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Effects of lunch club attendance on the dietary intake of older adults in the UK: A pilot cross-sectional study

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Abstract

Background: Lunch clubs are community-based projects where meals are offered with opportunities for social interaction, and a unique dining experience of dual commercial and communal nature. **Aim:** The aim of the present cross-sectional study was to assess differences in the dietary intake between lunch club and non-lunch club days among community-dwelling elderly, living in Dorset, UK. **Methods:** A total of 39 elderly individuals attending local lunch clubs were recruited. Socioeconomic factors were recorded, anthropometric measurements were taken and the dietary intake was assessed in lunch club and non-lunch club days via 24 hour dietary recalls. **Results:** For the majority of participants, having a hot meal (74.4%), meeting with friends (92.3%), dining outside home (76.9%), having a home-styled cooked meal (71.8%) and skipping cooking (43.6%) were considered as important factors for lunch club dining. Absolute energy intake, protein, fat, carbohydrate, saturated fatty acids, fibre, potassium, calcium, iron, vitamins A, C and folate and water from drinks were significantly greater on lunch club days. When intake was expressed as a percentage of the dietary reference values, all examined nutrients were consumed in greater adequacy during lunch club days, except potassium and vitamin D. **Conclusions:** Lunch clubs appear to be an effective means for ameliorating nutrient intake among older adults, while in parallel, offer the opportunity for socializing and sharing a hot meal with peers.

Keywords

Dietary survey, older people, ageing, social dining, community meals, cooked hot meal

Introduction

During the last decades, the elderly population has grown faster than any other age group (Stokes and Preston, 2013). With increased morbidity characterizing older age (Kingston et al., 2018; Shlisky et al., 2017), this substantial increase in longevity is hallmarked by a need to promote healthier ageing (Grammatikopoulou et al., 2019; Marsman et al., 2018). On the other hand, nutritional status, and in particular malnutrition, appears to be a pivotal health effector among the elderly, triggering the development of several health issues (Shlisky et al., 2017), while in parallel, increasing mortality risk.

A high proportion of elderly individuals are malnourished (Grammatikopoulou et al., 2019), mainly as a result of altered nutritional needs, decreased appetite, chewing problems, sensory decline, food insecurity, social isolation and poor psychological health (Agarwal et al., 2013; Clegg and Williams, 2018; Feldblum et al., 2007; Grammatikopoulou et al., 2012). Therefore, developing effective interventions to tackle malnutrition among older adults is an important public health priority. Community-based projects such as lunch clubs are a fairly recent approach in the UK and other countries (Brunet, 1987). Lunch clubs are community places where meals are offered in a social setting such as a day centre, or a village hall. They are delivered by community, faith or charitable groups, meeting on average once a week and recruiting participants via word of mouth, advertising or referral from

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health and social care professionals. Apart from a healthy meal, lunch clubs also offer opportunities for social interaction, and a unique dining experience of dual commercial and communal nature (Thomas and Emond, 2017).

Lunch clubs can allow commnesality and in this way the psychology of the elderly and their feelings of happiness can be improved (Yiengprugsawan et al., 2015; Thomas and Emond, 2017); however we lack data concerning the effects of luch clubs on dietary intake of older adults. Limited research suggests that regular attendance of lunch clubs can increase compliance with the recommendations for key nutrient intake, including calcium, iron, folate and vitamin D (Burke et al., 2011). Given that elderly malnutrition is also associated with lower income tiers (Donini et al., 2013), lunch clubs could also serve as a means for improving dietary intake. Based on this hypothesis, the present pilot cross-sectional study was designed, aiming to compare dietary intake between lunch club and non-lunch club days, among elderly people in the UK.

Methods

The present cross-sectional study was carried out at lunch clubs in Dorset, UK, between November 2015 and January 2016. Lunch clubs with a target audience of attendees over 65 years old were approached with details of the study. Once agreed, a mutually convenient date was arranged for the researcher to visit on the day of a lunch. Five lunch clubs in total were visited in the Dorset area. Participants were recruited from these clubs on a convenience sampling basis, with the only criteria being (a) age greater than 65 years old; (b) attending a lunch club at least once per week; (c) being able to communicate effectively in the English language; and (d) willing to participate. In further detail, 10 older adults were recruited from Briantspuddle, 12 from Wareham Parish Hall, six from the United Reform Church, five from the Gateway Church and seven from the Church Knowle. A total of 40 participants were recruited, but the final sample included 39 elderly with complete data. All participants were provided with an information letter, a consent form and a questionnaire, making it clear that they could withdraw at any point. The study was approved by Bournemouth's University Ethics Committee, ethics checklist ID 11511. Written informed consent was obtained from all participants prior to participation. The study followed the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines for cross-sectional studies (Supplementary file).

The questionnaire was designed specifically for this project and standardized with pilot testing to be used in more than one location. It was piloted twice on three older adults who were willing to take part in the preliminary phase of the questionnaire's development. Subsequently, modifications were performed including transposing all responses into a Likert scale or closed-question tick boxes with an additional option for those opting for exclusion from the answer, for increased ease and accuracy. Questions included length and frequency of lunch club attendance, meal enjoyment, reasons for attending and participants' perceived influence of dining in the clubs on their dietary habits.

Anthropometric measurements included height, weight, waist circumference and hand grip strength. Due to the season (winter) and the variety of participants' mobility issues, it was safer to complete the weight and height measurements with shoes and one layer of top clothing on. Additionally, body mass index (BMI) was calculated and body fat, as a percentage of body weight, was estimated with the Lean et al. (1996) method.

Self-reported food intake was assessed using three 24 hour dietary recalls. This was taken on the day of the interview (including their breakfast, lunch club meal and what they anticipated eating for the rest of the day) and two recent days that they were not at a lunch club. Validity of self-reporting has been suggested to decrease with age (Ortiz-Andrellucchi et al., 2009) due to memory loss, impairments such as hearing difficulties, and with the overweight elderly tending towards under-reporting energy and unhealthy food (Cade and Hutchinson, 2015). In order to obtain as much accuracy as possible, several measures were taken. To aid dietary recall, the researcher led recovery of missed food items and preparation methods by providing assistance with writing, particularly in the case of hearing or sight problems. In further detail, a structured dietary recall was used to provide helpful prompts, in addition to visual aids, similar in size and shape to anticipated portions of a ruler, to better estimate solid foods. These props were consistent at all clubs and helped to refine estimations of portion sizes.

NetWisp version 4.0 dietary software (Tinuviel Software Ltd, UK) was used to analyse the 39 completed dietary recalls. Micronutrient intake was compared to the dietary reference values (DRVs) (Department of Health, 1991), while the energy and carbohydrate intake were compared to the estimated average requirements (EAR) (Scientific Advisory Committee on Nutrition, 2011, 2015) and water from drinks was based on the British Dietetic Association guidelines (British Dietetic Association, 2017).

Data is presented as means $\pm$ standard deviations (SD) for normally distributed variables or medians with their interquartile range (IQR) for non-normal variables and frequencies/percentages for categorical variables. Normality was assessed with the Shapiro-Wilk test. Independent t-tests assessed differences in age and anthropometric characteristics between the genders. Fisher's exact test was used to compare categorical variables. Differences in nutrient intake between lunch club and non-lunch club days were assessed with paired t-test or Wilcoxon signed rank tests when the assumption of normality was violated. Multivariable linear regression models tested the relationship among the difference (Δ) in nutrient intake between lunch club and non-lunch club days (dependent variables) and male sex, age (continuous) and being married (independent variables), and were adjusted for non-lunch club

Table 1. Participants' characteristics of older people attending lunch clubs (mean ± SD, or *n* and %).

	All (*N*=39)	Males (*n*=17)	Females (*n*=22)	Significance[a]
Age (years)	82.1 ± 8.2	81.1 ± 7.5	82.9 ± 8.8	0.504
Anthropometrics:				
Body weight (BW) (kg)	72.8 ± 13.8	79.5 ± 12.5	67.6 ± 12.6	0.006
Height (cm)	162.9 ± 9.9	171.2 ± 5.8	156.4 ± 7.2	<0.001
Body mass index (kg/m^2)	27.4 ± 4.3	27.2 ± 4.7	27.5 ± 4.1	0.836
Waist circumference (cm)	100.2 ± 12.7	104.6 ± 12.6	96.8 ± 12.1	0.057
Body fat (% BW)	44.6 ± 10.2	46.2 ± 11.1	43.3 ± 9.5	0.384
Hand grip strength (kg)	18.0 ± 6.4	22.9 ± 4.8	14.2 ± 4.6	<0.001
Marital status:				
Married	8 (20.5%)	5 (29.4%)	3 (13.6%)	0.261
Other (single/divorced/windowed)	31 (79.5%)	12 (70.6%)	19 (86.4%)	
Living arrangements:				
Alone	25 (64.1%)	9 (52.9%)	16 (72.7%)	0.314
With one or more adults[b]	14 (35.9%)	8 (47.1%)	6 (27.3%)	
Retirement status:				
Pension/savings/benefits	37 (94.9%)	15 (88.2%)	22 (100%)	0.184
Work income	2 (5.1%)	2 (11.8%)	0 (0%)	
Transportation means:				
By vehicle	25 (64.1%)	10 (58.8%)	15 (68.2%)	0.738
On foot	14 (35.9%)	7 (41.2%)	7 (31.8%)	
Residential proximity to the lunch club:				
Less than 1 mile	28 (71.8%)	13 (76.5%)	15 (68.2%)	0.725
More than 1 mile	11 (28.2%)	4 (23.5%)	7 (31.8%)	
Duration of attendance at lunch: club:				
Less than 1 year	6 (15.4%)	1 (5.9%)	5 (22.7%)	0.206
More than 1 year	33 (84.6%)	16 (94.1%)	17 (77.3%)	
Reasons for lunch club attendance:	Important	Neither	Unimportant	
To have a hot meal	29 (74.4%)	7 (17.9%)	3 (7.7%)	
To meet with friends	36 (92.3%)	3 (7.7%)	0 (0.0%)	
To dine outside home	30 (76.9%)	8 (20.5%)	1 (2.6%)	
For a home-styled cooked meal	28 (71.8%)	5 (12.8%)	6 (15.4%)	
To skip cooking at home	17 (43.6%)	16 (41.0%)	6 (15.4%)	
For an affordable meal	15 (38.5%)	19 (48.7%)	5 (12.8%)	
For the extra activities	6 (15.4%)	28 (71.8%)	5 (12.8%)	

BW: Body weight; SD: Standard deviation.
[a]Significance values refer to either independent t-tests or Fisher's exact test for continuous and categorical variables, respectively.
[b]One female individual was in warden-controlled housing.

days' nutrients (continuous) (regression to the mean) (Barnett et al., 2004). All analyses were conducted on SPSS version 23.0 (IBM, SPSS Inc., Chicago, IL, USA) and STATA 12.0 (Stata Corp., College Station, Texas, USA), and the significance level was set at α=0.05.

Results

The sample comprised 39 individuals with a mean age of 82.1 (SD 8.2) years, and no difference in the gender distribution (43.6% male; 56.4% female; P=0.423). Overall, participants were overweight (BMI 27.4; SD 4.3; kg/m^2), abdominally obese (waist circumference 100.2; SD 12.7; cm), with low hand-grip strength (18.0; SD 6.4; kg). Table 1 stresses the sample's characteristics and between-gender tests of differences. Men were taller and heavier than women (P=0.006 and P<0.001), and demonstrated a stronger hand grip strength (P<0.001); however, the two genders did not differ in BMI, waist circumference, or body fat (all P>0.05).

Reasons for lunch club attendance, proximity to the lunch clubs, attendance duration and means of transport to and from the clubs are also detailed in Table 1. The majority of participants reported that having a hot meal (74.4%), meeting with friends (92.3%), dining outside home (76.9%), having a home-styled cooked meal (71.8%) and skipping cooking (43.6%) were perceived as important factors in relation to their lunch club dining experience. Meal affordability and participating in the activities offered at the lunch clubs were not deemed as important factors

Table 2. Dietary intake of participants on the day of lunch club and non-lunch club days (mean ± SD, or median with respective IQR) (*N*=39).

	Absolute intakes			% DRV[a]		
	Lunch club day	Non-lunch club days	Significance	Lunch club day	Non-lunch club days	Significance[b]
Energy (kcal)	1,850.1 ± 4839	1,367.3 ± 5168	<0.001	83.2 (28.0)	62.7 (26.0)	<0.001
Protein (g)	77.6 ± 27.2	65.3 ± 26.6	0.023	148.4 (92.0)	132.0 ± 526	0.019
Protein (%)	17.0 ± 4.9	19.3 (7.0)	0.021			
Total fat (g)	67.0 (31.0)	57.6 ± 24.7	0.001			
Total fat (%)	37.2 ± 8.6	38.0 ± 10.0	0.702			
SFA (g)	26.0 (21.0)	23.3 ± 10.6	0.037			
Total Carbohydrate (g)	205.0 (80.0)	147.0 (87.0)	<0.001			
Total Carbohydrate (%)	47.4 ± 8.6	43.4 ± 10.6	0.065			
Dietary Fibre (g)	12.0 (6.0)	9.0 (9.0)	0.013	41.0 (21.0)	31.0 (36.0)	0.031
Na (mg)	2,252.0 (1,387.0)	1,966.0 (1,452.0)	0.089	141.0 (87.0)	124.0 (81.0)	0.11
K (mg)	2,783.0 (1,225.0)	1,995.0 (1,129.0)	<0.001	80.0 (35.0)	58.0 (27.0)	<0.001
Ca (mg)	909.0 ± 337.6	634.0 (353.0)	<0.001	129.7 ± 48.3	90.0 (50.0)	<0.001
Fe (mg)	8.9 (5.0)	8.0 (7.0)	0.028	102.0 (53.0)	90.0 (77.0)	0.026
Vitamin A (μg)	1185.0 (1438.0)	865.0 (960.0)	0.020	202.7 (290.0)	123.6 (153.0)	0.015
Vitamin D (μg)	1.8 (2.0)	1.1 (1.0)	0.130	18.0 (18.0)	11.0 (14.0)	0.133
Folate (μg)	235.0 (173.0)	172.0 (116.0)	0.003	117.0 (87.0)	86.0 (58.0)	0.003
Vitamin C (μg)	73.0 (70.0)	33.0 (43.0)	0.002	183.0 (177.0)	80.0 (95.0)	0.002
Water from drinks (ml)	970.0 (400.0)	850.0 (437.0)	0.003	57.8 (24.0)	52.5 (28.0)	0.005

BDA: British Dietetic Association; DRV: Dietary reference value; EAR: Estimated average requirements; IQR: Interquartile range; SD: Standard deviation; SFA: Saturated fatty acids.
[a]Based on either the EAR or BDA guidelines.
[b]Significance values refer either to paired t-tests or to the Wilcoxon signed rank test.

Table 3. Multivariable linear regression models[a] of the relationships among male sex, age, married status and the dietary intake difference between lunch club and non-lunch club days.

	Male sex	Age	Married
DV/IV	ß (95% CI), significance	ß (95% CI), significance	ß (95% CI), significance
Δ Energy intake (EI)	38.30 (−156.73 to 233.33), P=0.692	5.36 (−7.41 to 18.12), P=0.400	45.65 (−222.85 to 314.14), P=0.732
Δ Protein (g)	−4.34 (−22.74 to 14.07), P=0.635	−0.15 (−1.39 to 1.09), P=0.808	10.60 (−15.35 to 36.54), P=0.412
Δ Protein (%DRV)	−0.46 (−3.81 to 2.88), P=0.780	0.01 (−0.22 to 0.24), P=0.936	−2.35 (−6.96 to 2.28), P=0.310
Δ Total fat (g)	8.69 (−13.77 to 31.16), P=0.437	−0.82 (−2.37 to 0.74), P=0.292	−20.08 (−52.02 to 11.87), P=0.210
Δ Fat (%EI)	4.59 (−1.44 to 10.61), P=0.131	−0.01 (−0.41 to 0.39), P=0.953	−4.91 (−13.01 to 3.19), P=0.226
Δ SFA (g)	−0.11 (−10.62 to 10.39), P=0.983	−0.52 (−1.24 to 0.20), P=0.151	−8.39 (−22.80 to 6.02), P=0.245
Δ Carbohydrate (g)	−4.95 (−44.10 to 34.21), P=0.799	0.98 (−1.61 to 3.56), P=0.447	52.63 (−2.22 to 107.48), P=0.059
Δ Carbohydrate (%EI)	−4.65 (−10.27 to 0.97), P=0.102	0.11 (−0.26 to 0.49), P=0.540	9.26 (1.62 to 16.91), P=0.019

Δ denotes the difference in nutrient intakes between lunch club and non-lunch club days; ß denotes linear regression beta coefficient; CI: Confidence interval; DRV: Dietary reference value; DV/IV: Dependent/independent variables; EI: Energy intake; SFA: Saturated fatty acids.
[a]Multivariable linear regression models included differences in nutrient intakes as DV and IV were male sex, age (continuous) and being married, and were adjusted for non-lunch club days' nutrients (continuous).

among the elderly. The majority of participants had been attending lunch clubs for more than a year and had chosen lunch clubs at a distance less than a mile from their home (84.6% and 71.8% of participants respectively). Transportation to the lunch clubs was performed by vehicle for most of the elderly.

Table 2 compares the dietary intake of participants between lunch club and non-lunch club days. In terms of absolute energy intake, protein, fat, carbohydrate, saturated fatty acids (SFA), fibre, potassium, calcium, iron, vitamins A, C and folate and water from drinks were significantly greater among lunch club days. When intake was expressed as a percentage of the DRVs, all examined nutrients were consumed in greater adequacy during lunch club days, except for potassium and vitamin D.

Male sex, age and being married did not have a significant relationship with the difference (Δ) in energy, total protein and fat, or SFA, intake between lunch club and non-lunch club days in multivariable linear regression models (Table 3). However, it was observed that being married had a significant, positive relationship with Δ carbohydrate intake, expressed as a percentage of the total daily energy consumption (ß =9.26, 95% CI=1.62 to 16.91, P=0.019). When the models were repeated for the micronutrients intake, only age had a positive relationship with the Δ sodium intake (ß =74.78, 95% CI=3.43 to 146.12, P=0.040). Finally, being married had a positive relationship with the Δ %DRV water intake (ß =10.59, 95% CI=0.89 to 20.28, P=0.033).

Discussion

The present study reveals that the dietary intake of the elderly is substantially improved on the days when dining at lunch clubs. In particular, energy, and macronutrient intake, as well as the consumption of several micronutrients, is greater during the lunch club days compared with the non-lunch club days. Additionally, being married was associated with increased carbohydrate and water consumption on lunch club, compared to non-lunch club, days.

The positive effect of lunch clubs on improving dietary intake and quality in the elderly appears to stem from two main factors: improved psychology and ameliorated diet quality. Research has shown that dining with company increases both the intake of key nutrients and the appetites of those living alone (Conklin et al., 2014; Vesnaver and Keller, 2011). The community spirit, social support, social network and reduction in social isolation has recently been highlighted by older people as a pivotal factor in affecting diet quality (Bloom et al., 2016, 2017; McIntosh et al., 1989). In addition, the elderly perceive lunch clubs as an opportunity to reduce the feeling of loneliness (Thomas and Emond, 2017). In this context, lunch clubs have been shown to negate some of the psychological effects caused by social isolation, including depression, poor cognitive performance and low perceived health status (Thomas, 2015). In a qualitative study (Thomas and Emond, 2017), older people reported lunch club dining as an out-of-routine procedure, while dining in and alone as being the commonest everyday method of dining.

As far as diet quality is concerned, lunch clubs provide older people with regular shared meals, and a wider variety of food compared with their norm (Thomas and Emond, 2017). This previous finding may explain the increased dietary intakes and quality of nutrients that were noted amongst participants attending lunch clubs in this study. In addition, the elderly consider lunch club meals as appetizing, and perceive the experience as a 'treat' (Thomas and Emond, 2017).

In our study, there were no differences in dietary intake between age and gender on lunch club and non-lunch club days. However, it was observed that there was a significant increase in carbohydrate and fluid intake among the married elderly on lunch club days. Overall, literature indicates that being married is associated with increased dietary intake during older age (Horwath, 1989; McIntosh et al., 1989), while widowhood is associated with increased depressive symptoms and less enjoyment of meals, which may lead to reduced dietary intake and quality (Vesnaver et al., 2015, 2016). Thus, it is highly likely that the improved intake of the married elderly is further increased on lunch club days.

Caveats of the present research include its pilot nature, allowing for a relatively small, although homogenous, sample of participants. Additionally, the cross-sectional nature of the design does not allow for a prospective understanding of the effects of lunch club dining on the dietary intake and health of the elderly. Future research should aim to recruit more participants and evaluate the psychological status of the elderly, as well as compare the diet quality of lunch club meals compared with those eaten at home.

To summarize, the present pilot study shows that lunch club dining is associated with increased dietary intake and nutrient quality among older people. This finding is important for stakeholders and policy makers in supporting better dietary intake among community-dwelling older people.

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Author contributions

FT (corresponding author) conceived the idea, designed and supervised the study. MGG prepared the first draft of the manuscript, which was adapted by FT. RL collected all data, analysed the dietary data and drafted part of the methodology. KG performed all statistical analyses and drafted the results. JL and CC edited and revised study procedures. FT was responsible for the final content of the paper. All authors read and approved the final manuscript.

Availability of data

Due to the personal nature of the data, they will be available blind, upon request.

Ethical statement

All study procedures were approved by the ethics committee of Bournemouth University (Reference Id 1151).

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Supplemental material

Supplemental material for this article is available online.

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