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### Original Citation

Hoyle, Anne and Hazzledine, Julie (2004) The dietary patterns of people with a mental illness who live in the community. *Mental Health and Learning Disabilities Research and Practice*, 1 (1). pp. 15-27. ISSN 1743-6885

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# The dietary patterns of people with a mental illness who live in the community

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# The dietary patterns of people with a mental illness who live in the community

Anne Hoyle & Julie Hazzledine

## Abstract

**Background:** People with mental health problems are known to have nutritional and physical health risks. This is due to the effect of mood on food intake, the side-effects of psychotropic medications, such as obesity and constipation, and the social issues affecting their food intake, such as poverty, homelessness and lack of motivation to shop for and cook food. Little is known about the actual dietary intake of this population. This study aimed to 1) establish the dietary patterns of a sample of community based mentally ill people, 2) compare their dietary patterns with the general population, 3) identify whether they follow the recommended healthy eating guidelines and 4) establish whether they are a group who require targeting for dietary education to prevent diet related health problems developing in the future.

**Method:** Twenty-two people with a mental illness, attending a local day centre, were weighed and questioned about their food intake, using a validated food frequency questionnaire.

**Results:** An analysis of the food frequency questionnaires demonstrated that the diets of mentally ill people differed little from the diets of the general population. Diets were generally low in fibre, due to a low intake of fruit and wholegrain foods, and high in saturated fat due to the frequent consumption of pies, pastries, chips and full fat milk (particularly by females). Refined sugar intake was primarily derived from sugar added to tea and coffee rather than sugared soft drinks or sugar containing foods. Over half of the subjects were overweight, smoked or exceeded the recommended level for alcohol intake.

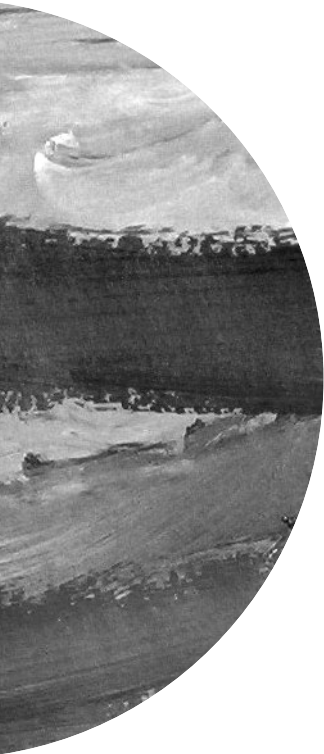
**Conclusion:** This study demonstrated that although the diets of our sample of mentally ill people were similar to those consumed by the general population, their diets did not meet the government's healthy eating recommendations, in order to prevent cardiovascular disease, diabetes, obesity and cancer. Our sample of mentally ill people was therefore predisposed to the same risks of disease as the general population. Dietary and healthy lifestyle education programmes are thus required and should be targeted at individuals in this population who are most nutritionally at risk. Unfortunately, we were unable to establish which individuals were most at nutritional risk due to the small sample size. Larger studies, which allow for sub grouping according to diagnosis and psychotropic medication, are required in order to establish whether they have an effect on dietary intake patterns.

**Key Words:** Diet, Patterns, Food, Intake, Nutrition, Mental Illness

## Introduction

People suffering from a mental illness are known to be at risk of poor nutritional status. There are several reasons for this. Firstly, psychiatric illnesses, including schizophrenia, mood disorders, eating disorders and substance abuse are known to adversely affect food intake, body weight and nutritional status (Gray, 1989). Secondly, drugs used to treat such disorders have effects on appetite and gastrointestinal function and interact with food and nutrients (Gray, 1989). Thirdly, social issues, such as poverty, homelessness and social isolation alter eating patterns, reduce food choice, and motivation to shop for, cook and eat food (Gelberg & Linn, 1988; Acheson, 1998).

Opportunistic eating, where people eat what they can get when it is available, is a way of life for many mentally ill people, and for others, chaotic eating is a part of a chaotic lifestyle (Evans & Dowler, 1999). Such poor eating patterns could lead to inappropriate food choices and the consumption of unhealthy diets. The physical consequences of such diets, for example, the development of cardiovascular disease,



obesity, diabetes and cancer, are well known (WHO, 1990). The greater prevalence of morbidity and mortality documented in people with a mental illness is therefore not surprising (DoH, 1993a). Cardiovascular disorders are common in people with schizophrenia and their standard mortality ratio for all illnesses is two and a half times greater than the general population (Clinical Standards Advisory Group, 1995). The National Service Framework for Mental Health (DoH, 1999) has therefore prioritised health promotion in order to tackle this inequality in health.

Despite this link between diet and health, few studies have assessed the dietary intake of mentally ill people, and most of these have been performed in the elderly population due to their increased risk of malnutrition (Sindler et al, 1996; Gilbride et al, 1998). The nutritional intake of homeless and marginalised people attending day centres in London (which include the mentally ill) was recently determined (Evans & Dowler, 1999). Dietary intake patterns were found to be poorer than social classes IV and V, and nutritional intakes were found to be insufficient to meet the current dietary recommendations for many vitamins and minerals. Homeless adults with a previous psychiatric hospitalisation have also been reported to have the worst physical health of all homeless people studied (Gelberg & Linn, 1988).

Thomas (1990) examined the dietary intake of mentally ill adults living in different types of accommodation. However, only 37% of these were living in their own homes or with a relative. The remainder lived in care homes where food was provided, which had a positive influence on nutritional intake. Of the people living alone, only 60% ate three meals a day and Vitamin C intakes were 40% below the recommended amount due to the low consumption of fruit. This study however focussed mainly on nutrient intakes rather than dietary patterns and was performed in the South of England, where dietary intake is known to differ from that in the North (Gregory et al, 1990).

The move to community care means that many people with an enduring mental illness who used to receive hospital meals now live in the community where they have to provide and cook their own food (DHSS, 1975). However, there have been no studies to date that have examined the dietary patterns of mentally ill adults living in the North of England community. This cross-sectional exploratory survey therefore aimed to investigate the food consumption patterns and food choices of a cluster of mentally ill adults attending a local community day centre. The objectives were to: establish whether their intake is different from the general population; determine whether this population is following the recommended healthy eating guidelines (WHO, 1990); and identify whether they are a group who require targeting for dietary education and intervention in order to prevent physical health problems developing in the future.

## Method

The target population was male and female mentally ill adults living in the community. The population studied was derived from individuals known to local Mental Health Services. From this study population, all individuals attending a day centre from 18 April to 28 August 2002 were selected for study. This cluster of people was required to meet the following selection criteria:

- Had a diagnosed Mental Health Disorder (ICD-10)(WHO, 1992).
- Had not experienced relapse in mental health condition, to the extent that they could not be interviewed.
- Had no severe memory problems (Dementia or Wernicke-Korsakoffs Syndrome) as this could have affected dietary recall.
- Were not following a prescribed therapeutic diet as this may have interfered with habitual dietary intake.
- Were not suffering from an eating disorder.
- Were aged between 18-65 years.

- Were not sectioned under the Mental Health Act (Buglass, 1993), due to ethical restrictions (DoH, 1993b).
- Were not of ethnic origin due to cultural differences in food intake and patterns of eating (e.g. fasting & religious restrictions).

All participants were provided with an information sheet detailing the purpose of the study and what the study would entail. Written consent was also obtained. Because both the dietitian and participant were not blind to the purpose of the study, these sheets were provided on the day of the interview, to avoid alteration of their usual food habits.

A nationally validated Food Frequency Questionnaire (FFQ) (Yarnell et al, 1983) was completed to establish patterns of food intake. Details of brand names and cooking methods were determined during the interview. Food portion size was determined using published standard food portion sizes (Crawley, 1988). Additional details were also requested including diagnosis, prescribed medications, living arrangements, cooking facilities, number of days lunch was eaten at the day centre, employment status and tobacco use. The frequency of the reported consumption of foods was compared with the reference figures for the general population obtained from The National Diet and Nutritional Survey: Adults aged 19 to 64 years (Henderson & Gregory, 2002).

The dietary interview was conducted at a local day centre on the participant's usual day of attendance in a relaxed, private setting. The date of the interview was unknown to the participant to avoid alteration of food intake the day prior to the interview. The same Dietitian (JH) performed all the dietary interviews in order to eliminate inter-observer error.

Dietary recalls considered incomplete or thought to be unreliable (e.g. due to memory problems) were excluded from analysis. People of an ethnic origin were excluded from the study

On the day of the dietary interview, the participant was also weighed (in light clothing) using portable Seca electronic scales (Manufacturer calibrated - Seca House, Birmingham) to the nearest 0.1 kg. Height was measured using a Seca stadiometer, to the nearest cm and Body Mass Index was calculated as weight (kg)/ Height (m<sup>2</sup>).

Due to the small sample size, descriptive statistics (mean, standard deviation and percentage) were used to compare the food intake patterns between the mentally ill sample and the general population (Henderson & Gregory, 2002).

The research proposal was submitted to the Ethics Committee at Dewsbury NHS Trust for approval. Permission to include patients in the study was also requested from the Consultant Psychiatrists.

A pilot study was performed by selecting five people attending the same local day centre, who met the selection criteria, to establish the variability of outcomes, test the interview procedure and identify problems in the methodology. No changes were required to the methodology following the pilot study.

## Results

### Sociodemographic characteristics

Twenty two subjects met the selection criteria and were approached to participate in the study. No subject expressed a wish to be excluded. All 22 food records were considered complete and reliable. Table 1 shows the socio demographic characteristics of the population studied.

Over half of mentally ill people living in the community lived alone, with more

males living alone than females. However, despite only cooking for themselves, most people had adequate cooking and food storage facilities at home. Over half of the sample smoked and just under half exceeded the recommended intake for alcohol. Only one person was vegetarian. The unemployment rate was extremely high with no subject being in employment at the time the study was performed.

**Table 1.** Sociodemographic characteristics, psychiatric diagnosis and medications prescribed for the sample.

	Male (n=14)	Female (n=8)	Combined (n=22)
<b>Age (years)</b>			
Mean $\pm$ standard deviation	40 $\pm$ 11.4	27- 59	37 $\pm$ 16.3
Range	18 - 64	39 $\pm$ 13.1	18 - 64
<b>Diagnosis % (n)</b>			
Schizophrenia	43 (6)	0 (0)	27 (6)
Bipolar	7 (1)	0 (0)	5 (1)
Depression	14 (2)	87 (7)	41 (9)
Depression with alcohol abuse	7 (1)	0 (0)	5 (1)
Anxiety	7 (1)	13 (1)	9 (2)
Personality disorder with affective component	14 (2)	0 (0)	9 (2)
Pre senile dementia	7 (1)	0 (0)	5 (1)
<b>Medication prescribed % (n)</b>			
Atypical antipsychotics	29 (4)	13 (1)	23 (5)
Typical antipsychotics	14 (2)	13 (1)	14 (3)
SSRIs	43 (6)	50 (4)	45 (10)
Tricyclics	7 (1)	13 (1)	9 (2)
Other antidepressants	29 (4)	13 (1)	23 (5)
Lithium	7 (1)	0 (0)	5 (1)
Hypnotics:			
Benzodiazepine	7 (1)	37 (3)	18 (4)
Non-benzodiazepine	21 (3)	37 (3)	27 (6)
Beta blockers	14 (2)	0 (0)	9 (2)
<b>Accommodation % (n)</b>			
Lives alone	64 (9)	38 (3)	55 (12)
Lives with partner	29 (4)	25 (2)	27 (6)
Lives with relatives	7 (1)	25 (2)	14 (3)
Supported accommodation	0 (0)	13 (1)	4 (1)
<b>Smokers % (n)</b>	57 (8)	63 (5)	59 (13)
Alcohol consumption > recommended amount % (n)	43 (6)	50 (4)	45 (10)
<b>Cooking facilities available % (n)</b>			
Cooker	100 (14)	100 (8)	100 (22)
Microwave	86 (12)	100 (8)	91 (20)
Fridge	93 (13)	100 (8)	96 (21)
<b>Number of days lunch taken at day centre per week</b>			
Mean $\pm$ standard deviation	2 $\pm$ 1.6	2 $\pm$ 0.7	2 $\pm$ 1.3

## Body weight

The sample appeared to be representative of the mentally ill population as mean BMI and percentage of people overweight were similar to those previously reported (Table 2). Surprisingly the prevalence of overweight in the sample was less than in the general population (Table 2). However, a third of participants reported weight gain in the 6 months prior to the interview.

**Table 2.** Body weight, body mass index (BMI) and self-reported weight change in the sample.

	Day Centre sample: Chronic mentally ill (aged 18-64)			General adult population		Chronic mentally ill population (aged 16-64)
	Male (n=14)	Female (n=8)	Both sexes (n=22)	Male	Female	Both sexes
<b>BMI†</b>						
Mean ± s.d	27 ± 5.1	26 ± 7.3	27 ± 5.8	25 <sup>†</sup>	28 <sup>†</sup>	27 <sup>*</sup>
Range	21 - 42	18 - 41	18 - 42			
<b>BMI &gt;25 ie overw't (%)</b>						
	57	50	55	68 <sup>‡</sup>	56 <sup>‡</sup>	55 <sup>*</sup> , 50 <sup>**</sup>
<b>Body weight</b>						
Mean ± s.d	89 ± 19.8	67 ± 16.8	81 ± 21.2	76 <sup>†</sup>	64 <sup>†</sup>	.a
Range	66 - 42	45 - 99	45 -142			
<b>Weight change in last 6 months% (n)</b>						
Gain	43 (6)	25 (2)	32 (7)	.a	.a	.a
Loss	21 (3)	50 (4)	36 (8)			
Stable	36 (5)	25 (2)	32 (7)			

-<sup>a</sup>data not available

<sup>‡</sup> DoH Health Survey for England (2001)

<sup>†</sup> Gregory et al 1990

<sup>\*</sup> Gopaldaswamy & Gordon (1985)

<sup>\*\*</sup>Thomas (1990)

## Dietary Patterns

### Fibre Intake

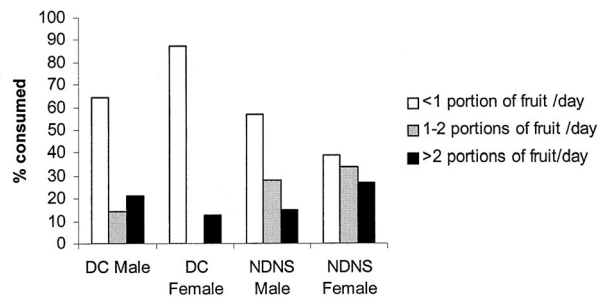
Eighty five percent of males and 63% of females consumed white bread. Females consumed a greater proportion of wholemeal bread than males (37% versus 15%). These trends were similar to those found in the general population (Henderson & Gregory, 2002).

A greater percentage of males ate breakfast cereal than females (91% versus 75%). Males had a slightly higher preference for low fibre cereals than high fibre cereals (50% versus 43%), whereas females were more likely to choose higher fibre than lower fibre ones (50% versus 38%). Again the figures are similar to those reported in the general population (Henderson & Gregory, 2002).

The average number of portions of fruit consumed per day was 0.8±0.9 portions for males and 0.9±1.0 portions for females. This is lower than reported in the National Diet and Nutrition Survey of 1.2 ±1.4 portions for males and 1.8 ±1.6 portions for

females living in the North of England. The percentage of mentally ill females eating more than 2 portions of fruit per day was also slightly lower than the mentally ill males and the regional average for females and males (Figure 1). Eighty eight percent of females ate less than one portion of fruit per day.

**Figure 1. Number of portions of fruit consumed**



DC = Day Centre sample  
 NDNS = National Diet and Nutrition Survey (Henderson & Gregory, 2002) figures for the Northern Region

The average number of portions of vegetable/salad consumed per day was  $1.5 \pm 0.9$  portions for males and  $1.4 \pm 0.5$  portions for females. This was similar to that reported in the National Diet and Nutrition Survey of  $1.3 \pm 0.9$  portions for males and  $1.3 \pm 0.9$  portions for females living in the North of England. The percentage of mentally ill people eating more than 2 portions of vegetable/salad per day (35.7% of males and 12.5% of females) was greater than the regional average (1% of males and 0% of females).

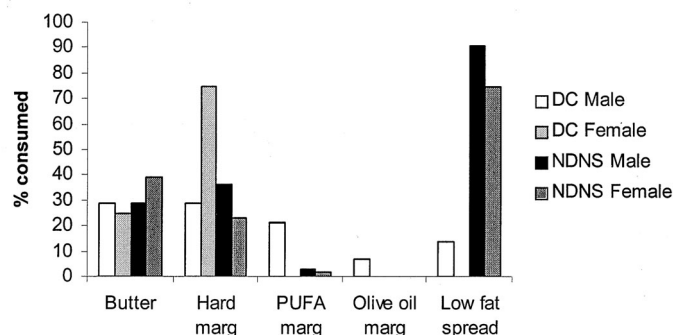
The average number of combined portions of fruit and vegetables/salad consumed per day was  $2.4 \pm 1.6$  portions for males and  $2.3 \pm 1.0$  portions for females, which was higher than the regional average of  $2.1 \pm 2.0$  portions for males and  $1.9 \pm 1.8$  portions for females. Only one male (this male was not the vegetarian) and no females met the recommended intake of 5 portions of fruit and vegetables/salad per day. This was below the regional figure of 13% for males and 15% for females (Henderson & Gregory, 2002).

The dietary intake of fibre from bread, breakfast cereals, fruit and vegetables/salad, was therefore low.

### Fat intake

Forty three percent of males and 100% of females used a spreading fat, which was high in saturated fat (butter and hard margarine). Only 14% of males and no females used low fat spreads, unlike the general population, in which over 70% consumed low fat spreads (Figure 2).

**Figure 2. Type of spread consumed**



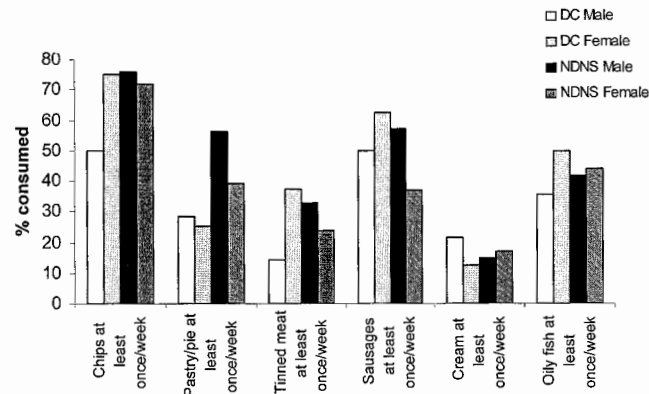
DC = Day Centre sample  
 NDNS = National Diet and Nutrition Survey (Henderson & Gregory, 2002) figures for the Northern Region  
 PUFA = Polyunsaturated fatty acids



All males and females used cooking oil for frying foods; hence, no participant used lard. A greater number of females than males ate fried foods more than twice a week (25% versus 14.%). Chips were eaten at least twice a week by 50% of females, but less so by males.

Other fatty foods that were commonly eaten (at least once a week) included sausages (55%) and pastry/pies (27%). The consumption of these fatty foods was less than the regional figures for males but higher than the regional figures for females for chips, sausages and tinned meat (Figure 3). Oily fish was eaten at least weekly by 41% of people, in line with the national intake of 43% (Henderson & Gregory, 2002).

**Figure 3. Frequency of the consumption of fatty foods**



DC = Day Centre sample  
 NDNS = National Diet and Nutrition Survey (Henderson & Gregory, 2002) figures for the Northern Region

Full fat milk was chosen in preference to semi-skimmed by females (50% versus 13%), whereas males consumed equal amounts of full fat and semi-skimmed milk (36%). Twenty one percent of males and 25% of females consumed skimmed milk, similar to the national intake of 21% for males and 26% for females (Henderson & Gregory, 2002).

The results therefore show that although the fat intake of the sample of mentally ill males was no greater (and in some cases less) than reported by the general population, the fat intake of the sample of mentally ill females was high and greater than reported in the general population.

### Sugar intake

Biscuits and chocolate were eaten daily by 27% and 18% of the sample respectively. Only 23% of participants drank sugared squash and fizzy drinks which was below the regional average of 75%. Nine percent drank sugar free varieties, which was also below the regional average of 46% (Henderson & Gregory, 2002).

Sixty four percent of males and 38% of females drank in excess of the recommended amount of caffeine intake per day (300mg/d), with 36% drinking more than 6 cups of tea or coffee per day. Seventy three percent of these drinks had sugar added to them, with males more likely to add sugar to their drinks (86%) than females (57%). The sugar intake of the sample was therefore high but similar for females to the regional figure for the general population (56%)(Henderson & Gregory, 2002).

## Discussion

### Body weight

Being overweight is a major health hazard. In 1983 the Royal College of Physicians called for public health measures to counteract the widespread and increasing problem of obesity in the community. It has been suggested that weight gain, obesity and the associated physical consequences are likely to be an even greater issue for people with mental health problems (Gopaldaswamy & Morgan, 1985). Furthermore,

the incidence of obesity has been reported to be escalating with the advent of the newer atypical antipsychotic medications, which have the common side-effect of considerable weight gain (Taylor & McAskill, 2000).

The results from this study showed that over half of our mentally ill participants were indeed overweight, similar to that reported in other psychiatric populations (Gopalaswamy & Gordon, 1985; Thomas 1990). However, surprisingly, the population studied had a prevalence for being overweight which was less than in the general population. This may be because only a third of the participants reported weight gain over the previous six months. It is therefore possible that many patients who are on antipsychotic medications gain weight (37% of our sample were receiving such medications), but others with different diagnoses, such as depression, or substance abuse, may have a tendency to lose weight (Gray, 1989). The finding that a third of participants reported weight loss in the previous six months would support this hypothesis. The dietary patterns and weight change of this sample are therefore likely to be affected by differences in diagnoses. Unfortunately, it was not possible to establish this effect (by sub-grouping these variables) due to the small sample size. It is therefore likely that only a sub set of the local population will require targeting for dietary education to manage obesity, whereas others who may be malnourished may require dietary education on a balanced diet.

## Dietary Patterns

### Fibre intake

The overall intake of fibre containing foods was low. This was in accordance with the findings of others (McCreadie et al, 1998; Evans & Dowler, 1999). Low fibre intakes are of particular concern due to the well-known side effect of constipation of many of the psychotropic medications with anticholinergic properties (Gray, 1989).

One reasons for the low fibre intake was the inadequate consumption of fruit and vegetables. A key feature of the Government's framework for reducing early deaths from coronary heart disease and cancer, and reducing health inequalities among the general population, is to improve access to, and increase the consumption of fruit and vegetables. The World Health Organisation (WHO, 1990) and the UK's Committee on Medical Aspects of Food (DoH, 1998) recommend eating at least five portions of fruit and vegetables a day. In this study only 7% of participants met this target, with 64% of men and 88% of women eating no fruit at all, with an average fruit and vegetable intake of only 2.4 portions a day. Other researchers have also reported low fruit and vegetable intakes in people with schizophrenia (Thomas, 1990; McCreadie et al 1998). As a consequence, the intake of the antioxidant vitamins A and C was likely to be low. This poor intake of fruit is of particular concern as a high proportion of our sample were smokers (59% compared to 32% in the general population; DoH, 2001) as smoking has been linked to higher lipid peroxide in people with schizophrenia and consequently higher risks of cardiovascular disease (Scottish Schizophrenia Research Group, 2000).

### Fat intake

Despite the current health promotion messages across the UK to reduce fat intake, our sample was found to have high saturated fat intakes. This was in accordance with the findings of Thomas (1990) and McCreadie et al (1998). However, the males in our sample consumed fewer foods high in saturated fat than males in the general population (Henderson & Gregory, 2002). This finding was supported by the Scottish Schizophrenia Research Group (2000) who noted cholesterol levels in people with schizophrenia to be similar to those in the general population.

These results were surprising for two reasons. Firstly, all our participants were unemployed and were therefore likely to have limited resources for purchasing healthy food. Secondly, a higher proportion of males than females lived alone yet their diets were lower in saturated fat. When the source of the fat intake was examined, fat intake was mainly derived from the consumption of foods containing 'hidden' fats rather than fried foods, although the frequent consumption of chips was a particular problem in females. This is not unexpected since women with limited income have been reported to have a higher consumption of these fatty foods

(Henderson & Gregory, 2002). It is also likely that the younger mean age in the female sample than the male sample may have skewed the data slightly towards their higher consumption of chips and sausages, as this trend has been reported in young female adults in the general population (Henderson & Gregory, 2002).

One explanation for why the diets of the mentally ill were no worse than the general population may be because participants attended the local day centre on average twice a week, where a three course balanced cooked meal was provided. Their dietary intake of healthy food could therefore have been boosted by the wide choice of food available at the day centre. The importance of day centres in the provision of cooked nutritious food for the mentally ill and homeless has previously been emphasised (Rushton & Wheeler, 1993; Evans & Dowler, 1999).

## Sugar intake

Many psychotropic medications have the side effect of thirst and carbohydrate craving, particularly antipsychotic drugs due to their anticholinergic properties and ability to block dopamine, serotonin and histamine receptor sites (Bernstein, 1984). Patients with drug-induced dry mouth tend to consume large quantities of fluid in an attempt to quench their thirst. Consumption of large volumes of caloric soft drinks as well as sweetened coffee and tea, can add considerably to the daily caloric intake leading to obesity (Kalucy, 1983). The same trend for a high fluid intake was found in this study where a third of participants drank more than 6 hot drinks a day and three quarters took sugar in these drinks. This trend was particularly evident in males. It is possible that the higher consumption of fluid by males could be explained by the greater percentage of males prescribed antipsychotic medications than females (41% versus 26%). The intake of soft drinks however was surprisingly low. No other study has measured the intake of beverages in the mentally ill population living in the community, so there was no reference data available for comparison. However, Holt (1997) reported similar findings in lithium-treated inpatients. It is possible therefore that only people taking thirst-promoting medications drink large quantities of tea, coffee and soft drinks, and a number of people in this study were not on such medications. One of the limitations of this study was therefore the small sample size as we were unable to group participants according to medication type and diagnosis in order to establish whether different psychotropic medications influenced drink intake to different degrees.

## Methodological problems

It is impossible to know precisely what free-living individuals eat. Dietary intake is inherently variable and no method can assess food intake without itself altering eating behaviour (Thomas, 2001). This study attempted to measure the dietary intake of mentally ill people using a FFQ. At the commencement of the study, we intended to cross-validate the FFQ with another method for measuring dietary intake, the 24 hour recall (Bingham, 1987; Bingham et al, 1988; Bingham et al, 1994) incorporating A Photographic Atlas of Food Portion Sizes (Nelson et al, 1997). However, during the course of this study, a publication in the *Journal of Human Nutrition & Dietetics* (Frobisher & Maxwell, 2003) concluded that the use of food photographs for estimating portion size along side a 24-hour recall was no longer a valid method for establishing energy and nutrient intake, particularly in populations where recall is a problem. Whilst we would not normally have changed the study design, based on the findings of one article, the authors of the paper were considered to have sufficient expertise in the field of dietary assessment techniques to accept their new findings. The 24-hour recalls performed were therefore not analysed in this study as originally intended in order to cross-validate the FFQ. The dilemma of whether to measure food intake in mentally ill people, at the risk of the data being invalid, or whether not to measure their intake at all, due to the pitfalls of dietary assessment, will remain. However, we felt that even if only trends and patterns of dietary intake could be determined, then this could be of some value. The results of this study must therefore be interpreted cautiously as FFQs can be inaccurate when used in small samples (Bingham, 1987). Nevertheless, the general agreement between the results of our study and those of other researchers who investigated the dietary patterns in mentally ill patients, indicate that our findings were likely to be valid.

## Conclusions

This study demonstrated that the diets of our sample of mentally ill people were similar to those consumed by the general population. However, their diets did not meet the government's healthy eating recommendations in order to prevent cardiovascular disease, diabetes, obesity and cancer. Over half the sample of mentally ill patients smoked, was overweight and exceeded the safe alcohol intake levels. Females had a particularly high intake of fat and males a high intake of sugar. Both sexes had low intakes of fruit.

The study therefore revealed a number of diet and lifestyle factors, which could predispose mentally ill people to the same risks of disease as the general population (WHO, 1990). It appears that dietary and healthy lifestyle education programmes are thus required. Ideally this education should be targeted at individuals in this population who are most nutritionally at risk.

## Recommendations

Assertive programmes to improve the diet are necessary in order to reduce the risk of heart disease, diabetes and cancer and to reduce the side effects of medication, such as obesity and constipation, in the mentally ill population. People with mental health problems have more contact with health professionals than the general public, so health professionals should not miss out on a useful opportunity for preventative work. In fact, even during this study, many of the subjects interviewed requested referral to a Dietitian for dietary advice on healthy eating, as they were keen to improve their diets. Education on correct dietary principles and the promotion of an active, healthy lifestyle have been found to be beneficial in this population (Merriman & Kench, 1993). It is likely that certain sub-groups are at greater risk of developing these physical complications than others, primarily those who gain weight as a side effect of their medication, those who smoke and young female adults with a high fat intake. Larger studies are required to determine whether diagnosis and type of prescribed psychotropic medication place some individuals at greater risk of poor dietary patterns. These potentially higher risk groups could then be identified and preferentially targeted for education. Healthy lifestyle programmes (called Meaningful Day) have recently been set up in many communities in order to manage drug-induced weight gain from the newer atypical antipsychotic medications. South West Yorkshire Mental Health Trust has already piloted such a programme and is currently planning to expand this research in to the inpatient unit at Fieldhead Hospital. The effectiveness of this new programme will be evaluated in due course.

From the dietary education aspect, it is recommended that the same key messages provided to the general population be also given to mentally ill people. However, it would be sensible to give these as four or five simple specific dietary changes rather than educate on the broad general principles of healthy eating due to the impaired cognitive abilities of some mentally ill people (Holt, 1997). Examples of these may include:

1. Replace biscuits with fruit
2. Cut down on the intake of pastry and chips
3. Choose semi-skimmed milk
4. Eat a high fibre breakfast cereal every morning
5. Avoid adding sugar to hot drinks, and replace soft drinks with diet varieties.

Day centres should continue to provide cooked nutritious meals. They may also wish to consider offering fruit to attendees mid-morning and mid-afternoon as an alternative to biscuits, where resources permit.

It is also recommended that larger studies be performed in the mentally ill population, using the FFQ, in order to provide further validity to the results found in this study.

# Acknowledgements

We wish to thank the men and women who took part in this study for their openness and acceptance of intrusion in to their lives. We would also like to thank Sue Sutcliffe (Day Services Manager) and John Butler (Co-ordinator of the local day centre) for help with recruitment of participants and use of the day centre premises. Thanks also go to the Clinical Governance Support Team at Fieldhead, for their research advice following the development of methodological problems.

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