

The impact of mental illness on quality of life: A comparison of severe mental illness, common mental disorder and healthy population samples

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Abstract

Patient-centred outcomes such as quality of life (QOL) are valued and used extensively in mental healthcare evaluations, but concerns remain about their practical application due to perceived measurement issues, including responsiveness and relationships with objective indicators and depression. Evidence from general population studies challenge some assumptions, suggesting that measurement difficulties might relate to the characteristics of mental health samples, rather than measurement itself. This paper assesses the impact of mental illness on QOL and its measurement, examining whether the life-conditions, opportunities and QOL of different mental health-status groups vary, and if explanatory models of domain-specific and global QOL differ. Objective life-conditions, access to life-opportunities and subjective QOL were assessed over 2 years, using the same methodology in severe mental illness (SMI; n = 149 (baseline)/n = 126 (follow-up)), common mental disorder (CMD; n = 794/354) and no disorder (n = 1119/583) groups. Objective life-conditions were worse in the SMI group than in mentally healthy population and CMD groups, but the opportunities available to the SMI group were no more restricted than the CMD group. Subjective QOL ratings reflected this; SMI group scores were lower than the healthy population and in some life-domains the CMD group. Models of QOL suggested that life-quality was explained differently in the three groups. QOL studies combining mental health samples should control for health-status group, and domain-specific and global indicators of lifestyle and opportunity.

Key words: Common mental disorder, General population, Measurement, Severe mental illness
Quality of life

Background

Patient-centred outcomes such as quality of life (QOL) are valued by policy makers [1–3] and are used extensively in evaluations of mental healthcare because they reflect service users' interests [4, 5] and facilitate multidimensional outcome assessments that are consistent with goals of recovery and social inclusion. Nevertheless, in the mental health field, concerns remain about the practical application of QOL outcome measures.

These concerns are fuelled by arguments about definition, and suggestions that objective and subjective QOL are unrelated [6, 7] and (despite some evidence to the contrary) [8], unresponsive to change [6, 9]; other worries are that QOL ratings might be subject to adaptation and response shift (modifications of responses due to aspiration or resignation) [6], that symptom reduction alone may not produce noticeable QOL improvements [10] and that QOL is merely akin to depression [11].

Evidence from general population studies challenge some of these assumptions [12–15], leading one to question whether perceived QOL measurement issues relate to the characteristics of the samples available in mental health settings, rather than measurement itself. Insufficient high quality evidence exists to determine how QOL is explained in different mental health-status groups, or whether QOL models vary for people with different types of mental illness (e.g. people with severe mental illnesses such as schizophrenia and people with more common disorders such as anxiety and depression), and people who are mentally healthy.

Our knowledge and understanding of these issues would be enhanced by direct comparisons between people with severe mental illness (SMI) receiving care and treatment from community mental health services, people with mental health problems not receiving community-based care and mentally healthy people in the general population [8]. Such a comparison would also provide norms and benchmarks for the different mental health-status groups. Nevertheless, literature searches suggest that few studies of this type have been undertaken. Existing investigations tend to be cross-sectional, relying on retrospective comparisons between SMI and general population samples [16, 17], or do not provide comparable ratings for SMI, common mental disorder (CMD) and mentally healthy populations [18, 19]. QOL models and measurement properties have yet to be tested in a single model that controls for these health-status groups, measuring QOL in the same way in each group.

The QOL model [20] underpinning this study incorporates all features of Campbell et al.’s model [21] for general populations and Lehman’s model [17] for mental health samples. Informed by existing evidence [e.g. 17, 21, 22] the model assumes:

- a bottom-up relationship between domain well-being and ‘overall’ well-being or life satisfaction (i.e. that life satisfaction is dependent on domain satisfactions);
- domain satisfactions are determined by objective life-conditions and the perception and evaluation of those conditions based on comparison with some internal or external criteria (e.g. aspirations, needs and life-opportunities).

Unlike the Campbell model it also allows personal characteristics and objective life-conditions to have a direct effect on life quality.

Aims

This study aimed to assess the relative impact on QOL and its measurement, of different types of mental illness, by comparing three groups – a healthy population, people with common mental disorders (CMD – predominantly anxiety and depression) not necessarily receiving mental health care and people with SMI receiving support from mental health services. The purpose was to determine whether and under what conditions:

- the lifestyles (life-conditions and opportunities) of healthy population, CMD and SMI groups differ;
- subjective QOL ratings differ between mental health-status groups;
- explanatory models of domain-specific and global QOL are similar for each health-status group, i.e. demonstrating similar relationships between objective life-conditions, life-opportunities and subjective QOL.

On the basis of the limited evidence available in the field the following hypotheses were tested in these data:

- people with SMI are disadvantaged in terms of their lifestyles when compared to CMD and healthy population groups;
- global and domain QOL ratings are lower in the SMI group than in both other groups.

Method

This study involved secondary analysis of data derived from two studies – a community survey examining the QOL and mental health outcomes of urban regeneration [23, 24] and Manchester site data from the UK700 randomised control trial of case management [25]. Objective life-conditions, life-opportunities and subjective QOL were assessed at two time-points, using the same methods in the three mental health-status groups. Valid comparisons were possible as the original studies were conducted in similarly deprived, adjoining areas of South Manchester (mean deprivation scores for electoral wards in the survey area = 63.5; mean for the trial area = 56.7) [26], and data were collected over the same period of time (baseline and 2-year follow-up). The methodologies for the base studies are detailed elsewhere [23–25].

Healthy population and CMD group data originated from a postal survey of a randomly selected sample of community residents drawn from the most up-to-date electoral registers (March 1998) and collected in 1999 and 2001; eligibility depended on age (18+) and living in community residences (residents of institutions and residential establishments were excluded). Although the low response rate (17%) might have affected the generalisability of results, it is likely that the results are representative [23, 24] because the resulting sample closely matched demographically the population from which it was derived [27], life circumstances were representative of those reported for similar deprived areas [28] and subjective QOL ratings were in accordance with those of national, representative household samples [29] when age and deprivation were accounted for; follow-up rates were also reasonable in healthy population (52%) and CMD (46%) groups. The data presented here are restricted to community dwelling adults aged 18–65. Healthy population and CMD groups were distinguished according to scores on the GHQ-12, a dimensional indicator of CMD [30] (with satisfactory psychometric properties) [31], from which a summed score is produced (higher scores indicating poorer mental health). The original 2/3 cut-off is recognised as an appropriate delineator of caseness in general population samples [32] and proved to be the most valid scoring system for detecting non-organic, non-psychotic morbidity [33]. More complex scoring systems for the GHQ-12 offer no advantages over simple systems and minor variations in the criteria used for defining a case make little difference to the validity of the GHQ [34]. Therefore respondents who scored < 3 on the baseline GHQ scale were classified as not-symptomatic and assigned to the healthy population group (baseline n = 1119; follow-up n = 583, 52%), while those scoring ≥ 3 were classified as symptomatic and formed the CMD group (baseline n = 794; follow-up n = 354, 46%).

SMI data came from the UK700 study, conducted in 1994 and again in 1996, at four UK hospital sites (three in London and one in Manchester), each serving populations with substantial deprivation. Newly referred patients were recruited at each site over a period of 12–15 months, whereas existing patients (i.e. those already known to the mental health services)

were identified by a review of inpatient and outpatient registers. Eligibility was dependent upon: age (18–65); presence of delusions, hallucinations and thought disorder according to Research Diagnostic Criteria (RDC) [35]; psychotic illness of at least 2 years duration; and a minimum of two psychiatric hospital admissions, at least one of which was in the 2 years prior to recruitment. Patients were excluded from the study if they had organic brain damage or a primary diagnosis of substance abuse. In order to improve the comparability and homogeneity of data, a sample of community dwelling adults with SMI (baseline n = 641; follow-up n = 571, 89%) was constructed by excluding patients who were in hospital at baseline, homeless at baseline or follow-up, or for whom baseline living arrangements data were not available (n = 67). For the purposes of this comparison SMI data (collected in patient interviews) were confined to the Manchester service (baseline n = 149; follow-up n = 138, 94%); the follow-up rate of the SMI group was higher than those for general population and CMD groups because they were in active treatment.

Measures

Dependent variables

Subjective life-quality was assessed in the same way in the three health-status groups, using the Lancashire Quality of Life Profile (LQOLP) [36] for the SMI group (n = 149), and a shortened version adapted for use in general populations (Quality of Life in the Community Scale (QOL-COMM)) [23] for the CMD (n = 354) and healthy population (n = 583) groups. The LQOLP and the shortened version include identical objective and subjective QOL indicators, covering the same life-domains (work, leisure, finance, living situation, safety, family, social life and health (including mental health)), and scored identically in each version.^{1,2} ‘Global’ and domain life-quality

¹ The LQOLP was shortened only in the sense that other component measures such as the Rosenberg Self-Esteem Scale, Bradburn Affect Balance Scale and Cantril’s Ladder had been removed.

² These domains are the same as those assessed originally by Andrews and Withey [12].

were rated subjectively using Andrews and Withey's seven-point delighted-terrible scale [12], on which a low rating (1) indicates extreme dissatisfaction and a high rating (7) extreme satisfaction. Two measures of 'global' life-quality were produced: 'overall' QOL measured as the mean of domain satisfaction scores and 'general' life-quality, calculated as the mean of two 'life as a whole' measures, included at the beginning and end of the questionnaire. Satisfactory psychometric properties have been reported for the LQOLP [36] and the QOLCOMM [23].

Explanatory variables

Personal characteristics and objective life-conditions (capturing the QOL domains outlined above, excluding leisure) were assessed using categorical or continuous indicators that were common to the LQOLP and the QOLCOMM (community sample version; see Table 1). Domain-specific opportunities (i.e. in finances, living situation, safety, family and health) were binary rated by respondents indicating whether or not in the past year they had wanted to change an aspect of their life but had been restricted in doing so (also using common items from the LQOLP and QOLCOMM). In the absence of clinical measures for the healthy population and CMD groups, depressive symptoms, disposition and disability were assessed using validated single-item measures, taken from Bradburn affect-balance scale [37] or GHQ [31] for depressive symptoms, Rosenberg self-esteem scale for disposition [38], and the LQOLP or national population census for disability.

Statistical analysis

Data were analysed using SPSS for Windows (version 11) and STATA (version 8). Cross-sectional analyses were undertaken to explain the relationship between QOL and explanatory variables separately at each time-point. Multivariate analyses of 'long' format data, in which baseline and follow-up data are entered in separate records and an additional variable for 'time' is created were also performed, using random-effects regression. All data were checked for skewness and outliers, and where appropriate transformations or non-parametric techniques were applied. Adjustments for multiple significance-testing of

QOL outcomes (i.e. domain and global) were made using the Simes procedure [39]. Regression models were checked for multi-collinearity (a correlation $> r = 0.7$ indicating multi-collinearity effects) [40] and model fit, and other model assumptions were examined by plotting residuals; where necessary outlying residuals were removed and regression analyses repeated. Unless stated in the text, the results presented remained unchanged by these procedures.

Univariate analysis

Chi square statistics (χ^2) were used to compare the personal circumstances and life-conditions (including opportunities) of the three health-status groups (SMI, CMD and healthy population). The magnitude of between-group differences was estimated using Cramer's V statistics. Between-group differences in QOL were examined in cross-sectional data using analysis of variance (ANOVA) with *post hoc* Bonferroni adjustments, and Kruskal-Wallis tests (for variables with skewed distributions). The magnitude of between-group differences was standardised as η^2 , the ratio of the between-groups sum of squares to the total sum of squares; this is a commonly used effect size that ranges from zero to one. Changes over time in objective life circumstances, depressive symptoms and subjective QOL were tested using McNemar tests or paired *t*-tests, and standardised as an effect size using the formula:

$$\eta^2 = \frac{t^2}{t^2 + (n - 1)}$$

The magnitude of effects was classified as small ($\eta^2 = 0.01$), medium ($\eta^2 = 0.06$) or large ($\eta^2 = 0.14$) [41].

Multiple regression analysis

Regression models assumed that subjective QOL was associated directly with health-status group, objective life-conditions and time, but that these associations were confounded by the presence of depressive symptoms and disposition, and mediated by personal characteristics and opportunities to make lifestyle improvements. In order to maximise the data available, repeated-measures regression models using 'long-format' data were performed (using the 'xtreg' command in

Table 1. Baseline sample characteristics by study group

	Healthy population (n = 1,119)		Common mental disorder (n = 794)		Severe mental illness (n = 149)		χ^2/F^*	η^2 /Cramer's V
	Mean/%	n/SD	Mean/%	n/SD	Mean/%	n/SD		
Demographics								
Mean age	41.3 years	SD = 13.4	39.0 years	SD = 12.9	37.5 years	SD = 10.7	10.49	0.010
Male	51.4	572	45.1	355	52.3	78	8.14	0.063
Married	43.4	483	36.2	287	14.2	21	49.75	0.156
White	96.6	1073	96.8	767	61.7	92	306.52	0.386
Life circumstances								
Employed	60.8	668	43.5	340	5.4	8	182.89	0.300
Mean hours worked	37.6 h	SD = 12.0	35.8 h	SD = 13.3	23.7 h	SD = 14.9	6.11	0.011
Mean income (excl outliers) ^a	£758.40	SD = 472.12	£633.83	SD = 437.54	£378.30	SD = 176.43	47.42	0.573
Receiving benefits	34.9	333	52.0	344	97.3	145	213.71	0.348
Home owner	45.1	500	33.4	261	22.1	33	45.48	0.149
Months in accommodation	149.44	SD = 147.96	117.92	SD = 134.29	79.92	SD = 121.07	21.72	0.021
Accused of a crime	1.3	14	3.3	26	13.2	19	65.99	0.179
Victim of crime	4.2	47	11.5	91	11.8	17	39.32	0.138
Family contact								
Daily	37.9	423	37.7	299	46.2	67	74.24	0.134
Weekly	48.8	545	43.3	343	24.8	36	71.54	0.187
Monthly	10.2	114	13.1	104	13.1	19		
Annually	2.2	25	2.3	18	6.9	10		
< Annually/not at all	0.9	10	3.7	29	9.0	13		
Live with family	73.3	817	71.0	562	39.6	59	194.44	0.315
Have a close friend	94.5	1003	89.2	676	56.9	82	52.82	0.162
Seen a friend in the last week	79.7	871	72.4	562	52.8	75	98.63	0.219
Illness/disability	25.8	287	42.2	333	7.5	11	1073.89	0.724
Depressive symptoms	5.8	65	77.7	614	67.1	94		
Life-opportunity restrictions in								
Finance	58.0	628	79.7	618	70.9	100	98.09	0.222
Living situation	66.3	733	83.8	662	52.8	75	98.71	0.220
Safety	24.5	272	46.6	367	14.1	20	126.29	0.249
Family	27.5	307	47.5	376	37.8	51	80.44	0.198
Health	10.0	111	28.5	224	28.6	38	115.48	0.239

^aIncome differential between-groups was almost identical when 'raw' income data and income data from which extreme outliers were removed were compared, but the latter were used in all analyses, because they were subject to less measurement error.

*All χ^2/F significant at $p < 0.001$, except for % male ($p = 0.017$) and mean hours worked ($p < 0.005$).

STATA), which took account of the dependence of the same individual's observations at the two time-points. Simultaneous and hierarchical variable selection processes (in which blocks of variables were added sequentially) were used to examine the individual and combined influences of key variables, but for simplicity only the final models are presented in this paper. Initial models were constructed using data for the entire sample, controlling for health-status group, time, demographic characteristics, objective life-conditions and opportunities, and personal and clinical attributes including disposition, disability and depressive symptoms. Differences in associations between groups and over time were then examined in models that included interaction terms (group \times explanatory variable) or (time \times explanatory variable). Finally, separate models for each health-status group helped to clarify the nature of any significant differences.

Results

Personal and lifestyle characteristics

Table 1 illustrates that the three health-status groups differed demographically and in their baseline life-circumstances. In all domains except illness/disability, the SMI group was disadvantaged compared to one or both other groups. There was a downward trend in mean scores and percentage values from the healthy population to the CMD and SMI groups for many outwardly positive aspects of life (e.g. employment, marriage, income, social contact), and a similar upward trend from healthy population to SMI groups for some more negative aspects of life (e.g. benefit receipt, crime victimisation). Overall, CMD group members were more similar to the healthy population than they were to the SMI group, with the striking exception of victimisation, and as one might expect, presence of depressive symptoms. Nevertheless, the CMD group differed markedly from both others in its reporting of long-standing illness/disability. Unsurprisingly, the magnitude of mental health-status effects was greatest for depression, income and benefit receipt, having a close friend and employment status variables. This pattern of results was repeated generally at follow-

up, as statistically significant changes in life circumstances were limited, for those responding at both time-points [42].

Table 1 also demonstrates that perceived life-opportunities varied by health-status group at baseline, tending to be most restricted in the CMD group. The SMI group was significantly less restricted than the CMD group in safety and living situation, and both groups were significantly more restricted than the healthy population in the health domain; opportunities were not more or less restricted in the SMI group than in the other groups for any other domains. Similarly sized restricted opportunity effects were observed in all domains. Perceptions about opportunity restrictions varied significantly over time in the SMI group (but not the others), becoming less restricted in most domains (finance and living situation $p < 0.001$, safety and health $p < 0.005$, family $p = 0.522$).

Subjective life-quality

The mean subjective QOL scores presented in Table 2 suggest that personal and lifestyle differences were accompanied by variations in subjective QOL ratings, as all aspects of subjective QOL differed significantly between health-status groups, at both time points. When standardised, the magnitude of the group effect (at baseline) was small for safety, moderate for work, leisure, finance, living situation, family and social, and only large for health, 'general' and 'overall' QOL. For most aspects of life-quality there was a downward trend in ratings between healthy population, CMD and SMI groups (reflecting inversely the objective life-conditions of the three groups). QOL tended to be statistically significantly higher in the healthy population than in the other two groups.³ In leisure, SMI group scores were highest and differed with statistical significance from the CMD group ($p < 0.001$), but not the healthy population. The general pattern of results was somewhat similar at follow-up, in that

³ Differences in safety, between the healthy population and the CMD group became insignificant when data were transformed to accommodate negative skewness in the dependent variable. Significant differences between the CMD and SMI groups also emerged in safety and social domains following data transformation, but their relative ratings for work and 'overall' QOL did not alter.

Table 2. Subjective QOL by study group

QOL indicator	Healthy population (n = 1119/583)	CMD (n = 794/354)	SMI (n = 149/126)	<i>F</i> *	η^2
	Baseline mean QOL score (SD), Follow-up mean QOL score (SD)				
Life in 'general'	5.39 (0.86)	4.19 (1.29)	3.86 (1.43)	337.99	0.25
	5.12 (0.96)	4.25 (1.30)	4.45 (1.40)	69.58	
Life 'overall'	5.06 (0.67)	4.23 (0.86)	4.18 (0.79)	310.43	0.23
	4.99 (0.70)	4.31 (0.88)	4.79 (0.76)	83.8	
Work	4.77 (1.46)	3.81 (1.69)	3.73 (1.69)	82.46	0.07
	4.88 (1.40)	4.02 (1.67)	4.83 (1.27)	33.75	
Leisure	4.40 (1.29)	3.47 (1.51)	4.46 (1.31)	108.1	0.09
	4.35 (1.26)	3.63 (1.56)	4.88 (0.98)	50.94	
Finance	4.02 (1.41)	2.91 (1.57)	3.51 (1.58)	129.16	0.11
	4.20 (1.44)	3.19 (1.64)	4.42 (1.60)	56.28	
Living situation	5.60 (0.91)	5.00 (1.24)	4.59 (1.45)	101.94	0.09
	5.55 (0.95)	5.17 (1.13)	5.20 (1.28)	16.56	
Safety	4.64 (1.00)	4.09 (1.21)	4.32 (1.52)	55.57	0.05
	4.51 (0.96)	4.05 (1.15)	4.83 (1.37)	31.9	
Family	5.95 (1.02)	5.36 (1.45)	4.59 (1.34)	107.14	0.1
	5.89 (1.06)	5.38 (1.34)	4.96 (1.43)	40.67	
Social	5.39 (1.20)	4.67 (1.70)	4.38 (1.51)	74.5	0.07
	5.33 (1.18)	4.77 (1.57)	4.69 (1.52)	24.07	
Health	5.67 (0.86)	4.45 (1.31)	4.05 (1.34)	355.27	0.26
	5.18 (0.96)	4.24 (1.29)	4.57 (1.26)	79.77	

* $p < 0.001$ in life in 'general', life 'overall' and in all domains at each time point.

the SMI group again reported significantly lower ratings than the healthy population in most domains; differences between the SMI and CMD groups were less consistent over time.

Repeated measures regression analyses confirmed that these group effects were stable over time and were not confounded with other explanatory variables, as health-status group was statistically significantly associated with all aspects of QOL when time, demography, objective circumstances, and personal or clinical characteristics such as depression, disability, disposition and opportunity were controlled for. For most aspects of life-quality (except life 'overall'), SMI group ratings were significantly lower than those for the healthy population but their ratings for finance were significantly higher than the healthy population group. CMD group membership was associated with statistically significantly lower scores (compared to the healthy population) in all aspects of life-quality. *B* coefficients demonstrated that for some aspects of life-quality (e.g. 'general' QOL, finance and safety) the magnitude of the effect of SMI group membership was similar to that of CMD group membership, in

that QOL ratings were lowered by similar amounts compared to the healthy population. In other respects the effects of SMI and CMD group membership differed considerably; SMI group membership seemed to have a stronger association with general health, family and living situation, whereas CMD group membership had a stronger association with mental health and life 'overall'.

Models that controlled for the interaction between health-status group and other explanatory variables indicated that QOL was explained differently in the three groups (i.e. associations between QOL and objective circumstances, presence of depressive symptoms and time often varied significantly between groups). Separate regression models for each health-status group (Table 3) showed that most lifestyle indicators were not statistically significantly associated with subjective life-quality in the SMI group, but that statistically significant associations between life-conditions and subjective QOL were observed more frequently in CMD and healthy population groups. Depressive symptoms contributed significantly to the explanation of most QOL models in all study

Table 3. A comprehensive model of global and domain QOL (at both time-points), by study group

QOL indicator	Explanatory variable	Healthy population <i>B</i> coefficient*	CMD group <i>B</i> coefficient*	SMI group <i>B</i> coefficient*
Life in 'general'		R^2 overall = 0.259	R^2 overall = 0.364	R^2 overall = 0.347
	Depressed cf not depressed	-0.46	-0.66	-0.75
	Mental health consultation	-0.34	-0.25 ^c	
	At least monthly family contact	0.30 ^c		
	Health opportunities restricted	-0.26 ^a	-0.39	
	Financial opportunities restricted	-0.24	-0.26 ^c	-0.52 ^b
	Living situation opportunities restricted	-0.21		
	Married cf not married	0.2	0.23 ^c	
	Positive cf negative disposition	0.2	0.28	0.63 ^a
	Time	-0.19	-0.15 ^d	0.43 ^d
	Safety opportunities restricted	-0.15 ^c		
	Family opportunities restricted	-0.14 ^c	-0.26 ^a	
	Income (per £1000)	0.12 ^c	0.28 ^b	
	Age	< -0.01 ^b	-0.01 ^a	
Home owner cf not a home owner		0.26 ^c (0.016)		
Life 'overall'		R^2 overall = 0.386	R^2 overall = 0.405	R^2 overall = 0.481
	Safety opportunities restricted	-0.33	-0.33	
	At least monthly family contact	0.32	0.25 ^c	
	Financial opportunities restricted	-0.28	-0.28	-0.19 ^d
	Health opportunities restricted	-0.24	-0.23	
	Depressed cf not depressed	-0.21	-0.23	-0.38
	Mental health consultation	-0.17 ^a	-0.25	-0.69 ^c
	Living situation opportunities restricted	-0.16		-0.38
	Positive cf negative disposition	0.13	0.15 ^b	
	Married cf not married	0.12 ^a		
	General health consultation/disability	-0.10 ^b		
	Income (per £1000)	0.10 ^b	0.23	0.65 ^b
	Family opportunities restricted	-0.09 ^b	-0.12 ^c	-0.28 ^c
	Time	-0.08 ^a		0.28 ^b
Home owner cf not a home owner		0.19 ^a		
Finance		R^2 overall = 0.435	R^2 overall = 0.410	R^2 overall = 0.491
	Financial opportunities restricted	-1.46	-1.35	-1.6
	Income (per £1000)	0.53	1.12	2.12
	Depressed cf not depressed	-0.39	-0.32 ^a	-0.54 ^a
	Disability cf no disability		-0.27 ^c	
	Age	< -0.01 ^b		
Living situation		R^2 overall = 0.195	R^2 overall = 0.184	R^2 overall = 0.287
	Living situation opportunities restricted	-0.51	-0.64	-1.21
	White cf other	0.35 ^c	0.38	
	Married cf not married	0.32	0.45	
	Home owner cf not a home owner	0.3	-0.19 ^c	
	Depressed cf not depressed	-0.23		
	Positive cf negative disposition	0.18		
	Time	-0.10 ^b		0.30 ^d
	Male cf female			-0.48 ^b
	Age	< -0.01 ^b	-0.07 ^b	
Safety		R^2 overall = 0.254	R^2 overall = 0.300	R^2 overall = 0.114
	Safety opportunities restricted	-0.95	-1.08	
	White cf other	-0.33 ^c		
	Male cf female		0.16 ^c	
	Time	-0.11 ^b		0.42 ^b
	Positive cf negative disposition			0.48 ^c

Table 3. Continued

QOL indicator	Explanatory variable	Healthy population <i>B</i> coefficient*	CMD group <i>B</i> coefficient*	SMI group <i>B</i> coefficient*
Family		R^2 overall = 0.091	R^2 overall = 0.102	R^2 overall = 0.193
	At least monthly family contact	0.94	1	0.68 ^c
	Married cf not married	0.25	0.43	
	Family opportunities restricted	-0.21	-0.27 ^a	-0.86
	Male cf female	-0.17 ^b		
	Positive cf negative disposition	0.14 ^c		
	Depressed cf not depressed		-0.19 ^c	
	Time	-0.09 ^c		0.38 ^b
General Health		R^2 overall = 0.263	R^2 overall = 0.288	R^2 overall = 0.269
	Depressed cf not depressed	-0.47	-0.47	-0.72
	Health opportunities restricted	-0.41	-0.36	-0.63 ^a
	Time	-0.39	-0.31	0.30 ^c
	Disability	-0.28	-0.63	
	General health consultation/disability	-0.27	-0.41	
	Positive cf negative disposition	0.26	0.33	0.33 ^d
	Married cf not married	0.10 ^c		
	Male cf female		-0.22 ^b	
Mental Health		R^2 overall = 0.275	R^2 overall = 0.357	R^2 overall = 0.265
	Mental health consultation	-0.45	-0.72	-0.75
	Depressed cf not depressed	-0.44	-0.39	-0.63 ^c
	Health opportunities restricted	-0.43	-0.40	0.28 ^d
	Time	-0.39	-0.33	-0.54 ^c
	Disability	-0.38	-0.67	0.34 ^d
	Positive cf negative disposition	0.24	0.32	
	Male cf female		-0.25 ^c	
	Age	< -0.01 ^c		

Note: Variables entered: time, age, gender, marital status and ethnicity, domain-specific objective indicators, depression, disability and disposition, and domain-specific opportunity.

Significant results are reported, in order to save space

Sample size requirement for the regressions was estimated as $n \geq 50 + 8m$ (where m equals the number of independent variables), but this was increased if the distribution of the dependent variable was skewed.

Unstandardised regression coefficients (B) are reported because most of the variables entered in regression models' were coded on binary scales. A variety of R^2 values were examined in order to provide an understanding of the amount of variance in QOL that was explained over time (WR^2), between people (BR^2) and in all values (R^2 overall), but for simplicity only R^2 overall values are reported.

*All B coefficients significant at $p < 0.001$ level, unless indicated as follows: ^a $p < 0.005$, ^b $p < 0.01$, ^c $p < 0.05$, ^d $p < 0.1$.

groups, but the magnitude of the effect was often greater in the SMI group; nevertheless, the presence of depressive symptoms only made a major contribution to 'general' and health models. Similarly, opportunity variables contributed to the explanation of all aspects of life-quality, in all health-status groups, but the magnitude of the association was often greater in the SMI group; a smaller number of statistically significant associations were observed between opportunity and 'general' and 'overall' QOL in the SMI group, than in CMD and healthy population groups.

Finally, the association between time and life-quality differed between the healthy population and the SMI group in many models. Although statistically significant time effects were not observed in all domains, large QOL improvements tended to occur in the SMI group. In the CMD group, QOL was relatively stable in some domains while other aspects of life-quality deteriorated somewhat, whereas all aspects of QOL deteriorated in the healthy population group, particularly those relating to health and life 'overall'.

Discussion

This study was designed to fill a gap in the evidence base and addresses important issues relating to the practical application of QOL outcomes in mental health services. It advances knowledge about QOL measurement and offers a unique insight into whether QOL models and measurement issues are similar in different mental health-status groups, utilising a statistical methodology suitable for analysis of longitudinal data, and introducing analyses for all health-status groups that have hitherto been undertaken only in one group. Unlike most studies of QOL in the mental health field, it is a large scale, 2-year follow-up study that incorporates objective and subjective indicators of QOL and examines predictors of QOL across a range of life domains. As with all studies, it has some limitations: the community survey, which generated healthy population and CMD groups was subject to a low response rate, but despite this 'non-SMI' data appeared to be representative largely of the population from which they were sampled; measures of depression, disposition and disability were limited to single-item, self-reported indicators, but appeared to provide a reasonable level of agreement with other validated health-status measures; nevertheless high levels of deprivation in the study areas and between-group differences in the receipt of treatment need to be considered when interpreting results. The discussion that follows relates the results to the study's hypotheses and locates them within the context of the study's limitations.

People with SMI are disadvantaged in terms of their lifestyles when compared to CMD and healthy population groups

While the life-conditions of people with SMI were objectively worse than healthy population and CMD groups, the opportunities available to them tended not to be any more restricted than those of people with CMD. One explanation for this unanticipated result might be that the SMI group were being helped and enabled to access their opportunities through the treatment and case-management support they were receiving, whereas an unknown number of the CMD group would

be in receipt of such help. Another explanation may be that reporting of life-opportunities was associated with the presence of depressive symptoms, which as one would expect was at its highest in the CMD group. Nevertheless, while there was an association between reports of depressive symptoms and restricted opportunities, the association was actually strongest in the SMI group.

Global and domain QOL ratings are lower in the SMI group than in both other groups

Subjective QOL ratings for the SMI group reflected generally their restricted lifestyles, being significantly lower for most aspects of life-quality, than those for the healthy population group, and lower than the CMD group in several domains. While subjective QOL differences were as anticipated for most comparisons between SMI and healthy population groups, results were not always consistent with our hypothesis. For example, the finding that subjective QOL ratings for finance were higher in the SMI group than in the healthy population might be explained as members of the SMI group being realistic in their expectations of income given the large proportion that were not working, or alternatively, as this group becoming resigned to their financial circumstances. The resignation argument cannot be sustained because the magnitude of the association between QOL and resignation in finance was greater in the general population than in the SMI group (where the association was not statistically significant); QOL ratings in the SMI group were more likely to be associated with aspiration than with resignation [42]. A more cogent explanation might relate to welfare benefits, which were received by 93% of the SMI group, compared to 35% of the general population and 52% of the CMD group, far exceeding the national average (14%) for adults of working age [43–47]. While the comparatively high rates of benefit receipt in these data reflect the level of deprivation in the local area, benefit take-up might have been particularly high in the SMI sample because of access to a systematic and thorough assessment of their benefits, undertaken by occupational therapists (OTs) in the mental health service [24].

Are explanatory models of domain-specific and global QOL similar in different mental health-status groups?

Between-group differences in the associations between QOL and other explanatory variables were observed. While these results might be due to chance or smaller (but adequate) sample size in the SMI group compared to the other groups, there are other plausible reasons for differences in the modelling process. The finding that QOL tends to be less strongly associated with current life-conditions and more strongly associated with perceived life-opportunities in the SMI group than in the other health-status groups suggests that hope may be an important determinant of subjective QOL ratings in treated populations. This argument seems credible when one considers that significant subjective QOL changes were observed in the SMI group while the proportion reporting perceived restrictions in opportunities fell significantly in all domains in that group and objective life-conditions remained relatively stable in all groups. Therefore one might argue that the SMI group rated their QOL somewhat more positively because they could see ways in which their life-conditions might improve, although improvements had yet to be achieved. This suggests that approaches to cognitive evaluation of personal QOL may differ between health-status groups, although there is little published evidence to support this assertion. Nor is there much support for the argument that QOL ratings are influenced by ones 'frame of reference' (e.g. comparison with others, comparison with previous self or aspirational self [48]), and if adaptation occurs then it is in the form of aspiration and not resignation [42].

Results pertaining to the association between depressive symptoms and QOL need to be treated with caution because of the crudeness of the depression indicators used; nevertheless, the use of single-item measures was justifiable as they agree closely with validated depression scales [48–51], and the results reported here are similar to those of other studies. Given that differences focused mainly on QOL in health, and 'general' and 'overall' life-quality they may have resulted from the relatively high prevalence of depression in the SMI group, although in this instance one might have expected differences between the general

population and CMD group to be greater (i.e. affecting more aspects of life-quality), as the prevalence of depression was also high in the CMD group. Alternatively, the differences may have related to more accurate reporting because SMI group data were collected in interviews in which clinical indicators of depression were also included, or to the SMI group being a treated sample.

The greater influence of time in the SMI group confirms that QOL changes were most evident in that group. While these changes may have reflected regression to the mean, they may also have been due to treatment effects or to products of the case management intervention; all members of the SMI group received an individual level intervention in the form of case management, whereas healthy population and CMD groups may or may not have benefited from a system level intervention (urban regeneration) that was ongoing in their area. These factors may explain why, in many domains, a greater proportion of the SMI group experienced changes in their objective life-conditions than in the other health-status groups. Although the proportion experiencing life changes in the SMI group was still small, these changes could account for the greater magnitude and breadth of subjective change in this group. Another possible explanation is that between-group differences in the propensity for change were affected by the timing of measurement, as suggested by Atkinson [15] and Schyns [52]. Although the follow-up period was the same for each group, the context was very different. Members of the healthy population and CMD groups were being assessed at a point, 2-year into a 7-year urban regeneration intervention, which was likely to have been accompanied by environmental nuisance. In contrast, the SMI group was receiving an ongoing intervention aimed at supporting and maintaining people with mental health problems in the community. Nevertheless, it seems that current treatments and interventions fail to return people to their pre-illness level of functioning. This might be because interventions have insufficient focus on rehabilitation and social outcomes, or might reflect the reality of the illness process or the side-effects of treatment. Conversely, the relative stability of differences

between the general population and CMD group may reflect the absence of treatment or the lack of impact of the system level intervention at the individual level.

Despite its limitations this study presents new evidence about QOL measurement that has important implications for research, service evaluations and routine outcome measurement, which are now considered integral components of modern service delivery. When conducting outcomes evaluations involving QOL measures clinicians should recognise that:

- health-status group needs to be controlled for in studies that include SMI and CMD groups in their samples;
- domain-specific evaluations of subjective QOL are necessary as well as global assessments of ‘general’ and/or ‘overall’ QOL, in order to reflect accurately the associations between lifestyle, depressive symptoms and subjective QOL;
- QOL assessments need to focus on individual’s desire and opportunity to change their lifestyle as well as their current life-conditions, and identifying and working with the individual’s priorities for lifestyle change may enhance the capacity for QOL improvements. Service interventions may need to be targeted on specific domains in order to produce desired effects, and measurement needs to reflect this.

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