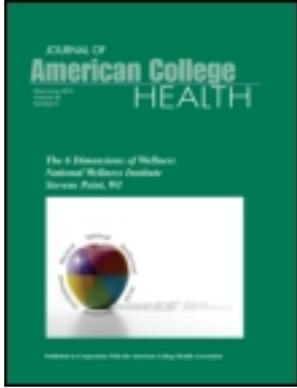


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The Effects of Economic Circumstances on British Students' Mental and Physical Health

Ron Roberts, PhD; John Golding, PhD; Tony Towell, PhD; Irene Weinreb, MBBS

Abstract. Three-hundred sixty British university students completed a questionnaire providing information on demographic characteristics, financial circumstances, smoking, and drug and alcohol use. A 14-item inventory of physical symptoms, the short form 36 health survey (SF-36), and the General Health Questionnaire (GHQ-12) were used to assess their physical and psychological well-being. Except for physical functioning, all subscales of the SF-36 and the GHQ indicated levels of health significantly below population norms matched for age and sex. Poorer mental health was related to longer working hours outside the university and difficulty in paying bills. Students who had considered abandoning study for financial reasons had poorer mental health, lower levels of social functioning and vitality, and poorer physical health as indicated by variables on the SF-36. They were also heavier smokers. Students' personal debt was significantly associated with their knowing people involved in prostitution, crime, or drug dealing to help support themselves financially.

Key Words: debt, finances, mental health, physical health, students

In recent years, the United Kingdom has witnessed a rapid expansion in the numbers of students enrolling in further, higher, and continuing education. Between the academic years 1990/91 and 1994/95, for example, numbers in full-time higher education increased 55%.¹ This expansion was most pronounced among women, whose numbers rose by 72%. An examination of undergraduate enrollment suggests that the forces responsible for the restructuring of the wider labor market toward more part-time, casual employment—chiefly of women in low-paid work²—have been similarly active in the arena of higher education.

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During the above-mentioned period, part-time undergraduate enrollments of women increased by 88%, compared with an increase of only 8.8% for men. Observers have been quick to point out that the expansion has not been matched by increases in real spending,¹ which for further, higher, and continuing education increased by only 17.4% during this time. One consequence of these changes has been a reduction in the value of the student grant, frozen for 4 years in the early 1990s, followed by reductions of 10% per year. The reduction in the value of the grant has been accompanied by increasing numbers of students taking out financial loans of various kinds.

A consequence of these changes is that large numbers of students are falling into debt and working increasingly longer hours in an attempt to maintain viable living standards. A recent estimate from the National Union of Students³ suggested that the average debt for final-year students was in the region of £4,800 pounds [more than \$US 7,600]. Lindsay and Paton-Saltzberg⁴ found 57% of their sample worked regularly during term time, with one third of those working more than of 20 hours each week.

Current trends suggest that these financial pressures on students are likely to grow, placing increasing numbers under stress and at risk of dropping out of higher education.⁵ Several studies^{6,7} have documented the role and the extent of financial problems in student life in the UK. The National Union of Students' 1994 survey⁶ found just over half of the sample (53%) reported being in debt at the time of the study. A number of smaller scale investigations lend support to these findings. Berry's⁸ study of 169 women attending a northern English university found more than 90% of the respondents unhappy with their financial resources, with a number expressing the possibility of dropping out of the university because of money difficulties. Rickinson and Rutherford,⁹ on the other hand, found severe

financial problems reported by only 18.5% of their sample, although they, too, found that such problems appeared to be connected to the risk of withdrawal from academic life.

International data paint a similar picture of students under financial strain. Tyrrell¹⁰ surveyed Irish undergraduate students and reported that financial problems (in addition to academic issues, time pressures, and interpersonal relationships) loomed large. Managing money was seen as the most important stressor among 1st-year students (reported by 44% as moderately or severely stressful). Similar figures have been reported from the United States, where 40% of Dunkel-Schetter and Lobel's¹¹ students described financial responsibilities as being often or very often overwhelming. Of 282 female students studied by Frazier and Schauben,¹² 60% indicated that they had experienced financial problems within the preceding 6 months.

Sands and Richardson¹³ found that low income was an obstacle to students' returning to their studies. However, low income was also a significant predictor of levels of depression, anxiety, and compulsivity in returning female students. Although estimates of the prevalence of financial difficulties from all of the above studies vary somewhat, given the diverse composition and locations of the student populations studied, these findings cannot be considered surprising.

All of the studies are consistent with the presence of financial problems in a large proportion of the student population. Whether these estimates will converge as sampling methods and location are standardized cannot yet be answered. Still another factor for consideration is how the solutions adopted by various countries for funding mass participation in higher education affect the prevalence of economic problems in student life.

The existence of financial difficulties in a particular population is of interest to health scientists and is relevant to health practitioners because a strong body of epidemiologic evidence points to associations between financial stress and ill health. These associations may be direct, arising from poor nutrition and bad housing, or they may be indirect, arising from the social meanings and implications of having relatively little money.¹⁴ Marmot et al¹⁵ found difficulty in paying bills was a major factor in explaining social class inequalities in depression and psychological well-being among British civil servants.

Although students' financial difficulties have been documented in a number of investigations, the possible direct and indirect (eg, through longer working hours) effects of money problems on health and psychological functioning have received little attention. Our current work, therefore, is intended as a preliminary examination of the relationships between students' economic circumstances, health behaviors, lifestyles, and mental and physical health.

METHOD

Participants and Design

We asked an opportunity sample of students from two universities in London, one old (established in the United

Kingdom before 1992) and one new (established after 1992 from existing polytechnics and institutions of higher education), to complete a survey questionnaire. The students provided information on demographic characteristics, financial circumstances, lifestyle (smoking, drug, and alcohol consumption), physical and psychological well-being (see the Appendix).

Respondents were predominantly from psychology and other science degree courses ($n = 267$, 74.1%) with the remainder from arts and humanities courses. We received completed questionnaires from 360 students (108 men, 252 women), for a response rate of 65%. Mean ages of respondents were 24.1 years ($SD = 5.2$ years) for men and 24.3 years ($SD = 6.2$) for women. The sample consisted of mainly undergraduate students ($n = 324$; 90%), and a majority (86.9%) were in full-time as opposed to part-time education.

Questionnaire Items

The standard UK version of the short-form-36 health survey (SF-36) was included in the questionnaire. We used 7 subscales: Physical Functioning, Social Functioning, Role Limitations due to Physical Problems, Role Limitations due to Emotional Problems, Vitality, Bodily Pain, and General Health Perceptions.¹⁶ Higher scores on these scales indicate better health.

We did not use a specific mental health scale in the SF-36 because the questionnaire also included the 12-item version of the General Health Questionnaire,¹⁷ which measures two aspects of psychiatric disturbance—the inability to carry out one's normal healthy functions and the appearance of new phenomena of a distressing nature. Higher scores on this scale are indicative of poorer mental health. To assess health in the 2 weeks before completion of the survey, the questionnaire also included an inventory of 14 different physical symptoms based on those used in the UK General Household Survey.¹⁸

We also assessed a range of health behaviors, including alcohol use (units of alcohol consumed during the preceding week), smoking (numbers of cigarettes smoked), and recreational drug use (we calculated a summary score on the basis of the number of different drugs used currently and since the beginning of academic studies). Further items inquired into the degree of difficulty experienced in paying bills, the number of hours worked in paid employment outside the university, and whether students had considered abandoning their courses for financial reasons. Also included were items that asked whether respondents knew of any students (men or women) who had engaged in drug dealing, prostitution, or crime to help support themselves financially.

Analysis

We calculated z scores for the 12-item GHQ and for each SF-36 dimension for each participant on the basis of norms established for people of the same sex and age group. Norms for the GHQ are based on data gathered from the Health and Lifestyle Survey,¹⁹ whereas those for the SF-36 come from the Jenkinson et al²⁰ community study in Oxford. To make

TABLE 1
Mean Scores and Sample Sizes for GHQ-12 and SF-36 Variables

Subscale	Sample <i>M</i>	Weighted <i>M</i>	Sample <i>SD</i>	<i>N</i>	Population <i>M</i>	% > 1 <i>SD</i> Below norms	% > 1 <i>SD</i> Above norms
Physical Functioning	90.92	88.86	15.43	353	88.40	9.7	0
Role Limitations—Physical	79.34	75.96*****	32.46	352	85.82	24.7	0
Bodily Pain	77.40	73.82*****	22.01	349	81.49	25.4	0
General Health Perceptions	65.54	66.63*****	20.74	347	73.52	24.9	6.4
Social Functioning	67.65	66.56*****	21.56	351	88.01	42.4	0
Role Limitations—Emotional	64.49	65.89*****	53.24	352	82.93	36.9	0.3
Vitality	53.14	52.61*****	25.22	350	61.13	30.7	9.5
GHQ	25.68	25.43*****	7.04	354	22.80	29.3	9.7

Note. GHQ-12 = General Health Questionnaire; SF-36 = short-form health questionnaire. Sample means are weighted according to age and sex distribution of the SF-36 population survey (Jenkinson et al²⁰) and Health and LifeStyle Survey (Cox et al¹⁹); population means are based on Jenkinson et al and Cox et al. Under the null hypothesis of no differences, 16% of a sample will fall beyond one *SD* of the mean of a population.
 ******p* < .0001.

TABLE 2
Summary of Regression Analyses, With All Models Adjusted for Age and Sex

Dependent variable	Independent variable	β	Adjustment for cigarette smoking
Psychological health			
GHQ	Working hours	.21***	
	Difficulty in paying bills	-.26****	
	Considered abandoning course for financial reasons	-.29****	
Social Functioning		.15***	
Vitality		.18**	
Role Limitations—Emotional		.08	
Physical health			
General health perceptions		.15***	.13*
Physical functioning		.16***	.13*
Bodily pain		.14**	.16***
Role Limitations—Physical		.12*	.11*
Number cigarettes smoked		-.19***	
Units alcohol consumed		.03	
Drug use		-.07	

Note. GHQ = General Health Questionnaire. Considered abandoning course applies to all dependent variables.
 * < .05; ** < .01; *** < .005; **** < .0005.

suitable comparisons, we grouped age as it was used in the Jenkinson study: 18 to 24, 25 to 34, 35 to 44, 45 to 54, and 55 to 64.

Next, we calculated weighted means for the SF-36 variables in this sample on the basis of the age/sex distribution of the sample used by Jenkinson et al to produce normative data. The sociodemographic characteristics of the Jenkinson sample closely resembled the 1991 UK population estimates. We subsequently performed *z* tests to determine if

the mean SF-36 scores in our sample differed significantly from that population.

We used SPSS Version 7.0 to perform 14 analyses, all controlled for age and sex. We regressed GHQ scores on three independent variables—hours worked outside the university, difficulty in paying bills, and considering dropping out. Each of the SF-36 dimensions was regressed on considering dropping out for financial reasons. In four additional analyses, symptom score, units of alcohol consumed

in the preceding week, cigarettes smoked, and drug use were regressed on considering dropping out for financial reasons.

Finally, using results from the above analyses, we empirically derived a structural equation model²¹ to describe the pathways linking financial stress to mental health. We analyzed the model by maximum likelihood estimation, using EQS version 5.7²² on the assumption of multivariate normality. For an appropriate model to fit the data satisfactorily, chi-square values must be nonsignificant with an index of fit greater than .90.

RESULTS

Descriptive Statistics

Just under half of the sample (47.5%) were found to be currently in debt, with the money owed on average equal to £3,432 ($SD = £4,773$). A large majority ($n = 251$, 72.8%) of the students experienced some difficulty in paying bills, with 16 reporting great or very great difficulty in doing so. More than half ($n = 193$, 53.6%) of the students in the sample were working in addition to studying; their average work week amounted to 17.62 hours ($SD = 11.63$).

Descriptive statistics for completed SF-36 dimensions and the GHQ are presented in Table 1. Comparisons with the population data for people of the same age and sex showed similar scores on Physical Functioning. However, we found that scores on Bodily Pain, Role Limitations Physical, Role Limitations Emotional, General Health Perceptions, Vitality, Social Functioning, and mental health (as assessed by the GHQ) were significantly worse than established norms. Of these measures, the psychological and psychosocial dimensions of health²³ appear to show substantially poorer functioning. For example, 29.3% of the respondents' GHQ scores were in excess of one standard deviation above the population mean for their age and sex, whereas 42.4% of the respondents produced Social Functioning scores more than one standard deviation below the population mean. This disparity (29% v 42% beyond one SD) is, itself, statistically significant ($p < .0001$).

A number of respondents reported knowing someone involved in prostitution ($n = 13$, 3.6%), crime ($n = 43$, 11.9%), and drug dealing ($n = 82$, 22.8%). Those in debt were more likely to answer in the affirmative for prostitution, $\chi^2(1, N = 13) = 3.53$, $p = .06$, relative risk = 3.81; drug dealing, $\chi^2(1, N = 82) = 8.06$, $p = .004$, relative risk = 1.71, and crime, $\chi^2(1, N = 43) = 8.26$, $p = .004$, relative risk = 2.38.

Univariate Regression

Results from the regression analyses are summarized in Table 2. Higher GHQ scores, indicative of poorer mental health, were significantly related to working longer hours outside of the university, difficulty in paying bills, and having considered dropping out of studies. Respondents who had considered dropping out for financial reasons and those who had not were significantly different on three of four

measures of psychological functioning, four of five measures of physical functioning, and one of three health behaviors.

All of these findings indicated that students who were considering abandoning their programs of study had poorer health. Those students were also found to smoke more cigarettes. Differences in indices of physical health remained significantly different statistically and of similar effect sizes after further adjustment for number of cigarettes smoked.

Structural Equation Modeling

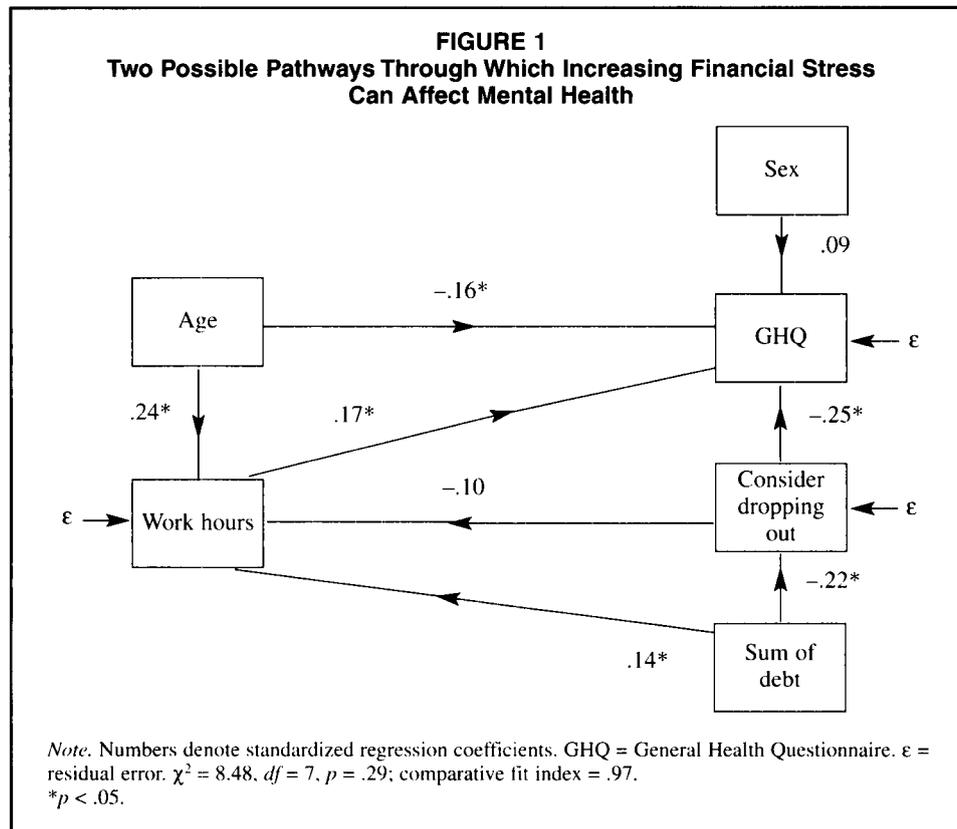
The structural equation model presented in Figure 1 describes two possible pathways through which financial stress can have an impact on mental health. First, as the amount of debt increases, the likelihood of considering abandoning studies increases, which has a negative impact on mental health. Second, as the amount of debt and the likelihood of considering abandoning studies both increase, longer hours are worked. That, in turn, affects mental health negatively. We found this model fit the data well, $\chi^2 = 8.48$, $df = 8$, $p = .29$, with a comparative fit index (CFI) equal to .97. All model parameters were statistically significant ($p < .05$) except for the effect of sex on GHQ scores and of considering dropping out on hours worked.

The hypothesized model provides a significant improvement in fit compared with the null model of independence based on a chi-square difference of 59.71 with 7 degrees of freedom ($p < .001$). Because these models, in many circumstances, do not permit satisfactory inclusion of categorical dependent variables,²¹ the parameter estimate for the effect of the amount of debt upon considering dropping out is subject to bias. To estimate the extent of this, we computed a discriminant function analysis (adjusted for prior probabilities) with amount of debt as the independent variable. The resulting canonical discriminant function yielded a canonical correlation of .17, $\chi^2 = 9.69$, $df = 1$, $p = .002$.

If age and sex are further added as independent variables, the correlation of .19, $\chi^2 = 12.54$, $df = 3$, $p = .006$, shows closer agreement to the standardized estimate of .22 derived from the structural equation model. Thus, the effect size produced under the assumption of multivariate normality does not appear to be seriously biased in this instance. Because our primary purpose in modeling is to provide a descriptive account of the interrelationships between financial circumstances and health outcomes, we do not believe the possible suboptimality of the modeling process in the present context compromises our interpretation of the data. In any event, it can be argued that the wrong linear model can lead to better results than approaches that treat categorical variables distinctly.²²

COMMENT

In this study, most of the indicators of physical ill health and psychological well-being are markedly poorer than the population norms established for people of the same age and sex. These data further show that grounds exist for linking adverse mental and physical health to the experience of



financial difficulties. Echoing these findings, Hodgson and Simoni²⁴ found students' financial problems were linked to poor academic performance, poor psychological functioning, and depression.

An association between poor health and financial problems could arise in two ways: either the stress of monetary problems directly affects health, or people with poorer health may be more likely to get into financial difficulty, principally through the lack of opportunities for work. Although the possibility of health's being causally related to financial difficulties cannot be entirely eliminated in a cross-sectional study such as this, the fact that financial difficulties are also associated with longer working hours makes it unlikely. It is certainly difficult to envisage any obvious reasons why those with poorer health (be it mental or physical) would work longer hours. Indeed, it can be argued that in modern, highly competitive economies, such as we live in, it is people with poorer mental health who are likely to be denied the opportunity to work.²⁵⁻²⁷

The data suggest that the magnitude of any adverse effects resulting from students' financial circumstances are greater in the psychosocial domain. However, it must be remembered that this data is cross-sectional only. Further longitudinal work, in which changes in both health and financial circumstances could be tracked, would make it possible to clarify the situation.

Even if it were conclusively demonstrated that financial stress during the length of student life has no effect on physical health, a concern must remain for the physical health of

the children of students. Of the 32 members in our sample who had children, an overwhelming majority ($n = 27$; 84%) reported difficulty in paying bills and 17 members (53%) reported being in debt. Economic hardship for students who are also parents must, of course, entail economic hardship for the students' offspring. Because many studies attest to a direct link between poor childhood socioeconomic conditions and future morbidity,²⁸⁻³² future adverse consequences from student financial hardship are likely to be reflected in the health of future generations. With more than 2.4 million people currently in continuing, further, and higher education in the UK and a sizable proportion of these of child-bearing age,³³ the burden of the ensuing potential ill health should not be underestimated.

The results of this survey based on data from 360 people must be viewed with some caution. Where comparisons are possible, the results are broadly similar to representative national student surveys in terms of the percentage of the sample in debt, amount of money owed, and the proportion working in addition to studying. However, we have not established that the relationships we posit exist in the wider UK student population or in other international contexts. It is certainly feasible that the particular cultural context of higher education in the UK contributes in some way to these relationships. It is possible that the impact of financial stress may be mediated differently or attenuated by more established coping strategies in other national contexts in which students' self-financing has always been the norm. Given the ubiquitous nature of the links between financial

status and ill health that have been established in epidemiologic research, we hypothesize that relationships similar to those posited would be found.

We believe that replication in a wider student population is important because very poor student health on a large scale would have implications for providing health services in the confines of the university, as well as in the wider community of which the university is a part. Similarly, widespread psychological ill health in the student body would affect the quality of life of a substantial section of the population. We would argue not only for further research but also that the subjects of student finance and ill health are a single concern and belong in the realm of public health.

We plan further work to examine these relationships in a longitudinal study that will make it possible to get a clearer picture of who drops out of college and whether this can be predicted from previous financial circumstances. We also intend, wherever possible, to follow up on students after graduation to investigate any long-term effects from the circumstances experienced during college life. We will also investigate the posited relationships between debt, crime, and prostitution, topics that have remained largely anecdotal until now.³⁴

In conclusion, the evidence suggests university students are experiencing serious detriments in health, social functioning, and vitality. Grounds exist for linking these difficulties to levels of financial hardship. Further investigations are needed to establish whether these relationships exist in the wider UK student population and also internationally.

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NOTE

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APPENDIX

Sample Questionnaire Items

A. Assessment of Smoking, Drug, and Alcohol Use

- Do you smoke cigarettes now? Yes 1
No 2
- How many cigarettes do you currently smoke/day? _____
If not a present cigarette smoker, did you smoke in the past?
Yes 1
No 2
- Have you had an alcoholic drink in the last 7 days?
Yes 1
No 2

If yes: In the last 7 days how many drinks have you had of each of the following?

(Please remember that a drink poured at home could be equivalent to 2 or 3 pub measures—for extra-strength beers and lagers count double)

- Spirits (whiskey, gin, vodka, etc) measures _____
Wine (including sherry, port, vermouth) glasses _____
Beer (including lager and cider) pints _____

B. Recreational Drug Use

For each of the following, please indicate by means of a tick in the appropriate box

- Whether you used any of these before starting university
- Whether you are currently using any of the drugs listed below
- Whether you have used any of the drugs since beginning your course

	Before university	Currently	Since starting course
Magic mushrooms	_____	_____	_____
Ecstasy	_____	_____	_____

- LSD (Acid) _____
- Sulphates (Speed) _____
- Cannabis (Puff) _____
- Tranx (tranquilizers) _____
- Cocaine (Crack, Charlie) _____
- Heroin (Smack) _____
- Solvents (eg, glue) _____
- Injected drugs (any type) _____

C. Work

During term time, are you currently working in addition to studying?

- Yes 1
No 2

If yes: Please state the number of hours per week this involves
Hours/week _____

Finances

- How much difficulty do you have in meeting the payment of bills?
- | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very great | Great | Some | Slight | Very little | None |
| <input type="checkbox"/> |

Have you seriously considered abandoning your course because of any financial difficulties. Please answer Yes only if this has been a serious consideration, not simply worrying about finances.

- Yes 1
No 2

Do you know of any students (male or female) who have engaged in the following to help support themselves financially?
Drug dealing 1 Prostitution 2 Crime 3

D. The General Health Questionnaire

Have you recently

- Been able to concentrate on whatever you're doing?
Better than usual 1 Same as usual 2 Worse than usual 3 Much worse than usual 4
- Lost much sleep over worry?
Not at all 1 No more than usual 2 Rather more than usual 3 Much worse than usual 4
- Felt that you are playing a useful part in things?
More so than usual 1 Same as usual 2 Less useful than usual 3 Much less useful 4
- Felt capable of making decisions about things?
More so than usual 1 Same as usual 2 Less so than usual 3 Much less capable 4
- Felt constantly under strain?
Not at all 1 No more than usual 2 Rather more than usual 3 Much more than usual 4
- Felt you couldn't overcome your difficulties?
Not at all 1 No more than usual 2 Rather more than usual 3 Much more than usual 4
- Been able to enjoy your normal day-to-day activities?
More so than usual 1 Same as usual 2 Less so than usual 3 Much less than usual 4
- Been able to face up to your problems?
More so than usual 1 Same as usual 2 Less able than usual 3 Much less able 4
- Been feeling unhappy and depressed?
Not at all 1 No more than usual 2 Rather more than usual 3 Much more than usual 4
- Been losing confidence in yourself?
Not at all 1 No more than usual 2 Rather more than usual 3 Much more than usual 4
- Been thinking of yourself as a worthless person?
Not at all 1 No more than usual 2 Rather more than usual 3 Much more than usual 4
- Been feeling reasonably happy, all things considered?
More so than usual 1 Same as usual 2 Less so than usual 3 Much less than usual 4

Scoring: Each item endorsed with either a 3 or 4 is scored as one point. When used as a screening test for probable psychological disorder, a cutoff point of 2 or 3 has been suggested.

Note. The questionnaires for the Appendix have been edited and some changes have been made in spelling and formatting to save space and conform to journal usage. For a copy of the original questionnaire, readers can get in touch with Dr Roberts at the address shown on page 108.