRPs, 491 meals were observed. Mean age was 47 years; 58% were male and 42% were white. CVD risk factors were common. Mean BMI was 35.7 kg/m² and 71% were obese. Additionally, 54% had hypertension and 30% had diabetes.

Beverage, Fruit, and Vegetable Consumption

Caloric beverages were the majority of all beverages served and participants consumed 100% of them (Table 1). Commonly consumed beverages were milk and fruit juices. On average, less than half a cup of fruit was served and consumption was significantly less than served (0.32 cups, $p=0.003$). Similarly, about two-thirds cup of vegetables were served but, consumption was just over one-half cup ($p=0.021$). Most vegetables served were non-starchy (e.g., leafy greens) and very few meals contained beans/legumes.

Food Preparation Methods and Availability

Among participants who were served meat, the meats consumed were mostly (56%) high in fat (Table 2). When vegetables were served 20% were not consumed. In general, few fried vegetables were consumed (8%) but half of the vegetables served at breakfast were fried and all consisted of white potatoes. Most (51%) of the consumed fruit was canned in juice but 22% of participants did not consume all of the fruit served. Overall, no skim milk was served and low-fat (1%) milk was consumed most (44%) of the time. White bread was most commonly consumed (55%) and no whole grain bread was offered. Twenty-two percent of cereals consumed were high sugar (10g sugar/serving).

Additional Calories

After the meal, 36% of participants selected a snack. When snacks were purchased, they were consumed immediately. Few (6%) participants selected second servings but, if a second serving was selected, all of the food selected was consumed. Among participants that reported eating off-site the previous day, most ate at home (90%) and 8% reported eating at a fast food restaurant.

Discussion

Study participants had sub-optimal dietary patterns; and almost three times higher prevalence of diabetes and nearly two times higher prevalence of hypertension than in the overall population (2009). Although this report includes only individuals with overweight/obesity, more were obese than the U.S. population (71% vs. 33%) (Ogden, Fryar et al., 2004).

People living with serious mental illnesses need strategies to choose healthful foods in a variety of settings. We assume that food consumption patterns observed in this sample are similar to that of other institutional settings, where food choices can be limited. Previous work in an experimental setting indicates that individuals consume 100% of what is served (Wansink, Painter et al., 2005) and that portion sizes exceed Federal standards (Young &

Nestle, 2002). Therefore, improving meal quality and dietary education could have significant positive effects on the health status of this group of individuals. The implications of this report directly align with the Substance Abuse and Mental Health Services Administration's Wellness Vision and Pledge to increase life expectancy in persons with serious mental illnesses (2010).

It is important to note the low consumption of fruits/vegetables, and the presence of snacking behaviors at PRPs. Even if participants consumed similar quantities of fruits/vegetables at two other meals during the day, they would fall short of meeting recommendations (United States Department of Agriculture, 2006). Additionally, excess calories from non-nutritive snacks are problematic. Similar to people without serious mental illnesses, persons with serious mental illnesses may have a **strong** desire to obtain pleasure from eating and snacking. These desires may be augmented by anti-psychotic medications that can increase appetite and by having fewer other enjoyable experiences (e.g., social relationships, rewarding careers) (Kluge, Schuld et al., 2007).

This study has several strengths. First, data collectors directly observed dietary consumption instead of using self-report. Second, the five meals observed for most participants should be sufficient to describe diet (Basiotis, Welsh et al., 1987). Third, several dimensions of diet were captured at PRP meals and snack times. Nevertheless, data collectors only observed participants on-site, thus, it is unknown what foods were consumed away from the PRP.

Given the high risk of CVD, obesity and diabetes in persons with serious mental illness, understanding dietary intake in this population is important. The sub-optimal dietary patterns provide opportunities to modify the food environment in PRPs in efforts to improve the health of this population.

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MEAN (SD) OF BEVERAGES, FRUITS AND VEGETABLES SERVED AND QUANTITY CONSUMED/MEAL ($n=491$) AMONG ADULTS WITH SERIOUS MENTAL ILLNESS AT PSYCHIATRIC REHABILITATION PROGRAMS ($n=102$)

TABLE 1-

	Average Quantities per Meal			
	Served	Consumed	Difference (Served-Consumed)	p-value
Beverages (fl. oz.)				
All ¹	10.2 (6.1)	8.4 (5.3)	1.7 (2.9)	0.029
Sugar-sweetened ²	2.8 (2.3)	2.8 (2.3)	0 (0)	1.00
Milk	4.4 (5.1)	4.4 (5.1)	0 (0)	1.00
Fruit (cups)	0.44 (0.31)	0.32 (0.26)	0.12 (0.20)	0.003
Vegetables (cups)				
All	0.66 (0.38)	0.54 (0.36)	0.14 (0.34)	0.021
Starchy	0.11 (0.15)	0.09 (0.13)	0.02 (0.06)	0.299
Non-starchy	0.51 (0.34)	0.42 (0.32)	0.09 (0.13)	0.055
Beans/legumes	0.03 (0.07)	0.02 (0.06)	0.01 (0.04)	0.290

¹ All: includes sugared beverages, milk, coffee, water, diet soda

² Sugar-sweetened beverages: includes juice, regular soda

TABLE 2-

THE DISTRIBUTION OF SPECIFIC FOODS CONSUMED BY ADULTS WITH SERIOUS MENTAL ILLNESS AT PSYCHIATRIC REHABILITATION PROGRAMS (n=102)

Food Category and Preparation Method	Proportion of Food Item Consumed [% (SD)] ¹		
	Total (n=102)	Breakfast (n=37)	Lunch (n=90)
Meat			
High fat	56.3 (42.3)	51.3 (30.7)	56.6 (44.9)
Chicken breast	15.9 (35.0)	0 (0)	16.4 (35.4)
Deli turkey or ham	9.6 (26.7)	0 (0)	10.3 (28.3)
Fish/shellfish	2.8 (14.0)	0 (0)	2.7 (13.6)
Ground turkey	0.5 (3.1)	0 (0)	0.8 (5.0)
Eggs	4.6 (13.8)	39.8 (27.3)	2.8 (15.9)
Not consumed	7.4 (11.7)	9.0 (15.6)	6.9 (13.7)
Vegetable			
Fried	7.9 (19.4)	50.0 (54.8) ²	7.2 (18.9)
Not fried	70.2 (29.8)	50.0 (54.7)	69.4 (30.6)
Not consumed	19.7 (22.8)	0 (0)	20.6 (24.1)
Fruit			
In syrup	6.3 (16.9)	0 (0)	7.6 (18.4)
In juice	51.0 (38.0)	3.3 (18.2)	63.8 (36.0)
Fresh	22.0 (32.7)	64.7 (44.6)	9.5 (19.3)
Not consumed	21.5 (30.0)	31.9 (43.3)	17.2 (29.1)
Milk			
Whole	0.9 (5.8)	0 (0)	2.9 (16.1)
2%	39.7 (41.1)	37.9 (45.2)	35.6 (40.0)
1%	44.4 (40.7)	54.8 (44.0)	44.0 (41.9)
Skim	0 (0)	0 (0)	0 (0)
Not consumed	12.9 (27.9)	6.6 (20.1)	15.1 (30.6)

Food Category and Preparation Method	Proportion of Food Item Consumed [% (SD)] ¹		
	Total (n=102)	Breakfast (n=37)	Lunch (n=90)
Bread			
White	54.9 (33.2)	58.6 (36.8)	52.4 (35.3)
Wheat	33.1 (31.8)	34.1 (38.1)	30.9 (32.2)
Whole Grain	0.5 (5.0)	0 (0)	0.5 (5)
Not consumed	12.6 (19.2)	7.6 (21.2)	15.3 (22.6)
Cereal			
High sugar	-	22.2 (28.4)	-
Low-sugar	-	67.9 (31.4)	-
Not consumed	-	9.5 (25.6)	-
Snack (% eaten, n=37)	100.0 (0)	-	-
Extra Food (% eaten, n=6)			
Extra Food (% eaten, n=6)	100.0 (0)	-	-
Non-site Meals			
Fast-food restaurant	8.3 (14.4)	-	-
Sit-down restaurant	1.1 (4.3)	-	-
Home	90.6 (14.9)	-	-

¹ Proportion of individuals that consumed a specific food item among those that selected a food from the respective food group

² n=6