

International research

Patients' beliefs about depression and how they relate to duration of antidepressant treatment. Use of a US measure in a UK primary care population

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ABSTRACT

Background Patients have a wide range of explanations for their depression and it is not known how these beliefs influence subsequent behaviour and hence outcome.

Research question What are patients' beliefs about depression and do they relate to duration of antidepressant treatment?

Design of study Cross-sectional questionnaire survey

Setting A general practice in the South of England

Methods All patients prescribed antidepressant medications over a 1-year period were asked to complete a validated questionnaire on beliefs about depression (PDIQ), a current depression and anxiety score (HADS), a measure of compliance with medication (MARS) and a demographic questionnaire. Results from the PDIQ were analysed by exploratory factor analysis. Multiple regressions were used to determine predictors of belief and whether belief predicted duration of medication.

Results Two-hundred and eight patients (33%) consented to participate. Factor analysis produced a coherent underlying belief structure, similar to results obtained in the US and related to Leventhal's self-regulatory model of illness cognitions. Antidepressant medication was taken for longer by older participants and those with beliefs that antidepressants help, medical illness causes depression, and that depression is chronic. Antidepressant medication was taken for a shorter time by those who were in a stable relationship, or believed herbal remedies or 'clarifying priorities' would help depression. Beliefs accounted for up to 35% of the variability in duration of medication.

Conclusions Beliefs do seem to be related to duration of treatment in this cross-sectional study. Longitudinal research is needed to establish cause and effect.

Keywords: to come?

Introduction

In the UK at any one time approximately one in six adults of working age are found to have a neurotic disorder, mainly depression, or mixed anxiety and depression (point prevalence 26/1000 and 88/1000, respectively).¹ Of those who attend their general practitioner (GP) with this problem, only nine out of every 100 will be referred to specialist services, leaving the large majority to be cared for in primary care. In 1999 mental health problems cost an estimated £32 billion in England, including £12 billion in lost employment and £8 billion in benefits.² Approximately 91 million working days are lost each year as a result of mental health problems, mainly stress, anxiety and depression.³ The number of antidepressant drugs prescribed between June 2000 and June 2005 rose by 36% to 7.3 million items per quarter, and the cost increased by 20% to £91 million per quarter.⁴ Over and above this are considerable personal and family costs.

When antidepressant medications are prescribed, they are often taken for a few weeks or months only, but the risk of relapse is reduced if they are continued for 4 to 6 months after recovery.⁵ In the Hampshire Depression Project, despite guideline-based education for GPs, only a quarter of patients with probable major depression and 15% of those with possible major depression were prescribed the recommended doses for the recommended duration.⁶ In another study, over a 6-month follow-up, 53% of patients had stopped medication and 24% had not told their GP (often because they felt the reason would not be acceptable to the GP).⁷ One study demonstrated that the overall health costs increased for those who discontinued medication within 60 days compared to those who had more than 90 days of therapy.⁸ Mundt showed that for those who continued with medication, 63% had reduced their score on the Hamilton Depression Rating Scale by 50% after 7 months.⁹

Several factors have been linked to lower adherence, including dislike of tablets, lack of social support, fear of stigma, adverse effects, inconvenience, financial cost, guilt, female gender, older and younger age, high parity, low socio-economic group, substance abuse, divorced, minority groups and personality,^{7,8,10} but there has been limited work on beliefs about depression and adherence. Improving adherence to medication might need patients to accept a biomedical model of depression. However, there is no clear evidence that this is a satisfactory model for mild depression of the type commonly seen in primary care. Recent research shows that patients have a wider variety of models of depression and its

causes than professionals,¹¹ but is this important in the eventual outcome?

If beliefs can be measured in a reproducible way using a quantitative format, relationships between beliefs, adherence and outcome could be assessed. For this particular study, the relationship between beliefs and duration of prescribed medication (as a proxy measure of adherence) was addressed. The primary aim of the study was to quantify beliefs about depression among patients in a UK primary care sample and to determine whether there was a significant relationship between beliefs and duration of antidepressant treatment. Beliefs were elicited using a questionnaire that had been shown to be reliable and valid in secondary care in the US, but had not previously been used in a UK primary care population.¹² The secondary aim was to determine whether the UK patients had similar beliefs to US patients with more severe depression.

Methods

The study was a cross-sectional postal questionnaire survey of patients who had been prescribed antidepressant medication over a 1-year period.

Participants

Patients were recruited from one general practice in the south of England (nine GPs and approximately 13 000 registered patients). All patients who had been prescribed antidepressants during the designated year were eligible to participate, but the following exclusions were applied: patients no longer registered at the practice, patients aged under 18 or over 79 years at the time of the study, patients who took antidepressants for non-psychiatric reasons, patients prescribed antidepressants for severe psychiatric illness such as psychotic depression and schizophrenia, any who were terminally ill, those with learning difficulties or other difficulties making it difficult to read, understand and complete the questionnaires themselves, and those whom the GP felt it would be inappropriate to contact at the time for any other reason. Data were also collected from the practice computer on GP diagnosis, age and number of antidepressant prescriptions over the year.

Questionnaires

The participants were sent four self-completion questionnaires, an explanatory letter inviting them

to take part in the study, and a consent form to confirm their agreement to participate. All completed questionnaires were identified by code only.

The following questionnaires were used:

- *The Hospital Anxiety and Depression Scale (HADS)*: a validated scale to assess the likelihood of current depression and/or anxiety¹³
- *The Perception of Depression Questionnaire (PDIQ)*: the US questionnaire recording a patient's perception of their depression. The questionnaire comprises three subsections: 'what contributed to your depression?', 'what helped relieve your depression?' and 'what does depression mean to you?'. Overall participants have to rate 63 statements on a four-point scale¹²
- *a bespoke questionnaire* asking about participants' demographics, social situation (partner, children, work) and a self-report on how long they had taken their antidepressant medication
- *The Medication Adherence Report Scale (MARS)*: a validated five-item questionnaire for measuring medication adherence.¹⁴ The five questions ask how medications are taken and are scored on a five-point scale. Scores are summed and the median score is used to define adherence/non-adherence with medication.

Copies of the questionnaires used are available from the authors.

Statistical analysis

The results were analysed using the statistical package SPSS version 12.¹⁵ The results from the PDIQ were analysed by principal components analysis to determine if the 63 original statements could be reduced to a smaller number of factors that explained the beliefs of the participants. Exploratory analysis was performed, followed by orthogonal varimax rotation. Factors with eigenvalues >1 were retained, and statements with a minimal loading on a factor of greater than 0.4 were considered related to that factor. Factors were named by the lead author, after discussion with other authors, in an attempt to capture as simply as possible the statements related to that factor.

Stepwise multiple linear regression was used to determine predictive variables from the demographic and HADS data for each of the derived belief factors. Addition and removal from the model was set using the significance of the *F* tests, $P \leq 0.05$ for entry and $P > 0.051$ for removal.

Predictive variables for three adherence/duration measures – MARS score, number of prescriptions and self-reported duration – were also determined by multiple regression. A logarithmic transformation

was used on number of prescriptions, which then underwent stepwise linear regression as above. MARS data were initially categorised into 'adherent' or 'non-adherent' using the median value as a cut-off,¹⁴ and self-reported duration was categorised into 6 months or more, or less than 6 months. The resultant variables were analysed by binary logistic regression using the forward stepwise likelihood ratio option in SPSS with *P* values for entry and removal set as above. The initial model included belief variables as potential predictors of adherence/duration, and the subsequent model included belief variables, demographic variables and HADS scores.

Results

A total of 628 questionnaires were mailed to potential participants, of whom 208 (33%) agreed to participate by returning completed forms and consent forms. Responders were aged between 18 and 79 years, and were slightly older than non-responders (mean age 49.2 vs. 45.8 years, respectively, $P = 0.004$). Seventy-five percent of responders were female, which corresponded to the proportion overall (76%). Computer records showed responders had been issued with between 1 and 13 prescriptions for antidepressants during the study year, on average more than non-responders (mean 4.65 and 3.96, respectively, $P = 0.004$). Depression was the most common diagnosis recorded for both groups (63% of responders, 65% of non-responders), although responders were more likely than non-responders to have a dual diagnosis of depression and anxiety (16.6% and 9%, respectively).

Beliefs about depression

Factor analysis of the complete data set from the PDIQ resulted in 18 factors describing 67.7% of variance. The factors were named by the first author (after discussion), in an attempt to summarise the individual statements included in the factor, and are described in Table 1. The first four factors appear to represent: belief about control of the illness (*self-efficacy/controllability*), *internal causes* of depression, chronic *timeline* and belief in *alternative cures*. Factors 5–13 each contribute between 2.7% and 3.6% to the total variance explained, and collectively describe *external causes* of depression such as problems with *relationships*, *lack of exercise*, *grief* and *employment* difficulties. Factors 14–18 account for between 2.1% and 2.6% of variance each, and describe interventions or strategies for dealing with depression

Table 1 UK factors (% variance accounted for) and individual statement loadings

Factor (% variance) Loading	Statement	
1: Self-efficacy, controllability (10%)	Changing how I think of myself ^a	0.78
	Understanding myself better ^a	0.77
	Changing some of my behaviours ^a	0.68
	Having an explanation for my depression ^a	0.63
	Clarifying my priorities in life ^a	0.63
	Improving health or diet ^a	0.61
	Learning to cope with stress ^a	0.59
	I have an opportunity to strengthen my character	0.55
	Developing close relationships ^a	0.52
	Increasing activities ^a	0.51
	Having a confidant/talking to others ^a	0.50
	Improving sleep	0.48
	Increasing/improving relationships with others ^a	0.48
	Letting time heal ^a	0.43
	Relaxation/meditation techniques	0.41
2: Flawed/negative, intrinsic causes (9%)	Personal flaws ^b	0.76
	Being too pessimistic or self-critical	0.70
	Low self-esteem ^b	0.69
	Lack of control over my life	0.69
	Never learning from my mistakes	0.63
	Mistakes of the past ^b	0.58
	My tendency to look at life negatively	0.58
	I need to make changes in my life	0.51
	Trying to hard to do the right thing	0.51
	I am overwhelmed	0.45
	Not enough support or understanding from friends	0.45
	I'm a hopeless case ^b	0.43
	3: Hopeless, chronic timeline (4.9%)	This is just the way I am ^b
I will always be depressed ^b		0.77
Even if I get better, chances are I'll be depressed again ^b		0.72
I'm a hopeless case ^b		0.47
My tendency to look at life negatively		0.40
4: Holistic, alternative cures (4%)	Taking herbal remedies ^c	0.81
	Taking homeopathic/naturopathic remedies ^c	0.77
	Self help books/tapes/workshops	0.50
	Support groups	0.45
	Relaxation/meditation techniques ^c	0.45
	Massage	0.41
5–12: Extrinsic factors		
5: Relationships (3.6%)	Family situation ^d	0.77
	Problems with partner (or not having one) ^d	0.62
	Increasing/improving relationships with others	0.54
	Lack of social support/close friends ^d	0.48
6: Work (3.5%)	Making professional changes	0.76
	Job situation ^d	0.73
	Stress ^d	0.44

Table 1 continued

7: Activity (3.4%)	Not enough physical exercise	0.74
	Exercising more frequently would help	0.59
	Antidepressant medications	-0.46
	Energetic imbalance	0.42
	Increasing activities	0.40
8: Money (3.3%)	Improving my finances ^d	0.76
	Financial problems ^d	0.66
9: Trauma/grief (3.0%)	A traumatic or painful event ^d	0.77
	Personal loss/grief ^d	0.72
	Letting time heal	0.41
10: Sleep (2.9%)	Poor sleep	0.72
	Improving sleep	0.51
11: Spiritual (2.9%)	Spiritual or religious needs not met ^d	0.80
	Using my religious beliefs or spirituality would help	0.74
12: Medical illness (2.8%)	I will be vulnerable to illness ^d	0.74
	Medical illness	0.65
13: chemical/genetic (2.7%)	Chemical imbalance or other biological factors	0.79
	Genetic factors (inherited)	0.66
14: Counselling (2.6%)	Getting psychotherapy/counselling	0.65
	It's just a phase I'm going through	-0.59
15: Time to heal (2.4%)	My depression will get better with time	0.63
	Not enough support or understanding from friends	0.43
16: Antidepressant treatment (2.3%)	Trying to snap out of it by myself	0.74
	Antidepressant medications	-0.38
17: Challenge (2.3%)	I have a new challenge	0.75
18: Acupuncture (2.2%)	Acupuncture will help	0.78

^a Statements also loading on US factor 'self-efficacy (controllability)'.

^b Statements also loading on US factor 'hopeless/flawed (timeline)'.

^c Statements also loading on US factor 'holistic'.

^d Statements also loading on US factor 'externalizing (external causes)'.

such as *psychotherapy*, *time*, *medication* and *acupuncture*. Only one of the original 63 statements did not load on to at least one of these 18 factors: 'I do not understand why I am/was depressed'.

Beliefs and current depression

Two-thirds of all participants had scores on the HADS anxiety subscale (HAD-A) suggesting possible anxiety; 24% had borderline scores (HAD-A, 8–10) and 42% probable significant anxiety (HAD-A, 11+). Current anxiety predicted a belief in *intrinsic causes* of depression, a *chronic timeline*, belief that lack of *activity* and *financial problems* were causes of depression and that solving these would help, and a

belief that *time would heal*. Thirty-two percent of participants had positive depression scores (HAD-D subscale): 20% possible major depression (HAD-D, 8–10) and 12% probable major depression (HAD-D, 11+). Current depression was a predictor of beliefs that *medical illness* and *sleep problems* were causal and that improving sleep would help. Those who were not currently depressed were more likely to believe that depression was *controllable*.

Beliefs and other variables

Younger patients had stronger belief in the *controllability* of their illness, whereas older patients were more likely to believe in *alternative therapies* or *letting*

time heal. Participants who were separated or divorced were more likely to believe *relationship problems* or *financial problems* were a cause, while those who were married believed that *counselling* would help. Those with young children more often blamed *sleep problems*, while those with no children tended to blame *trauma/grief*. *Work* was believed to be the cause for those in employment and those with higher-level qualifications, who were also more likely to endorse *antidepressant therapy*. Those in occupations classed as unskilled were more likely to believe that *relationship problems* caused depression, while those in more professional occupations were more likely to blame *trauma or grief*.

Predictive variables for each belief factor and the amount of variability accounted for within each factor are shown in Table 2.

Adherence/duration of medication

Results suggested that most responders were adherent to antidepressants and had been using antidepressants for a relatively long period. Using the median value of the MARS scale to determine adherence categorised 58% of responders as 'adherent' (score of 24/25 or 25/25). A further 12% scored 23/25 putting them in the 'non-adherent' category. The MARS score was correlated with the number of prescriptions ($r = 0.219$, $P < 0.01$), with the more adherent having a higher number of prescriptions.

Three-quarters (75%) of responders reported they had taken their antidepressant medication for longer than 6 months. Analysis of the computer records showed that 61.6% of responders had received more than four antidepressant prescriptions during the year being studied. These two measures of duration were moderately correlated ($r = 0.467$, $P < 0.001$).

Table 2 Association of UK beliefs with other variables

Belief factors	Predictive variables	% of variability accounted for (r^2)
Self-efficacy, controllability	Depression (–ve); age (younger)	14.0
Flawed/negative, intrinsic causes	Anxiety	11.0
Hopeless, chronic timeline	Anxiety	4.2
Holistic, alternative cures	Age (older)	4.8
Relationship problems, extrinsic causes	Marital state (divorced/separated); occupational group	5.7
Work, extrinsic causes	Employment (employed); qualifications (higher)	14.2
Increased activity	Anxiety	5.3
Financial, extrinsic causes	Anxiety; marital status (divorced/separated)	6.7
Trauma/grief, extrinsic causes	Occupational group; gender (female); children	11.6
Sleep	Depression; children	5.3
Spiritual/religious beliefs	None	n/a
Medical illness	Depression	6.2
Chemical/genetic	None	n/a
Counselling	Marital state (married)	2.4
Time to heal	Anxiety	2.8
Snap out of it	Qualifications	3.6
Challenge	Age	3.8
Acupuncture	None	n/a

Beliefs and adherence

Regression of adherence/duration variables on belief factors revealed that a significant proportion of the predictive 'belief factors' contained a statement on antidepressant use. Analysis was therefore repeated using original data rather than 'belief factors'. This significantly improved the predictive power of the model and is reported in Table 3.

Self-reported antidepressant duration was predicted by beliefs but not by demographic variables or current HADS score. Respondents who believed that antidepressants helped were more likely to have taken tablets for more than 6 months. Those who believed that 'clarifying priorities' was helpful were more likely to have taken tablets for a shorter time.

The number of prescriptions was predicted by beliefs and demographic variables but not by current

depression or anxiety. Again belief in the helpfulness of antidepressants predicted a higher number of prescriptions, along with a belief that depression was a *chronic illness* or was caused by a *medical illness*. Older participants and those who were divorced or separated were also more likely to have a higher number of prescriptions. Fewer prescriptions were written for those who thought herbal remedies would help, or believed that depression would get better with time or that financial problems had caused their depression.

Only a small amount of the variance in the MARS score was predicted by beliefs or by other variables. As these relationships were only just statistically significant ($P = 0.048$ and $P = 0.028$), and due to the high number of variables in the model, this may represent a type 1 error and should therefore be interpreted with caution.

Table 3 Beliefs and adherence

Measure of adherence/ duration	Predictive beliefs	r^2 beliefs, % (n)	All predictive variables	r^2 all variables % (n)
Number of prescriptions	<p><i>More prescriptions:</i></p> <ul style="list-style-type: none"> ● 'antidepressant medications' – help ● 'medical illness' – cause ● 'personal loss/grief' – cause <p><i>Fewer prescriptions:</i></p> <ul style="list-style-type: none"> ● 'developing close relationships' – help ● 'my depression will get better with time' ● 'taking herbal remedies' – help ● 'financial problems' – cause 	28.9 (197)	<p><i>More prescriptions:</i></p> <ul style="list-style-type: none"> ● 'antidepressant medications' – help ● 'I will always be depressed' ● age (older) ● marital status (divorced/separated) ● occupation (unskilled) <p><i>Fewer prescriptions:</i></p> <ul style="list-style-type: none"> ● 'taking herbal remedies' – help ● 'my depression will get better with time' ● 'financial problems' – cause 	40.8 (175)
Self-reported duration of medication	<p><i>Longer duration:</i></p> <ul style="list-style-type: none"> ● 'antidepressant medications' – help <p><i>Shorter duration:</i></p> <ul style="list-style-type: none"> ● 'clarifying my priorities in life' – help 	35.4 (189)	<p><i>Longer duration:</i></p> <ul style="list-style-type: none"> ● 'antidepressant medications' – help <p><i>Shorter duration:</i></p> <ul style="list-style-type: none"> ● 'clarifying my priorities in life' – help 	39.5 (167)
MARS score	<p><i>Less adherent:</i></p> <ul style="list-style-type: none"> ● 'genetic factors' – cause 	2.8(187)	<p><i>Less adherent:</i></p> <ul style="list-style-type: none"> ● employed 	3.9 (164)

Discussion

Main findings

A coherent belief structure was derived from the PDIQ questionnaire in a UK primary care sample, and this showed similarities to the structure previously demonstrated in the US. Beliefs along with some demographic variables were predictive of duration of antidepressant use.

Strengths and limitations of the study

The 33% response rate was low, although with a sample of 208 there were numerically more responses than in most previous quantitative studies of belief about depression.^{12,16–19} Also, in factor analysis the clarity of the factor structure is more important in determining the accuracy of the solution than sample size itself, so the overall number of responders was not a barrier to analysis of the beliefs data.^{20,21} However, the results from this sample cannot be extrapolated to the whole target population as the responders were slightly older and had more prescriptions than non-responders. Also they were from only one practice population. We therefore cannot speculate on the views of non-responders or other primary care populations.

Responders tended to have been taking antidepressants for more than 6 months, but still had relatively high anxiety and depression scores. This suggests that the responders may represent a more chronic cohort of patients. A previous study in the same region of the country, assessing all attenders in general practice, gave a prevalence of borderline or probable depression as 20%,²² as opposed to 32% in this study. The scores for anxiety in this study were even higher, with 42% of participants having probable anxiety, compared to 34% of all attenders in general practice previously.²² All the participants had been started on antidepressant treatment at least 6 months previously, and should therefore have received an adequate length of treatment. However, previous studies have also reported persistence of symptoms despite treatment. Ackermann reported that of those with milder forms of depression, 8% had persistent depression at one year, 10–18% had developed major depression and a further 20% had moderate to severe social difficulty even if they were no longer classified as depressed.²³

Three different measures were used to record responders' use of medication, as measurements can vary according to the type of measure used.²⁴ In addition, multiple measures reduce the chance of making erroneous conclusions from results that are

biased. Both measures of treatment duration have some shortcomings. Self-report of treatment duration will be influenced by patient recall and possibly a desire to over-report duration to 'please the researcher'. The second measure, a simple count of the number of prescriptions in the index year, takes no account of prescribing in the year before or after the study. Both measures of duration however were moderately correlated suggesting they were measuring the same construct. The MARS scale did not correlate with the duration measures, suggesting it was measuring a different concept. It was not associated with beliefs; however, as it had not previously been used to examine adherence to antidepressant medication, it could not be determined whether this was due to the fact that there was no relationship or due to the validity of the measurement tool in this situation.

As this was a cross-sectional study, we cannot determine whether these beliefs existed at the start of the illness or developed later. However cross-sectional studies are a practical way of identifying relationships that warrant further investigation, with longitudinal research to establish cause and effect.

Beliefs about depression

Using the same original beliefs questionnaire, similarities can be seen in the factors derived from a UK primary care population compared to a US population with major depressive disorder.¹² However, the US data resulted in only four factors explaining 51% of the variance: self-efficacy (UK factor 1), hopeless/flawed/ timeline (UK factors 2 and 3), holistic (UK factor 4) and externalising (UK factors 5–13). This discrepancy could be partly due to methodological differences; in the US, factors onto which fewer than six statements loaded at 0.3 or more were excluded, but these were retained in the UK study to represent more thoroughly the data collected. Using exactly the same methodology in the UK would have resulted in six factors explaining 36% of the variance and excluded factor 5 and factors 8–18. The alterations in methodology therefore do not fully explain the differences in the results. It is not known whether either of these solutions would fit the beliefs of other populations. The strongest factor in both studies was 'self-efficacy, controllability' onto which similar statements were loaded, suggesting that this an important type of belief held by patients. The only other quantitative studies that have looked at different populations were also carried out in the US and UK;^{19,25} however, a pre-existing factor structure was used to analyse the UK data, so any underlying difference in belief

structure was not identified. Qualitative studies do suggest there are cultural differences between models of depression,^{26,27} but it is not known at what level this is apparent, and possibly a larger cultural difference than that between the US and UK would be needed to show differences in beliefs.

Psychological theory postulates that an underlying belief system exists, onto which different cultures overlay their particular beliefs. Leventhal's self-regulatory model of illness cognitions suggests there are five underlying cognitive dimensions, which are used internally to understand illness.²⁸ These are identity (symptoms), cause, consequences, timeline, and cure/control. The present results can partially be explained by this model. In the overall analysis, cause (*intrinsic* and *extrinsic* – factors 2 and 5–13), consequences (*hopelessness* versus *challenge* – factors 3 and 17), timeline (factor 3) and cure/control (*self-efficacy*, *alternative therapy*, *counselling*, and *antidepressant medication* – factors 1, 4, 14 and 16) are significant factors. However, even though there were questions on symptoms (energetic imbalance, sleep, low mood) these were not grouped into one factor by these respondents. The Illness Perception Questionnaire (IPQ) was specifically designed to assess illness beliefs using Leventhal's model,²⁹ and although a modified version has been used in depression, the studies have not been large enough to allow for confirmatory or exploratory factor analysis of the modified questionnaire.^{16,18}

Other quantitative work has used different theoretical concepts which are often reflected in the results.^{25,30} Beliefs about cause of symptoms are universally covered in previous studies of depression, but not so Leventhal's other dimensions. It is important to ask whether fundamental beliefs are apparent regardless of the questionnaire. In the few studies that are large enough for factor analysis to be performed, common themes include, 'autonomous/autonomy/self-efficacy'; 'externalisation/interpersonal/ extrinsic/intrinsic' and 'holistic beliefs/beliefs in antidepressants'.^{7,12,25} However, even though the terminology appears similar it could only be ascertained that the meanings were the same if the results were analysed together.

Beliefs and adherence to medication

In the current study, 29% of the variation in the number of prescriptions and 35% of the variation in self-reported duration of antidepressants could be explained by beliefs. Belief in the helpfulness of antidepressant medications was a predictor of both measures even when demographic variables were taken into account. Other variables which predicted increased duration of medication were the belief

that depression was a chronic illness, increasing age, and being divorced or separated. Al-Saffar found good adherence in those who stated they intended to follow medical advice, had a stronger belief that depression was a medical problem, and had less concern that medication was addictive.³¹ Kessing found that younger patients had more positive beliefs about antidepressant medications but this was not related to adherence.³⁰

Shorter duration of medication was predicted by a belief in herbal remedies, a belief that changes needed to be made or priorities clarified, and being married/living with partner. This contradicts previous studies: Manber found that those who were less adherent had a lower score for self-efficacy (i.e. perceived depression as less controllable),¹² and Brown found that those who had poorer adherence to medication were more likely to attribute their depression to interpersonal difficulties.¹⁶ Sullivan found that no beliefs predicted adherence to medication over 8 weeks, but a lower belief in a biological model of depression, along with a greater self-rated health, predicted response to paroxetine.³⁰ In another study Hegel found that beliefs did not predict response to problem-solving treatment of depression in primary care.³¹

So current research does not give a consistent picture of the relevance of beliefs to adherence and outcome of depression, but to date relatively few studies have been reported in this area. The data from this study are unlikely to have resulted in a perfect model. They can be collapsed into factors that have some relation to the factors in the US data, and Leventhal's model and these factors do predict some measures of adherence, but analysis without the factor analysis improves the 'predictive power' of the model. However, there is enough information to suggest that beliefs in depression could have an important influence on adherence to medication, and therefore influence outcome. As the disease burden of depression increases further work in this area is definitely warranted.

Conclusions

A coherent underlying belief structure was derived from the original questionnaire showing similarities to the factor structure found in a previous study in the US and related to Leventhal's illness belief model.²⁸ 'Causes' of depression were divided into internal and external. 'Control' was by self (self-efficacy) or therapy (alternative, antidepressant medication or counselling). The length of time the illness was likely to last, 'timeline', was assessed by

respondents and 'consequences' were classified as either hopeless or (for a few) a challenge.

Beliefs were a predictor of duration of medication, along with demographic variables. A predictive model including both beliefs and demographic data accounted for up to 40% of the variation in antidepressant duration, while beliefs alone accounted for 35%. These results suggest that further longitudinal work in this area could be important to help determine how treatment should be targeted or may lead to the development of interventions to challenge existing beliefs in order to improve medication adherence.

REFERENCES

- Office of National Statistics. *Better or Worse: a longitudinal study of the mental health of adults living in private households in Great Britain*. London: HMSO, 2003.
- Department of Health. *A National Service Framework for Mental Health: modern standards and service models*. London: Department of Health, 1999.
- Mental Health Foundation. *Statistics on Mental Health – fact sheet*. London: Mental Health Foundation, 2003.
- Prescriptions Pricing Authority. *Prescribing Review – Drugs used in Mental Health*. London: Prescription Pricing Authority, 2005. www.ppa.org.uk (accessed 14 June 2007).
- Geddes J, Butler R and Hatcher S. Depressive disorders. In: *Clinical Evidence Concise* (11e). London: BMJ Publishing, 2004, pp. 249–52.
- Kendrick T, Stevens L, Bryant A *et al*. Hampshire Depression Project: changes in the process of care and cost consequences. *British Journal of General Practice* 2001;51:911–13.
- Demyttenaere K, Enzlin P, Dewe W *et al*. Compliance with antidepressants in a primary care setting: Beyond lack of efficacy and adverse effects. *Journal of Clinical Psychiatry* 2001;62 (suppl):30–3.
- Masand PS. Tolerability and adherence issues in antidepressant therapy. *Clinical Therapeutics* 2003; 25:2289–304.
- Mundt JC, Clarke GN, Burroughs D, Brennehan DO and Griest JH. Effectiveness of antidepressant pharmacotherapy: the impact of medication compliance and patient education. *Depression and Anxiety* 2001;13:1–10.
- Cohen NL, Ross EC, Bagby RM, Farvolden P and Kennedy PH. The 5-factor model of personality and antidepressant medication. *Canadian Journal of Psychiatry* 2004;49:106–13.
- Johnston O, Kendrick T, Kumar S *et al*. A qualitative study of practitioners' and patients' understanding of depression in relation to its management: final scientific report to the MRC. 2005.
- Manber R, Chambers AS, Hitt SK *et al*. Patients perception of their depressive illness. *Journal of Psychiatric Research* 2003;37:335–43.
- Zigmond AS and Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica* 1983;67:311–13.
- Horne R, Hankins M. The Medication Adherence Report Scale (MARS): a new measurement tool for eliciting patients' reports of non-adherence. 2006. Ref Type: Unpublished Work
- SPSS for windows [computer program]. Version 12. Chicago: SPSS Inc, 2004.
- Brown C, Dunbar-Jacob J, Palenchar DR *et al*. Primary care patients' personal models for depression: a preliminary investigation. *Family Practice* 2001; 18:314–20.
- Srinivasan J, Cohen NL and Parikh SV. Patient attitudes regarding causes of depression: implications for psychoeducation. *Canadian Journal of Psychiatry* 2003;48:493–5.
- Fortune G, Barrowclough C and Lobban F. Illness representations in depression. *British Journal of Clinical Psychology* 2004;43:347–64.
- Thwaites R, Dagnan D, Huey D and Addis ME. UK standardization for clinical and non-clinical populations. *Psychology and Psychotherapy: Theory, Research and Practice* 2004;77:363–74.
- MacCallum R, Widaman K, Zhang S and Sehee H. Sample size in factor analysis. *Psychological Methods* 1999;4:84–99.
- Hogarty K, Hine C, Kromrey J, Ferron J and Mumford K. The quality of factor solutions in exploratory factor analysis: the influence of sample size, communality, and overdetermination. *Educational and Psychological Measurement* 2005;65: 202–26.
- Ostler K, Thompson C, Kinmouth A-LK *et al*. Influence of socio-economic deprivation on the prevalence and outcome of depression in primary care. *British Journal of Psychiatry* 2001;178:12–17.
- Ackermann R and Williams J. Rational treatment choices for non-major depressions in primary care. *Journal of General Internal Medicine* 2002;17:293–301.
- Garber MC, Nau DP, Erickson SR, Aikens JE and Lawrence JB. The concordance of self-report with other measures of medication adherence: a summary of the literature. *Medical Care* 2004;42:649–52.
- Addis ME, Traux P and Jacobson NS. Why do people think they are depressed?: The Reasons for Depression Questionnaire. *Psychotherapy* 1995;32: 476–83.
- Karasz A. Cultural differences in conceptual models of depression. *Social Science and Medicine* 2005; 60:1625–35.
- Patel V. Explanatory models of mental illness in sub-saharan Africa. *Social Science and Medicine* 1995; 40:1291–8.
- Leventhal H, Mayer D and Nerenz D. The common sense representation of illness danger. In: Rachman S (ed.) *Medical Psychology* vol 2. New York: Pergamon Press, 1980, pp. 7–30.
- Moss-Morris R, Weinman J, Petrie KJ *et al*. The revised illness perception questionnaire (IPQ-R). *Psychology and Health* 2002;17:1–16.

- 30 Sullivan MD, Katon WJ, Russo JE *et al.* Patient beliefs predict response to paroxetine among primary care patients with dysthymia and minor depression. *Journal of the American Board of Family Practice* 2003;16:22–31.
- 31 Al-Saffar N, Deshmukh A, Eid S and Carter P. Health beliefs and drug compliance of depressed patients in Kuwait. *Journal of Social and Administrative Pharmacy* 2003;20:142–50.

ETHICAL APPROVAL

The study received ethical approval from Southampton and South West Hampshire Local Research Ethics Committee.

FUNDING

Wessex Deanery funded the salary of Dr Lynch during the initial stages of the project and through data collection.

CONFLICTS OF INTEREST

None.

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Received ??????

Accepted ??????

