

# Dietary intake of schizophrenic patients in Nithsdale, Scotland: case-control study

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BMJ 1998;317:784-5

The move to community care means that most schizophrenic patients now live outside hospital. Patients in the community are supported in various ways—for example, through drugs and nursing support. However, schizophrenic patients die early, especially from cardiovascular disease, which is promoted by an inappropriate diet.<sup>1</sup> Are schizophrenic patients making faulty dietary choices?

## Subjects, methods, and results

The study took place in Nithsdale, south west Scotland. It focused on schizophrenic patients living in accommodation provided by the Dumfries and Galloway Mental Health Association. Their position in the community had been assessed by social services as sufficiently precarious for them to need additional support. The residents, however, are encouraged to be responsible for their own domestic chores, including shopping and cooking. Each patient was matched with a normal control for sex, age, smoking status (smoker *v* non-smoker), and employment status—variables that affect a person's diet. All patients were unemployed.

Patients and controls were interviewed by a psychiatrist. The current average weekly food intake was obtained through a modified version of an established food frequency questionnaire.<sup>2</sup> Also recorded were patients' and controls' height and weight. Patients' mental state was examined using the positive and negative syndrome scale for schizophrenia. A blood sample was taken to measure serum concentrations of cholesterol and vitamin E.<sup>3</sup>

We studied 30 patients (17 men; mean age 44 (SD 15, range 20-79) years). Twenty three patients smoked. More patients (20) than controls (11) were overweight or obese, as assessed by body mass index (weight (kg)/height(m<sup>2</sup>)); McNemar's test,  $\chi^2 = 4.27$ ;  $P = 0.04$ ). The

patients consumed significantly less energy, total fibre, retinol, carotene, vitamin C, vitamin E, and alcohol (table). In all, 83% of the patients consumed less fibre, 71% of the male and 69% of the female patients consumed less vitamin E, and 70% of the patients and 73% of the controls consumed more energy from saturated fats than the suggested UK estimated average requirements (the amounts that any stated group of people will, on average, need).<sup>4</sup> The patients, when compared with the controls, consumed fewer fruit portions (median weekly intake 2.3 (range 0-20) *v* 7.0 (range 0-33); Wilcoxon matched pairs signed rank test, median difference 3.5 (95% confidence interval 0.5 to 7.5);  $P = 0.03$ ) and vegetable portions (10.0 (1-23) *v* 19.0 (4-34); 8.5 (4.0 to 12.0);  $P = 0.001$ ).

Fewer patients than controls (8 *v* 18; McNemar's test,  $\chi^2 = 6.7$ ;  $P = 0.01$ ) had a ratio of serum vitamin E concentration to cholesterol concentration of over 5 (said to be necessary to protect against cardiovascular disease).

Where dietary measurements in the patients differed significantly from those in the controls, correlations between these measurements and scores in the positive, negative, and total symptom scales were measured. In female patients, a positive correlation was found between positive symptoms and alcohol intake ( $\rho = 0.75$ ,  $P = 0.006$ ).

## Comment

Most patients smoked and were overweight or obese; their intake of saturated fat was higher than recommended; and antioxidant intake and ratios of serum vitamin E concentration to cholesterol concentration were low. These factors are associated with cardiovascular disease.<sup>1</sup> Patients on average consumed

Daily median (range) intake of various substances and estimated average requirements

Intake/day	Men		Women		All		Wilcoxon signed ranks test		Estimated average requirements	
	Patients (n=17)	Controls (n=17)	Patients (n=13)	Controls (n=13)	Patients (n=30)	Controls (n=30)	Median difference (95% CI)	P	Men	Women
Energy (MJ)	11.84 (7.67-17.93)	14.19 (6.94-23.22)	8.87 (5.07-13.02)	9.99 (5.25-16.25)	9.71 (5.07-17.94)	11.98 (5.25-23.22)	2.06 (0.26-4.23)	0.04	9.40*†	8.11*†
Protein (g)	92.5 (65.1-157.4)	114.2 (74-633)	68.7 (38.4-104.2)	82.5 (40.5-142.2)	84.5 (38.4-157.4)	96.0 (40.5-633.0)	15.9 (-1.1 to 32.8)	0.07	44.4‡	36.0‡
Total fibre (g)	13.0 (8.5-20.8)	22.0 (8.7-86.2)	10.7 (7.3-18.0)	15.5 (10.7-22.9)	12.6 (7.3-20.8)	18.9 (8.7-86.2)	7.0 (3.6 to 10.6)	0.0001	18‡	18‡
Retinol (µg)	647 (294-1498)	817 (134-12 341)	533 (288-7556)	817 (201-11 585)	590 (288-7556)	817 (134-12 341)	310 (93 to 1269)	0.02	500§	400§
Carotene (µg)	783 (219-3638)	2510 (523-11 313)	2048 (550-4657)	3079 (956-6188)	1443 (219-4657)	2798 (523-11 313)	1376 (549 to 2452)	0.004	—	—
Vitamin C (mg)	41.0 (4.0-204)	81.0 (14.0-262)	40.0 (3-165)	61.0 (27.0-291.0)	40.5 (3.0-204)	80.5 (14.0-219)	33.5 (2.0 to 64.0)	0.03	25§	25§
Vitamin E (mg)	4.8 (3.4-18.0)	10.26 (2.23-32.0)	4.5 (2.3-6.0)	5.38 (3.6-14.7)	4.7 (2.3-18.0)	7.8 (2.2-32.0)	2.9 (1.45 to 5.35)	0.0002	7†	5†
Alcohol (g)	3.8 (0-19.4)	11.7 (0-80)	0 (0-5.6)	1.8 (0-12)	0 (0-19.4)	5.7 (0-80)	5.4 (1.2 to 9.9)	0.009	—	—

\*Based on values in kilocalories (men 2250, women 1940). †Age 19-49 years. ‡Adults. §Age ≥15.

only 12 fruit and vegetable portions a week; the recommended intake is five portions a day.<sup>5</sup>

There was an association in female patients between mental state and alcohol intake. This association may have arisen by chance as, in all, 36 correlations were calculated. Also, association does not imply causality. Does a high alcohol intake worsen the mental state? Or does a disturbed mental state lead women to drink more?

We conclude that the schizophrenic patients we studied are making poor dietary choices. Assertive programmes to improve diet are necessary.

We thank the patients and staff of the Dumfries and Galloway Mental Health Association and the control subjects for their cooperation; Joan Brown, area dietician, for advice on dietary assessment and provision of training; Heather Barrington for statistical advice; and Mary Muirhead for secretarial help.

Contributors: RMcC initiated and coordinated the study, discussed core ideas, designed the protocol, participated in data analysis, and wrote the paper. JP initiated and coordinated the study, discussed core ideas, designed the protocol, participated

in data analysis, and edited the paper. EM discussed core ideas, participated in clinical data collection and data analysis, and contributed to the paper. DTS and JH discussed core ideas, participated in clinical data collection, and contributed to the paper. CB and DW discussed core ideas, analysed blood samples, and contributed to the paper. RMcC and JP are guarantors for the study.

Funding: None.

Conflict of interest: None.

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(Accepted 26 June 1998)

## Effect of fundholding on removing patients from general practitioners' lists: retrospective study

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Fundholding by general practitioners was introduced during NHS reforms in 1989. Little is known about its impact on the quality of patient care.<sup>1</sup> One measure of this impact is the rate at which practices decide they do not wish to continue to provide general medical services for patients and remove them from their lists ("removal at general practitioner's request"). In Northern Ireland the rate of the removing patients from practitioners' lists increased after the introduction of fundholding in 1993<sup>2</sup> which suggests that there is a relation between fundholding and removing patients from lists. We report an investigation to determine if becoming a fundholding practice changed the rates of removing patients from practice lists.

### Methods and results

For the past 15 years the Central Services Agency has maintained a register of all patients removed from lists at a general practitioner's request. The database does not contain patients who have been removed for reasons such as leaving the country or moving outside the practice area. However, records are retained if the patient has died or emigrated. Demographic data were obtained for each patient removed from a list during the study, and each record was coded according to the fundholding status of the practitioner.

There were four waves of fundholding between 1987 and 1996; the first began in April 1993 and each new wave followed in April of the succeeding year. The data were divided into three phases for each fundholding practice: fundholding, preparatory year (the financial year prior to fundholding), and prepreparatory period (from January 1987 until the start of the preparatory

year). The removal of an individual patient or family unit was counted as one decision, and only first time removals within the 10 year period were analysed. Rates for first removal decisions per 10 000 person years were calculated for each period as previously described.<sup>2</sup> Rates for non-fundholding practices were also examined using the commencement date of each wave of fundholding to artificially divide the data into before and after periods. In April 1996 there were 419 general practitioners in 114 practices serving 724 104 patients.

Results of the analysis are shown in the table. There was no increase in the rate of removing patients from non-fundholding practices. Among fundholding practices the rate of removing patients increased from 1.8/10 000 person years in the prepreparatory period to 2.2/10 000 person years during the fundholding period; this was an increase of 21.4% (95% confidence interval 7.4% to 35.5%) Practices that became fundholding practices in later years removed patients more frequently and started removing patients at higher rates during the preparatory year.

### Comment

The rates of removing patients from general practitioners' lists are influenced by characteristics of both the practice and population.<sup>2</sup> In this analysis practices were compared with their earlier performance obviating these potentially confounding variables. The increases in the rates among fundholders are therefore intrinsically related to fundholding status. The different rates of removal occurring between successive waves of fundholders and between fundholders and non-fundholders could be attributed to differences in socio-

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BMJ 1998;317:785-6