

Burden of chronic physical conditions and mental disorders in primary care

Anna Fernández, Juan Ángel Bellón Saameño, Alejandra Pinto-Meza, Juan Vicente Luciano, Jaume Autonell, Diego Palao, Luis Salvador-Carulla, Javier García Campayo, Josep Maria Haro, Antoni Serrano and the DASMAP investigators

Background

The World Health Organization (WHO) has stated that the three leading causes of burden of disease in 2030 are projected to include HIV/AIDS, unipolar depression and ischaemic heart disease.

Aims

To estimate health-related quality of life (HRQoL) and quality-adjusted life-year (QALY) losses associated with mental disorders and chronic physical conditions in primary healthcare using data from the diagnosis and treatment of mental disorders in primary care (DASMAP) study, an epidemiological survey carried out with primary care patients in Catalonia (Spain).

Method

A cross-sectional survey of a representative sample of 3815 primary care patients. A preference-based measure of health was derived from the 12-item Short Form Health Survey (SF-12): the Short Form-6D (SF-6D) multi-attribute health-status classification. Each profile generated by this

questionnaire has a utility (or weight) assigned. We used non-parametric quantile regressions to model the association between both mental disorders and chronic physical condition and SF-6D scores.

Results

Conditions associated with SF-6D were: mood disorders, $\beta = -0.20$ (95% CI -0.18 to -0.21); pain, $\beta = -0.08$ (95% CI -0.06 to -0.09) and anxiety, $\beta = -0.04$ (95% CI -0.03 to -0.06). The top three causes of QALY losses annually per 100 000 participants were pain (5064), mood disorders (2634) and anxiety (805).

Conclusions

Estimation of QALY losses showed that mood disorders ranked second behind pain-related chronic medical conditions.

Declaration of interest

None.

The epidemiological transition from acute to chronic illness has been accompanied by a parallel change in the measurement of the health status of populations, which has moved from focusing almost exclusively on mortality rates to the introduction of functioning, disability, and health-related quality of life (HRQoL) measures. The interest in HRQoL measures has also been favoured by the progressive change of the healthcare model to a person-centred approach that takes into account the autonomy of patients and the values of society.^{1,2}

A wide variety of instruments have been developed to measure HRQoL. This paper focuses on the Short Form-6D (SF-6D),³ a multi-attribute health-status classification system with six attributes derived from the 12-item Short Form Health Survey (SF-12).⁴ Each profile generated by this questionnaire has a 'weight' or 'utility' assigned. This utility reflects the value that society gives to this health status. In a broad sense, utility could be seen as synonymous with preference: the more preferred a status, the more utility it has. In general, utilities oscillate between 0 (which represents death) and 1 (representing perfect health).³

These utilities are used to calculate quality-adjusted life-years (QALYs). A QALY is a measure that considers both quantity and quality of life and is an indicator of life expectancy weighted by the quality of life (i.e. utility) of remaining life-years. For instance, a year of life lived in perfect health is worth 1 QALY (1 year of life \times 1 utility = 1 QALY), half a year lived in perfect health is equivalent to 0.5 QALYs (0.5 years \times 1 utility), the same as 1 year of life lived in a situation with utility 0.5 (1 year \times 0.5 utility). Although QALYs are used mainly in cost-utility analysis, it has been suggested that QALYs could be useful in estimating the burden of mental health disorders.^{5–7}

Since the seminal 'burden of disease' study by the World Health Organization (WHO) and the World Bank,⁸ mental health

has been incorporated into the international health policy agenda as a top priority. An update by the WHO has stated that the three leading causes of burden of disease in 2030 are projected to include HIV/AIDS, unipolar depressive disorders and ischaemic heart disease.⁹ Nevertheless, these studies based their estimations on disability-adjusted life-years (DALYs), a measure widely criticised for using weights derived from experts' opinion on specific diseases, whereas QALYs are based on health status and weights generated from social preferences.¹⁰

This paper studies the HRQoL and QALY losses associated with mental disorders and chronic medical conditions using data from the diagnosis and treatment of mental disorders in primary care (DASMAP) study, an epidemiological survey carried out with primary care patients in Catalonia (Spain).

Method

Participants

The study was a face-to-face, cross-sectional survey of a representative sample of adult attendees (18 years or older) at primary care health centres in Catalonia. Catalonia is one of the 17 regions or 'autonomous communities' that comprise Spain. As a consequence of a devolution process started in 1981, the autonomous communities have full governance on health and social care. Healthcare and social care for people with severe disabilities are publicly financed and near-universal coverage is provided. The features of this system have been explained elsewhere.¹¹

A stratified multistage probability sample without replacement was drawn. Replacement was prohibited to ensure that every individual had a known probability of selection. The sampling frame was all the health regions in Catalonia (a total of seven).

The first stage consisted of selection of the primary care centres within each health region, with the number of primary care centres selected in each region proportional to its population. However, in order to have a minimum set of interviews even in the smaller regions, at least six primary care centres were chosen per region. Each primary care centre's selection probability was related to the population of the catchment area covered by the centre. A total of 77 health centres out of 352 participated in the DASMMap study. In the second stage, all the general practitioners (GPs) at the selected health centres were invited to participate and a total of 618 GPs did so. This represented nearly 69% of all the GPs working at the 77 health centres. The third stage consisted of the random selection of patients. Participants were selected with a systematic sampling strategy from the daily list of all patients with an appointment with each of the participating GPs. A total of 3815 participants were evaluated. The weighted response rate was 80.5%. Further information on the DASMMap study can be found elsewhere.¹²

Measures

SF-6D

Health-related quality of life was assessed using the Spanish version 2.0 of the SF-12.^{4,13,14} The SF-12 is a valid, reliable and widely-used instrument for the assessment of HRQoL.

The SF-12 was revised to produce the SF-6D, a six-dimensional health-state classification each with three to five levels. The dimensions are: physical functioning (from 1, health does not limit you in moderate activities, to 3, health limits you a lot); role limitations (from 1, you have no problems with your work or regularly daily activities, to 4, you are limited in the kind of work or other activities as a result of your health); social functioning (from 1, your health limits your social activities none of the time, to 5, your health limits your social activities all of the time); pain (from 1, you have pain that does not interfere with your normal work at all, to 5, you have pain that interferes extremely); mental health (from 1, you feel downhearted and low none of the time, to 5, you feel downhearted and low all of the time); and vitality (from 1, you have a lot of energy all of the time, to 5, you have a lot of energy none of the time). The combination of the dimensions with severity levels formed a total of 7500 distinct health states. For instance, a person with no problems will have a health state profile of '111111', whereas a person with no problems in physical functioning, role limitation or pain, but with moderate problems in social functioning such as feeling downhearted and lethargic all the time, will have a profile of '113155'.³

Each one of these health profiles has a score. The scoring table for the SF-6D was developed by Brazier and colleagues based on a variant of the standard gamble technique on a random sample of the general population of the UK.³ Using the scoring table we are able to compute the utility of each of the health profiles generated. As Spanish scores are not available, in this study we have used the UK scores for the SF-6D derived from the SF-12 questionnaire.

Mental disorders

Mental disorders were assessed with the Spanish versions of the Structured Clinical Interview for DSM-IV Axis I Disorders SCID-I (major depressive episode, dysthymic disorder and anxiety disorder modules, excluding obsessive-compulsive disorder)¹⁵ and the Mini Neuropsychiatric Diagnostic Interview (manic/hypomanic episodes, obsessive-compulsive disorder, substance and alcohol use disorders, anorexia nervosa and bulimia nervosa).^{16,17} Both instruments allow diagnoses according to DSM-IV¹⁸ criteria.

Chronic physical conditions

Chronic physical conditions were assessed using a checklist that included questions about a wide range of chronic physical conditions commonly managed by GPs such as allergies, arthritis or rheumatism, asthma, bronchitis, constipation, diabetes mellitus, heart disease, heart attack, high blood pressure, migraines or frequent headaches, neck or back pain and digestive ulcer. Similar conditions, or conditions with similar risk factors, were grouped together (i.e. chronic pain includes arthritis or rheumatism, chronic back pain, chronic neck pain, and migraines or frequent headaches; cardiovascular disease includes heart attack, and heart disease; respiratory conditions include asthma and bronchitis; high blood pressure; and diabetes). Moreover, at the end of the checklist, participants had an open question about other chronic conditions they suffered from but were not asked about in the checklist. Just 41 out of the 3815 participants responded that they suffered from a form of cancer and 8 out of the 3815 suffered from Parkinson's disease. Due to their low prevalence we did not include these in our analyses.

Procedure

A group of 20 trained psychologists evaluated participants. An expert panel of three trained the psychologists during a 2-day course. Data were collected between October 2005 and March 2006 using a paper-and-pencil personal interview. After an appointment with a GP, individuals were invited to participate in the study. They were evaluated at their primary care centres after acceptance (including provision of signed informed consent). During a clinical interview of approximately 45 min the instruments were administered. After data collection, responses were processed using the response automatic-capture software TeleForm for Windows (Autonomy Cardiff, www.cardiff.com/products/teleform/index.html). Ethical approval was obtained from the Sant Joan de Déu Foundation ethics board.

Statistical analyses

The dependent variable was the SF-6D score utility. As SF-6D scores had skewed distributions, we used a non-parametric approach. Statistical analyses were carried out in four steps. First, we looked at sociodemographic factors (gender, age, marital status, education and employment), mental disorders and chronic physical condition distributions for the participants. Proportions were weighted in order to restore the representative validity of the sample. We also presented the median of the SF-6D by sociodemographic and clinical (mental disorders and chronic physical conditions) variables. The proportion of participants reporting full health and the most frequent health-state profile were also calculated. Comparisons in the SF-6D by socio-demographic and clinical variables were conducted using the Kruskal-Wallis test. Second, to model the association between health conditions (mental disorders and chronic physical conditions) and the SF-6D, we used non-parametric quantile regression. Quantile regression extends beyond the notion of ordinary least squares, which estimates the conditional mean of a dependent variable given a set of explanatory variables. Quantile regressions can be used to characterise the entire conditional distribution of the dependent variable. The regression coefficient associated with an explanatory variable is interpreted as the marginal change in the given conditional quantile of the dependent variable corresponding to the marginal change in the variable. Comparisons of coefficients across different percentile levels allowed us to infer the effects of a certain variable at different points in the SF-6D distribution. Moreover, quantile regression is more robust to outliers.¹⁹ We based the inference

on the median (percentile 50). Mental disorders and chronic physical conditions were introduced together in the model, adjusting by those sociodemographic variables that were statistically significant ($P < 0.20$) in the bivariate Kruskal–Wallis tests. Additionally, we tested all the first-degree interactions. We compared a model with several first-degree interactions to the model with no interactions and it did not significantly improve the model fit so, following the parsimony principle, we decided not to include them. Third, to conduct sensitivity analyses, we performed eight additional quantile regressions with the inference based on the first (10), second (20), third (30), fourth (40), sixth (60), seventh (70), eighth (80) and ninth (90) deciles. We were also able to construct trend charts with the coefficients. That is, we were able to examine how the entire distribution changed after taking participants' characteristics into account. Interquartile range (IQR) regressions between extreme deciles (10 and 90) and between first (25) and third (75) quartiles were carried out with the aim of assessing whether the adjusted coefficients of the mental disorders and chronic physical conditions were different. We conducted bootstrap ($b = 500$) estimates of standard errors of regression coefficients for each decile regression.

Finally, the HRQoL loss associated with each of the disorders was estimated by multiplying the marginal effect of the conditions that reached significant criteria by the prevalence of the condition. This can be interpreted as the magnitude of the burden measured in annual loss in QALYs without considering mortality.² All analyses were carried out with the STATA 10 software for Windows. All significance tests were performed using two-sided tests evaluated at the 0.05 level of significance.

Results

We had complete data on the SF-12 from 3754 participants; 16 participants had insufficient data to calculate their SF-6D. The median SF-6D score for the whole sample was 0.77. A total of 262 out of 3754 participants had a profile representing perfect health (7.11%).

SF-6D index by sociodemographic characteristics

Table 1 shows the median on the SF-6D score by sociodemographic characteristics. Women had a lower SF-6D score than men (0.82 v. 0.72, $P < 0.0001$). The median SF-6D score decreased progressively with age, except in the oldest group. Regarding marital status, those previously married had the lowest SF-6D score. Those in paid employment but on sick leave had a median of 0.61; lower than those in paid employment (0.82). The SF-6D score was 0.73 for those participants in the lowest educational group and 0.80 for those in the highest.

SF-6D score by conditions

The median SF-6D score varied by disease group, from 0.55 for participants with any mood disorders to 0.74 for participants with diabetes or high blood pressure (Table 2). When considering specific illnesses, major depressive disorder showed the lowest SF-6D (0.53), followed by social phobia (0.60), dysthymic disorder (0.60), panic disorder (0.60) and migraines (0.66). Those with heart attack showed the highest SF-6D (0.76). The only conditions that were not statistically significant when presence and absence were compared were any substance misuse, alcohol dependence/misuse, heart attack and diabetes. The worst health state profile (i.e. 34555) was the most frequent in participants with any mood disorder.

Impact of mental disorders and chronic physical conditions on the SF-6D

Figure 1 shows the modifying effect of mental disorders and chronic physical conditions when adjusting for sociodemographic characteristics and morbidity. The x-axis shows the decile on which the inference was based. Mood disorders, anxiety disorders and chronic pain were always statistically significant, regardless of the decile used. It was observed that any mood disorder was the condition category that had the greatest impact on the SF-6D score, independently of the decile used in the quantile regression. The trend chart demonstrated that the predictive capacity of

Table 1 Sociodemographic characteristics of the sample

	<i>n</i>	%	SF-6D score Median	Kruskal–Wallis test, <i>P</i>	Proportion reporting full health (111111), % (<i>n</i>)	Most frequent health state profile
Total	3754	100	0.772		7.11 (262)	111111
Gender				<0.001		
Male	1386	37.07	0.818		10.66 (147)	111111
Female	2363	62.93	0.724		5.03 (115)	111111
Age group, years				<0.001		
18–24	182	4.78	0.800		11.19 (19)	111111
25–34	461	12.27	0.800		6.64 (32)	111111
35–49	836	22.18	0.758		6.26 (53)	111111
50–64	1100	29.7	0.741		6.98 (76)	111111
>65	1165	31.07	0.776		7.44 (82)	111111
Marital status				<0.001		
Never married	641	16.99	0.800		7.45 (48)	111111
Married or living with someone	2407	64.23	0.793		8.14 (191)	111111
Previously married	702	18.78	0.695		3.30 (23)	111122
Working status				<0.001		
Paid employment	1290	33.98	0.817		8.03 (105)	111111
Paid employment but on sick leave	435	12.11	0.614		2.36 (10)	111111
Other	2017	53.91	0.746		7.63 (147)	111111
Education				<0.001		
No education	460	12.46	0.727		7.21 (32)	111111
Primary	1833	48.71	0.758		7.02 (124)	111111
Secondary	950	25.69	0.797		7.44 (72)	111111
Higher/university	471	13.14	0.800		7.08 (261)	111111

SF-6D, Short Form-6D.

Table 2 Clinical characteristics of the sample

	<i>n</i>	%	SF-6D score Median	Kruskal-Wallis test, <i>P</i>	Proportion reporting full health (111111), % (<i>n</i>)	Most frequent health state profile
Mental disorders						
Any mood disorder	476	13.42	0.547	<0.001	0.19 (1)	345555
Major depressive disorder	332	9.55	0.527	<0.001	0	345555
Dysthymia	115	3.14	0.603	<0.001	0	111122
Any anxiety disorder	659	18.59	0.660	<0.001	2.65 (17)	111111
Panic disorder	253	7.11	0.606	<0.001	2.55 (7)	111111
Generalised anxiety disorder	129	3.77	0.681	<0.001	2.34 (3)	111133
Social phobia	64	1.9	0.599	<0.001	–	–
Specific phobia	232	6.66	0.698	<0.001	3.34 (7)	111122
Any substance misuse	122	3.19	0.723		3.32 (5)	111111/111131
Alcohol dependence/misuse	81	2.18	0.737		3.34 (5)	111131
Chronic physical conditions						
Chronic pain	2496	66.55	0.723	<0.001	4.51 (108)	111111
Arthritis	1480	39.6	0.681	<0.001	4.01 (54)	111111
Migraines	717	19.33	0.657	<0.001	2.82 (21)	111111/111112
Back pain	1484	39.68	0.669	<0.001	3.20 (44)	111111
Neck pain	1471	39.25	0.675	<0.001	3.78 (53)	111111
Cardiovascular diseases	496	13.28	0.724	<0.001	5.92 (28)	111111
Heart diseases	457	12.24	0.723	<0.001	6.28 (27)	111111
Heart attack	171	4.71	0.755		6.20 (10)	111111
Diabetes	373	10.02	0.738		6.43 (24)	111111
High blood pressure	1075	28.88	0.737	<0.005	6.93 (71)	111111
Respiratory conditions	467	12.36	0.723	<0.001	5.36 (23)	111111
Chronic bronchitis	347	9.25	0.705	<0.001	3.95 (13)	111111
Asthma	227	6.08	0.705	<0.001	5.95 (12)	111111

SF-6D, Short Form-6D.

mood disorders increases along with SF-6D score. That means that the differences in the HRQoL between participants with or without mood disorders is more evident among those with higher SF-6D scores. The IQR regression between extreme deciles (ninth and first) confirmed this. The coefficient of this regression (difference between ninth and first coefficients) was -0.083 (95% CI -0.115 to -0.052 , $P < 0.0001$). This statistical difference was also found between the first (25) and third (75) quartiles (coefficient -0.072 , 95% CI -0.094 to -0.049 , $P < 0.0001$). Chronic pain also had an impact on the SF-6D score but conversely: as the SF-6D score increased, its predictive capability decreased. That is, differences in the extreme IQR regression (between first and ninth decile) showed a difference between coefficients of 0.052 (95% CI 0.015 – 0.061 , $P < 0.0001$). This difference was also found for chronic pain in the IQR regression conducted with first and third quartiles (0.040 , 95% CI 0.034 – 0.071 , $P = 0.002$).

The impact of the other conditions was independent of the decile chosen. In fact, the extreme IQR regressions (between first and ninth decile) did not show any statistical differences for anxiety disorders, cardiovascular diseases, high blood pressure, diabetes or 12-month any substance misuse. When considering the first and third quartiles for the IQR regression, high blood pressure showed a statistically significant trend comparable to that of pain: as SF-6D increased, its predictive capability decreased (difference 0.021 , 95% CI 0.001 – 0.040 , $P = 0.04$). The pseudo R_2 for each quantile regression oscillated between 0.1266 for the quantile regression with the inference based on the ninth decile and 0.2168 for the quantile regression with the inference based on the median. Table 3 shows the complete model with inference based on the median.

Burden of disease in primary care

Table 4 shows the annual QALY losses per 100 000 primary care patients that could be explained by each condition. Chronic pain

was associated with the greatest QALYs loss, followed by mood disorders (5064 and 2634 respectively). Diabetes showed the smallest QALYs loss (250). Quality-adjusted life-year losses for substance use disorders were not calculated as they did not reach statistical significance in the quantile regression with the inference based on the median.

Discussion

Strengths and limitations

One of the strengths of this study is that it has been conducted using a large representative sample of primary care attendees with good external validity. Moreover, to the best of our knowledge, there are few other studies with sufficiently large epidemiological samples in primary care to compare the impact of both chronic physical conditions and mental disorders in annual QALY losses. Another important strength is the statistical strategy used that permitted exploration of the predictive power of the different mental and physical conditions according to different SF-6D values. Additionally, the 36-item Short Form Health Survey (SF-36)²⁰ and the different versions of it have been recently recommended by STAKES as a routine patient-centred outcome measure²¹ and this paper shows the different uses of this kind of measure. Finally, this study was carried out in a Mediterranean country. Previous studies aiming to study the burden of disease have been conducted in Anglo-Saxon or Scandinavian countries and little is known about the burden of diseases in southern European countries. It is well known that the expression of mental disorders differs across cultures,²² so our paper also represents a chance to study how robust previous results on burden are.

Some limitations should be mentioned. First, we used UK tariffs and some cultural bias may be expected. A re-analysis of these data should be carried out when Spanish tariffs are available. Second, we estimated QALYs without adjusting for the years lived with the conditions. Therefore our estimates should be considered

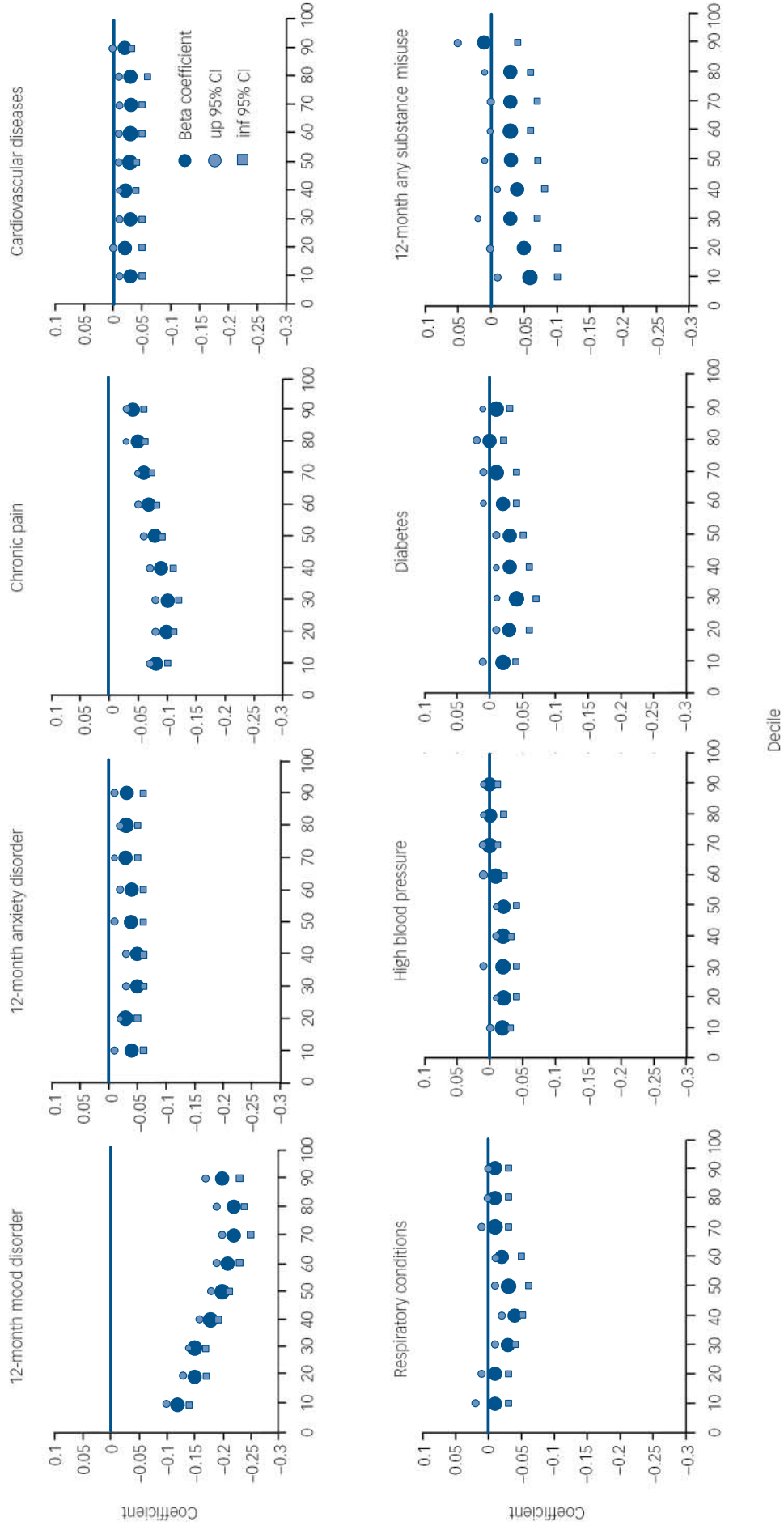


Fig. 1 Impact of mental disorders and chronic physical conditions in the Short Form-6D index, adjusted for sociodemographic characteristics, by percentile (non-parametric interquartile range).

Table 3 Regression model with inference based at the median

	Coefficient	95% CI	Bootstrap, s.e.	P
Presence of 12-month mood disorder	−0.1963	−0.2113 to −0.1813	0.0077	<0.001
Presence of 12-month anxiety disorder	−0.0433	−0.0594 to −0.0273	0.0082	<0.001
Presence of 12-month any substance misuse	−0.0275	−0.0657 to 0.0106	0.0195	0.157
Presence of chronic pain	−0.0761	−0.0894 to −0.0628	0.0068	<0.001
Presence of respiratory conditions	−0.0345	−0.0579 to −0.0111	0.0119	0.004
Presence of cardiovascular diseases	−0.0266	−0.0440 to −0.0091	0.0089	0.003
Presence of high blood pressure	−0.0222	−0.0371 to −0.0072	0.0076	0.004
Presence of diabetes	−0.0250	−0.0479 to −0.0022	0.0117	0.032
Women v. men	−0.0441	−0.0569 to −0.0313	0.0065	<0.001
Age	0.0003	0.0002 to 0.0007	0.0002	0.307
Married or living with someone v. never married	0.0029	−0.0106 to 0.0164	0.0069	0.678
Previously married v. never married	−0.0328	−0.0536 to −0.0120	0.0106	0.002
Primary education v. no education	0.0223	0.0008 to 0.0438	0.0109	0.042
Secondary education v. no education	0.0256	0.0033 to 0.0480	0.0114	0.025
Higher education v. no education	0.0324	0.0072 to 0.0576	0.0128	0.012
Paid employment but on sick leave v. paid employment	−0.1350	−0.1548 to −0.1151	0.0101	<0.001
Other ^a v. paid employment	−0.0107	−0.0261 to 0.0047	0.0079	0.175
Constant	0.8773	0.8457 to 0.9090	0.0162	<0.001

a. Participants who were students, retired, homemakers, disabled, unemployed or on maternity leave.

with caution as there could be a bias. Third, we did not consider the ‘treatment effect’. The vast majority of participants were receiving treatment that may have modified their previous health status. The utility assigned to their health status could be over-estimated because they are receiving some form of care. Fourth, chronic physical conditions were ascertained using a checklist rather than an examination by a physician. However, it should be borne in mind when considering this limitation that checklists have been found to provide useful information about both treated and currently untreated chronic conditions,²³ and they can predict out-patient healthcare use, hospitalisations and mortality.²⁴ Additionally, methods research has shown that self-reporting of chronic physical conditions shows moderate to high agreement with medical records data.²⁵ Fifth, our checklist did not include some serious illnesses such as cancer or neurological disorders that also have a big impact on HRQoL. Although some information about these illnesses was gathered in the open question included at the end of the checklist, the low prevalence of both illnesses and the different methodology used to assess them meant that they were not included in our analyses. We did not consider, as a part of the burden, the family burden and/or the social burden (stigma) that are associated with both physical and mental disorders.

Table 4 Annual losses of quality-adjusted life-years (QALYs) associated with chronic physical conditions and mental disorders

	Prevalence	Marginal effect	Annual loss of QALYs (per 100 000 primary care attenders)
Mood disorders	13.42	−0.1963	2634.35
Anxiety disorders	18.59	−0.0433	804.947
Chronic pain	66.55	−0.0761	5064.455
Cardiovascular diseases	13.28	−0.0266	353.248
Diabetes	10.02	−0.0250	250.5
Respiratory conditions	12.36	−0.0345	426.42
High blood pressure	28.88	−0.0222	641.136

The burden associated with mental disorders could be underestimated as it is well documented that these conditions increase the burden on informal caregivers.²⁶ On the other hand, we have to take into account that mental disorders were assessed considering the previous 12-month period, whereas chronic physical conditions were assessed over the lifetime period. Thus, it is possible that the impact of chronic physical conditions was underestimated, as these conditions are treated more by physicians.

Comparison with previous findings

Our data are similar to those obtained in other studies. However, statistical analyses usually consider parametric approaches making comparisons difficult, as our method has different assumptions. Moreover, most of the studies reviewed considered utilities derived from the EQ-5D. Different studies have shown that utilities obtained could vary according to the instrument used (EQ-5D or SF-6D). Lamers *et al* point out that ‘both discriminated between severity subgroups and captured improvements in health over time. However, the use of EQ-5D resulted in larger health gains and consequent lower cost-utility ratios, especially for the subgroup with the highest severity problems.’²⁷

Consistent with our results, in a study carried out in the general population aiming to measure HRQoL decrement and loss of QALYs associated with pure and comorbid forms of depressive and anxiety disorders and alcohol dependence, Saarni *et al*² found that mood disorders had the worst impact on HRQoL. This was also found in a survey carried out in the general population in Sweden,²⁸ where depression showed the lowest utility (0.38). One study aiming to assess changes in depression utilities before and after treatment showed that baseline depression utility was 0.33.²⁹ After treatment, this utility increased to 0.85 among treatment responders, to 0.72 among those who partially responded and to 0.58 among those who did not respond to treatment. This last value is similar to the one we obtained (0.53), where participants with depression could be in ongoing treatment for their condition or receiving treatment for other conditions if their depression was not detected or treated. Values from Germany for depression utility ranged between 0.56 and

0.64.⁵ Lastly, Revicky & Wood reported utilities for depression (stratifying by severity) derived from the SF-36.³⁰ Utilities varied from 0.55 to 0.63 for moderate depression, from 0.64 to 0.73 for mild depression and from 0.72 to 0.83 for antidepressant maintenance therapy.

It is important to note that the impact of mood disorders in the SF-6D increases as the index does, suggesting that mood disorders are conditions sensitive to small losses in quality of life. This could be explained by the fact that the dimensions comprising the index are very close to the symptoms of depression: role limitation, mental health (feeling downhearted), social limitations and loss of vitality.

With regard to chronic pain we found an overall median utility of 0.72, higher than those previously reported (range 0.52–0.61).³¹ Assessment methods or the different sample used could explain these differences. On the other hand, Brown *et al*, who studied the utility associated with migraine, found a utility of 0.62 (assessed with the Health Utilities Index 3 (HUI3)).³² This value is close to the 0.66 we found.

Similar to our results, a study focusing on respiratory conditions reported utilities ranging from 0.63 (in a sample of individuals with non-controlled asthma) to 0.80 (in individuals whose asthma was controlled).³³ However, this study used the SF-6D derived from the SF-36 and was carried out in a sample in ongoing rehabilitation.

The utility for high blood pressure was 0.74. This value was very similar to that found by a study conducted in the Swedish general population, which reported utilities for high blood pressure ranging from 0.73 to 0.81.³⁴

Regarding diabetes, a Canadian study demonstrated that its utilities oscillated between 0.88 (when it presents without comorbidity) and 0.77 (when it is comorbid with other illness).³⁵ We found similar results: diabetes showed a utility of 0.74.

Contrary to the WHO report,⁹ heart attack did not have a high impact in QALY losses. This could be related to the fact that we did not take into account quantity of years lived with the condition, nor mortality, which could increase the number of QALY losses.

Estimation of QALY losses showed that mood disorders ranked second, behind chronic pain. This may be explained by the high prevalence of the latter condition in our sample. However, we have to take into account that mood disorders showed a five times smaller prevalence than that of pain disorders and that QALYs loss for mood disorders were only half that of pain, highlighting the importance of mood disorders in disease burden. For example, if we compare QALY losses of mood disorders with those of cardiovascular disease, which showed similar prevalence in our sample, QALY losses associated with mood disorders were nearly ten times higher than those associated with chronic cardiovascular conditions. This elevated quantity of QALY losses associated with mood disorders could also be explained by the fact that mood disorders affect all dimensions forming the health profile, and that the worst profile (345555) is more frequent among people with depression.

In conclusion, our findings show that mood disorders are responsible for a large percentage of QALYs lost in Catalan primary care patients, slightly below that of chronic pain. As our data on mental disorders prevalence is very similar to previous reports,³⁶ we think that our results can be generalised to other populations. The considerable expense that depression generates at both the individual and societal level justifies investment in strategies designed to reduce these costs. General practitioners are in a privileged position to detect and treat depression, and every effort should be made to improve training for these professionals.

Anna Fernández, MSc, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu and Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III), Barcelona; **Juan Ángel Bellón Saameño**, PhD, MD, Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III), Barcelona and Centro de Salud El Palo, Unidad de Investigación del Distrito de Atención Primaria de Málaga, Departamento de Medicina Preventiva y Salud Pública, Universidad de Málaga; **Alejandra Pinto-Meza**, PhD, **Juan Vicente Luciano**, PhD, **Jaume Autonell**, MD, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu and Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III) Barcelona; **Diego Palao**, PhD, MD, Centre de Salut Mental, Corporació Sanitària Parc Taulí, Institut Universitari Fundació Parc Taulí-Universitat Autònoma de Barcelona, Sabadell; **Luis Salvador-Carulla**, PhD, MD, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu and Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III), Barcelona; **Javier García Campayo**, PhD, MD, Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III), Barcelona and Hospital Miguel Servet y Universidad de Zaragoza, Aragones Health Science Institute, Zaragoza; **Josep Maria Haro**, PhD, MD, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu and CIBERSAM, Instituto de Salud Carlos III, Barcelona; **Antoni Serrano**, PhD, MD, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu and Red de Investigación en Actividades Preventivas y Promoción de la Salud en Atención Primaria (RedIAPP, Instituto de Salud Carlos III), Barcelona, Spain; and the DASMAPP investigators.

Correspondence: Anna Fernández, MSc, Sant Joan de Déu-SSM, Fundació Sant Joan de Déu, Research and Development Unit, Dr. Antoni Pujadas, 42, 08830 Sant Boi de Llobregat, Barcelona, Spain. Email: afernandez@sjd-ssm.com

First received 28 Oct 2009, final revision 22 Dec 2009, accepted 5 Jan 2010

Funding

This study was funded by the 'Direcció General de Planificació i Avaluació Sanitària – Departament de Salut – Generalitat de Catalunya' (Barcelona, Spain). A.F. and J.V.L. are grateful to the 'Ministerio de Sanidad y Consumo, Instituto de Salud Carlos III' (Red RD06/0018/0017) for a predoctoral and a postdoctoral contract respectively.

References

- Dolan P. The measurement of health-related quality of life for use in resource allocation decisions. In *Health Care. Handbook of Health Economics* (eds AJ Cuyler, PJ Newhouse): 1723–60. Elsevier, 2000.
- Saarni SI, Suvisaari J, Sintonen H, Pirkola S, Koskinen S, Aromaa A, et al. Impact of psychiatric disorders on health-related quality of life: general population survey. *Br J Psychiatry* 2007; **190**: 326–32.
- Brazier JE, Roberts J. The estimation of a preference-based measure of health from the SF-12. *Med Care* 2004; **42**: 851–9.
- Ware Jr J, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996; **34**: 220–33.
- Günther HO, Roick C, Angermeyer MC, König HH. The responsiveness of EQ-5D utility scores in patients with depression: a comparison with instruments measuring quality of life, psychopathology and social functioning. *J Affect Disord* 2008; **105**: 81–91.
- Solberg LI, Maciosek MV, Edwards NM. Primary care intervention to reduce alcohol misuse ranking its health impact and cost effectiveness. *Am J Prev Med* 2008; **34**: 143–52.
- Williams A. Calculating the global burden of disease: time for a strategic reappraisal? *Health Econ* 1999; **8**: 1–8.
- Murray CJL, Lopez AD. *The Global Burden of Disease Series*. Harvard School of Public Health, 1996.
- Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med* 2006; **3**: e442.
- Gold MR, Stevenson D, Fryback DG. HALYs and QALYs and DALYs, Oh My: similarities and differences in summary measures of population health. *Annu Rev Public Health* 2002; **23**: 115–34.
- Salvador-Carulla L, Garrido M, McDaid D, Haro JM. Financing mental health care in Spain: context and critical issues. *Eur Psychiatry* 2006; **20**: 29–44.
- Serrano-Blanco A, Palao DJ, Luciano JV, Pinto-Meza A, Luján L, Fernández A, et al. Prevalence of mental disorders in primary care: results from the diagnosis and treatment of mental disorders in primary care study (DASMAPP). *Soc Psychiatry Psychiatr Epidemiol* 2009; May 19 (Epub ahead of print).
- Gandek B, Ware JE, Aaronson NK, Apolone G, Bjorner JB, Brazier JE, et al. Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. International quality of life assessment. *J Clin Epidemiol* 1998; **51**: 1171–8.

- 14 Vilagut G, Ferrer M, Rajmil L, Rebollo P, Permanyer-Miralda G, Quintana JM, et al. The Spanish version of the Short Form 36 Health Survey: a decade of experience and new developments. *Gac Sanit* 2005; **19**: 135–50.
- 15 First MB, Gibbon M, Spitzer RL, Williams JBW. *User's Guide for the Structured Clinical Interview for DSM-IV Axis I Disorders. Research Version*. Biometrics Research, 1996.
- 16 Sheehan DV, Lecrubier Y, Sheehan H, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry* 1998; **59**: 22–33.
- 17 Ferrando L, Bobes J, Gibert J. *MINI International Neuropsychiatric Interview*. (Spanish version). IAP, 2000 (<http://entomologia.rediris.es/pub/bscw.cgi/d602335/MINI%20Entrevista%20Neuropsiquiatrica%20Internacional.pdf>).
- 18 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (4th edn) (DSM-IV)*. APA, 1994.
- 19 Koenker R. *Quantile Regression*. Cambridge University Press, 2005.
- 20 Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care* 1992; **30**: 473–83.
- 21 Korkeila Jyrki JA. *Measuring Aspects of Mental Health*. National Research and Development Centre for Welfare and Health, 2000.
- 22 Breslau J, Javaras KN, Blacker D, Murphy JM, Normand SL. Differential item functioning between ethnic groups in the epidemiological assessment of depression. *J Nerv Ment Dis* 2008; **196**: 297–306.
- 23 Knight M, Stewart-Brown S, Fletcher L. Estimating health needs: the impact of a checklist of conditions and quality of life measurements on health information derived from community surveys. *J Public Health Med* 2001; **23**: 179–86.
- 24 Fan VS, Au D, Heagerty P, Deyo RA, McDonnell MB, Fihn SD. Validation of case-mix measures derived from self-reports of diagnoses and health. *J Clin Epidemiol* 2002; **55**: 371–80.
- 25 US Department of Health and Human Services. Evaluation of National Health Interview Survey diagnostic reporting. *Vital Health Stat* 2 1994; **120**: 1–116.
- 26 Jungbauer J, Bischkopf J, Angermeyer MC. Stress of family caregivers of psychiatric patients. Developmental trends, concepts and results of research. *Psychiatr Prax* 2002; **28**: 105–14.
- 27 Lamers LM, Bouwmans CAM, van Straten A, Donker MCH, Hakkaart A. Comparison of EQ-5D and SF-6D utilities in mental health patients. *Health Econ* 2006; **15**: 1229–36.
- 28 Burstrom K, Johannesson M, Diderichsen F. Health-related quality of life by disease and socio-economic group in the general population in Sweden. *Health Policy* 2001; **55**: 51–69.
- 29 Sapin C, Fantino B, Nowicki ML, Kind P. Usefulness of EQ-5D in assessing health status in primary care patients with major depressive disorder. *Health Qual Life Outcomes* 2004; **2**: 20.
- 30 Revicki DA, Wood M. Patient-assigned health state utilities for depression-related outcomes: differences by depression severity and antidepressant medications. *J Affect Disord* 1998; **48**: 25–36.
- 31 Ruchlin HS, Insinga RP. A review of health-utility data for osteoarthritis implications for clinical trial-based evaluation. *Pharmacoeconomics* 2008; **26**: 925–35.
- 32 Brown JS, Neumann PJ, Papadopoulos G, Ruoff G, Diamond M, Menzin J. Migraine frequency and health utilities: findings from a multisite survey. *Value Health* 2008; **11**: 315–21.
- 33 Szende A, Svensson K, Stahl A, Meszaros A, Berta GY. Psychometric and utility-based measures of health status of asthmatic patients with different disease control level. *Pharmacoeconomics* 2004; **22**: 537–47.
- 34 Bardage C, Isacson D, Ring L, Bingeferos K. A Swedish population-based study on the relationship between the SF-36 and health utilities to measure health in hypertension. *Blood Press* 2003; **12**: 203–10.
- 35 Maddigan SL, Feeny DH, Johnson JA. Health-related quality of life deficits associated with diabetes and comorbidities in a Canadian National Population Health Survey. *Qual Life Res* 2005; **14**: 1311–20.
- 36 Üstun TB, Sartorius N. *Mental Illness in General Health Care. An International Study*. John Wiley & Sons, 1995.

Psychiatry in the Old Testament

Psalm 38: A man with major depression

George Stein

One of the many purposes the psalms served was to console the sick. These are known as the sickness psalms. There are only six such psalms and two describe quite severe depression (Psalms 38 and 88). Psalm 38 is a good example, but for reasons of space only those verses which describe key depressive symptoms are included here.

6 'I am utterly bowed down and prostrate, all day long I go around mourning' – depressed mood.

8 'I am utterly spent and crushed: I groan because of the tumult in my heart' – despair, anxiety.

10 'My heart throbs, my strength fails me: as for the light of my eyes – it has gone from me' – tachycardia due to anxiety, anergy, anhedonia?

13 'But I am like the deaf I do not hear: like the mute who cannot speak

14 'Truly I am like one who does not hear and in whose mouth there is no retort' – sensory inattention, inability to concentrate, with depressive mutism or psychomotor retardation.

18 'I confess my iniquity; I am sorry for my sin' – guilt.

The person may be experiencing an episode of psychotic depression as additional five verses describe enemies who are plotting his end: 12 'Those who seek my life lay their snares, Those who seek to hurt me speak of ruin, and mediate treachery all day long' – they may be real enemies or conspiracy theories with auditory hallucinations and thoughts of death through murder.

There is probably sufficient depressive symptomatology here to diagnose a DSM-IV major depression (five key symptoms, one of which is depressed mood). Such a combination of symptoms in this psalm may suggest that the author had had major depression himself, as it is unlikely that he would be able to render them so faithfully otherwise.

The British Journal of Psychiatry (2010)
196, 309. doi: 10.1192/bjp.196.4.309