



# The effect of spiritual beliefs on outcome from illness

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## Abstract

We aimed to assess the role of spiritual belief in clinical outcome of patients nine months after hospital admission. Two hundred and fifty patients admitted to a London teaching hospital were recruited and followed up for nine months. Outcome measures were clinical status as recorded in the outpatient records and patients' self reported health status and beliefs. A hundred and ninety-seven (79%) patients professed some form of spiritual belief, whether or not they engaged in a religious activity. Strength of belief was lower in patients who were in a more serious clinical state on admission ( $F=3.099$ , d.f. = 2 and 192,  $p=0.05$ ). Case note information was available nine months later for 234 patients (94%) and contained useful information for judging clinical outcome in 189 (76%). Patients with stronger spiritual beliefs were 2.3 times more likely (CI = 1.1–5.1,  $p=0.033$ ) to remain the same or deteriorate clinically nine months later. Other predictors of poor outcome were male gender and sleep disturbance at time of admission to hospital. We conclude that a stronger spiritual belief is an independent predictor of poor outcome at nine months in patients admitted to two acute services of a London hospital. It is more predictive of outcome than physical state assessed by clinicians, or self-reported psychological state, at admission. © 1999 Elsevier Science Ltd. All rights reserved.

*Keywords:* Health; Religion; Psychology; Cardiology; Gynaecology; Prospective study

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## Background

Despite claims that religious or spiritual belief is conducive to better health (Levin and Vanderpool, 1987), spiritual beliefs are rarely considered in psychological or medical publications (Larson et al., 1986; Craigie et al., 1988). Usually only the presence or absence of religious practice is considered (Sherrill and Larson, 1988; Pressman et al., 1990) and most work

has concentrated on hospice patients (Reed, 1987; Kirschling and Pittman, 1989). Studies of religious belief and illness have been limited by a lack of experimental methods, the use of inadequate sampling techniques and a lack of comparison groups (Lea, 1982). Many have relied simply on measures such as denomination and frequency of religious observance, which are inadequate measures of a person's strength of belief (Levin and Vanderpool, 1987). Furthermore, communal religious observance may result in the sharing of strong social relationships as well as a common value system. We agree with others that it is important to distinguish social factors involved in observance from the more personal role of spiritual belief itself (Chatters and Levin, 1992).

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A task force set up by the American Psychiatric Association to examine psychiatric treatments, reported that religious practices were important coping mechanisms for patients hospitalised with physical illness (Whitehead and Stout, 1989). Research is needed to examine such claims. The term religion, however, excludes peoples' more general spiritual beliefs that may not fit with the teaching of any organised religious group. In an earlier study we examined whether the spiritual beliefs of patients admitted to hospital with acute physical illness could be studied empirically (King et al., 1994). We distinguished spiritual belief from religious practice in order to elucidate the role of belief, a relatively neglected area in this field of research to date. Thus, we agreed upon the following definitions (Speck, 1988; King et al., 1995): *Religion* pertains to the outward practice of a spiritual understanding and/or the framework for a system of beliefs, values, codes of conduct and rituals. It usually involves some form of communal religious observance. The term *spiritual* refers more broadly to a person's belief in a power apart from their own existence. It is the sense of relationship or connection with a power or force in the universe that transcends the present context of reality. It is more than a search for meaning or a sense of unity with others. Some people may use the word God, others may be less specific. Strength of belief in this power can, however, be regarded as distinct from any concept held about the precise nature of that power. We perceived any religious practice as one indication of strength of belief without judgement as to the fundamental features of that religion.

In our previous research, we found that the strength of a patient's spiritual belief was associated with a poor medical outcome (King et al., 1994). Those patients with stronger spiritual beliefs were more likely to remain unchanged or deteriorate in their medical status six months later. Methodological weaknesses in that study made the results difficult to interpret. In particular, a number of possible confounders of the association between spiritual belief and medical outcome were not measured. No assessment of the severity of illness was made at admission, patients did not record the impact of their illness on daily functioning, a range of diagnostic groups were included and the interview to measure religious and spiritual belief had not been standardised.

We report on a further study in which these problems have been addressed. Our aim was to test the hypothesis arising from our earlier work that strength of spiritual belief predicted a poorer clinical outcome for patients nine months after hospital admission.

## Design

We asked patients admitted consecutively to the cardiology and gynaecology services of an inner London teaching hospital to take part. We chose these services in order to reduce the range of diagnoses of patients taking part and yet ensure a wide age range and an equal balance of gender. The nursing staff advised us on patients too critically ill to participate. The coronary care unit was not involved. A.T. asked all patients to take part within one week of admission to the ward. The medical and nursing staff rated the severity of illness on a four-point scale for all patients before the interview.

The Ethical Practices Subcommittee of the Royal Free Hampstead National Health Service Trust approved the study design. After collecting demographic data, A.T. undertook the assessment of each patient using the following interview and questionnaires:

1. The Royal Free Interview for Religious and Spiritual Beliefs (King et al., 1995). In constructing the interview we used the definitions of religion and spiritual presented earlier. In addition we used the term *philosophical* belief to mean a search for an existential meaning in a particular life experience, without reference to any external power or being. The interview contains a spiritual scale that sums answers to visual analogue questions on the strength with which a spiritual belief is held. Scores are normally distributed, high scores indicating that respondents hold strongly to their beliefs and that these beliefs have a major role in their lives. The scale has high validity (high scores correlate with religious observance) and internal and test-retest reliability ( $\alpha$  0.81; intraclass correlation of 0.95) (King et al., 1995).
2. The General Health Questionnaire (Goldberg, 1970). This standardised scale is widely used as a screening measure for psychiatric disorder.
3. The Nottingham Health Profile (Hunt et al., 1981). This standardised quality of life measure rates the impact of illness on patients' lives.
4. Social Function Questionnaire (Tyrer, 1990). This questionnaire measures social function for the previous two weeks. Scores of up to three are possible on each question; higher scores indicate poor social function.

Nine months after recruitment, we asked patients to complete a postal version of the Royal Free Interview and questionnaires 2 and 3. We wrote at least three times in order to contact patients. Where possible, nonresponders were also contacted by telephone.

At follow-up we examined the hospital records of all

patients to assess clinical progress since admission. The assessment was made jointly by two raters (M.K. and P.S.) blind to the type of belief held by the patients or their psychological or social status. Outcome was assessed as improved or completely well, no change, worse clinical state or death.

*Analysis*

We analysed the data using the Statistical Package for the Social Sciences, Version 6.0. Bivariate analyses were conducted using the  $\chi^2$  statistic for categorical data and Student's *t*-test and the Mann–Whitney *U* statistic for continuous data. We used analysis of variance to examine associations with spiritual belief. Predictors of clinical outcome, significant at the  $p < 0.2$  level on bivariate analysis were examined using multiple logistic regression. Ninety-five percent confidence intervals are reported where appropriate.

**Results**

*Admission*

*Response rates*

One hundred and ninety-four patients with cardiac disease were admitted during the study, of whom 125 eventually took part (Fig. 1). One hundred and seventy-six patients were admitted to the gynaecology service during the study period of whom 126 took part Fig. 1. On assessment of the records at follow-up one patient was found not to have a gynaecological problem and was removed. Thus, data on 125 gynaecology patients were analysed. For ethical reasons we could not collect data on people refusing to take part. Thus, we could not compare their demographic and illness variables with those who took part.

*Patient characteristics*

Men predominated in the cardiology group (Table 1). The gynaecology patients were younger (mean diff = 26.8 years, CI = 23.3–30.2 years, *t* (unequal variances) = 15.36, d.f. = 233.54,  $p < 0.0005$ ) and more likely to be employed outside the home (OR = 1.85, CI = 1.1–3.0,  $\chi^2 = 5.18$ , d.f. = 1,  $p = 0.02$ ) than the cardiology patients. Patients in the cardiology group were also more likely to be assessed as seriously ill by the ward staff ( $\chi^2 = 16.9$ , d.f. = 3,  $p = 0.0008$ ).

*Nature of beliefs*

One hundred cardiology (80%) and 97 gynaecology patients (78%) professed some form of spiritual belief, whether or not they engaged in religious activity (Table 2). Patients in the lower social classes (III non-manual to V) more often reported a spiritual or reli-

gious, and less often a philosophical, world view (OR = 2.4, CI = 1.1–5.5,  $\chi^2 = 4.87$ , d.f. = 1,  $p = 0.03$ ). There was no difference in belief with gender.

*Strength of spiritual beliefs*

Mean scores on the spiritual scale (described above) were similar in the cardiology and gynaecology patients (Table 2) and reflected scores found in the general population (King et al., 1995). Strength of belief was lower in patients who were in a more serious clinical state on admission. Mean scores on the spiritual scale were 29.9 (S.D. 11.6) for nonacute admissions, 27.3 (S.D. 10.5) for moderately serious admissions and 24.1 (S.D. 12.8) for serious and very serious conditions (simple factorial ANOVA,  $F = 3.099$ , d.f. = 2 and 192,  $p = 0.05$ ).

*Psychological and social status*

The distributions of scores on the General Health Questionnaire were skewed with medians of 2.0 (mean 3.1, S.D. 3.2) and 3.0 (mean 3.5, S.D. 3.4) for the car-

<i>Cardiology</i>		<i>Gynaecology</i>
<b>194</b>	<b>ADMITTED</b>	<b>176</b>
3	Died before interviewed	0
22	Discharged before interview	20
6	Too ill to approach	2
17	Too ill to finish interview	18
9	Could not read English	3
0	Deaf	1
12	Refused to take part	6
0	Found to have non-gynaecological problem at follow-up	1
<b>125</b>	<b>PARTICIPATED AT BASELINE</b>	<b>125</b>
9	Died	2
6	Too ill to complete questionnaire	3
2	Moved with no contact address	7
4	Refused	2
31	Did not respond to three attempts at contact	40
<b>74</b>	<b>REPLIED TO FOLLOW-UP</b>	<b>71</b>

Fig. 1. Pattern of response to the study.

Table 1  
Patient characteristics<sup>a</sup>

		Cardiology group	Gynaecology group
Mean age (S.D.)		65.7 (11.9)	38.9 (15.4)
Gender		88 men, 37 women	125 women
Civil status	single	11 (9%)	33 (26%)
	married	82 (66%)	64 (51%)
	div/sep	9 (7%)	7 (6%)
	widowed	21 (17%)	10 (8%)
	cohabiting	2 (2%)	11 (9%)
Employment	employed	53 (42%)	72 (58%)
Ethnicity	white	116 (93%)	92 (74%)
Social Class	I	17 (14%)	10 (8%)
	II	37 (30%)	49 (39%)
	IIINM	16 (13%)	40 (32%)
	IIIM	36 (29%)	8 (6%)
	IV	15 (12%)	13 (10%)
	V	4 (3%)	5 (5%)
Clinical status <sup>b</sup>	nonacute	43 (34%)	67 (54%)
	moderate	50 (40%)	47 (38%)
	serious	28 (22%)	10 (8%)
	v. serious/life threat	3 (3%)	0

<sup>a</sup> IIINM means social class III nonmanual and IIIM social class III manual.

<sup>b</sup> Serious could include some threat to life one case in the gynaecology group was not assessed.

diology and gynaecology groups respectively. This difference was not statistically significant. Seventy-four (60%) cardiology and 73 (58%) gynaecology patients scored two or more, indicating possible emotional distress. Mean scores on the Social Function Questionnaire were 4.3 (S.D. 4.0) for the cardiology and 5.2 (S.D. 4.2) for the gynaecology patients. These scores indicated good social function for two weeks before admission.

#### Impact of illness

Part 1 of the Nottingham Health Profile has six subscales relating to factors such as energy, mobility and sleep. Cardiology patients recorded higher median scores than gynaecology patients on the subscales energy (median 39.2 cf. 24.0, Mann–Whitney

$U=6621.0$ ,  $p=0.04$ ) and mobility (median 11.5 cf. 0.0, Mann–Whitney  $U=6313.5$ ,  $p=0.007$ ). In the cardiology group, older patients (over 65) scored more highly than younger patients on the energy (median diff = 36.8, Mann–Whitney  $U=1555.5$ ,  $p=0.042$ ), pain (median diff = 11.2, Mann–Whitney  $U=1379.5$ ,  $p=0.04$ ) and mobility (median diff = 7.8, Mann–Whitney  $U=1255.5$ ,  $p=0.0005$ ) subscales of the Nottingham Health Profile.

Scores were closely associated with clinical status assessed by ward staff on admission (Table 3).

#### Relationship between type of belief and health status

The type of belief (for example spiritual or philosophical) was not associated with scores on the General Health Questionnaire or Social Function

Table 2  
Beliefs

		Cardiology group	Gynaecology group
Belief systems	religious and spiritual	77 (62)	67 (54)
	spiritual only	23 (18)	30 (24)
	philosophical	18 (14)	11 (9)
	no belief	7 (6)	17 (13)
Mean spiritual scale score		27.2 (S.D. 12.9, range 0–50)	28.4 (S.D. 10.3, range 4–50)
Religion <sup>a</sup>	Christian	52 (68)	48 (72)
	other faith	25 (32)	19 (28)

<sup>a</sup> CVS group,  $n=77$ , gynae group,  $n=67$ . Numbers in parenthesis are percentages, except where otherwise indicated.

Table 3  
Nottingham Health Profile and clinical status at admission

	Nonacute	Moderately ill	Serious or very serious
<i>Nottingham Health Profile subscale score</i>			
Energy <sup>a</sup>	12.0	36.8	63.2
Pain <sup>b</sup>	0	2.9	15.8
Emotional reactions <sup>c</sup>	9.8	13.9	23.7
Sleep <sup>d</sup>	12.6	22.4	39.8
Social	0	0	0
Mobility <sup>e</sup>	0	10.6	35.4

<sup>a</sup> Kruskal–Wallis one-way ANOVA,  $\chi^2 = 19.34$ ,  $df = 2$ ,  $p = 0.0001$ .

<sup>b</sup> Kruskal–Wallis one-way ANOVA,  $\chi^2 = 11.69$ ,  $df = 2$ ,  $p = 0.0029$ .

<sup>c</sup> Kruskal–Wallis one-way ANOVA,  $\chi^2 = 6.63$ ,  $df = 2$ ,  $p = 0.036$ .

<sup>d</sup> Kruskal–Wallis one-way ANOVA,  $\chi^2 = 16.61$ ,  $df = 2$ ,  $p = 0.002$ .

<sup>e</sup> Kruskal–Wallis one-way ANOVA,  $\chi^2 = 32.48$ ,  $df = 2$ ,  $p = 0.0000$ .

Questionnaire. Cardiology patients with no beliefs were more likely than the other three groups to report impairment on the energy subscale of the Nottingham Health Profile (Kruskal–Wallis one-way ANOVA,  $\chi^2 = 7.82$ ,  $d.f. = 3$ ,  $p = 0.049$ ).

#### Follow-up

##### Response rates

Seventy-four (59%) cardiology and 71 (57%) gynaecology patients replied to the follow-up questionnaire (figure). Those successfully followed up did not differ from the remainder in age, gender, social class, outcome as derived from the medical case-notes, psychological status at entry on the General Health Questionnaire or the strength of their spiritual beliefs. Patients who were more seriously ill at admission tended to default from follow-up (response rate: nonacute 62%, moderate 59%, serious and very seriously ill 44%,  $p = 0.13$ ).

We could not find the case notes of 16 subjects, 13 of whom were gynaecology patients. We could not assess longer term outcome in a further 45 people whose doctor did not consider follow-up necessary,

had failed to attend for follow-up clinic appointments or who were managed in their local service after a tertiary referral to the Royal Free Hospital. Thirty-eight of these were cardiology patients (diff = 25%,  $CI = 16–34$ ,  $\chi^2 = 23.3$ ,  $d.f. = 1$ ,  $p = 0.00000$ ).

##### Clinical outcome

For those where case note information was available, gynaecology were more likely than cardiology patients to have improved at outcome (OR = 2.6,  $CI = 1.4$  to  $4.8$ ,  $\chi^2 = 10.0$ ,  $d.f. = 1$ ,  $p = 0.002$ ) (Table 4). Only the pain subscale score on part 1 of the Nottingham Health Profile at follow-up differed significantly between patients with a good outcome and the remainder (Mann–Whitney  $U = 889.0$ ,  $p = 0.006$ ).

##### Outcomes in belief and psychological status

Strength of spiritual belief had declined by the time of follow-up. The mean fall was 2.42 (paired  $t = 2.43$ ,  $d.f. = 48$ ,  $p = 0.024$ ) in the cardiology group and 3.7 ( $CI = 1.2–6.2$ ,  $t = 2.99$ ,  $d.f. = 45$ ,  $p = 0.004$ ) in the gynaecology group. Although the fall in spiritual belief was greatest in patients with a poor clinical outcome

Table 4  
Outcome<sup>a</sup>

		Cardiology group, $n = 125$	Gynaecology group, $n = 125$
Clinical status at follow-up (case-notes)	improved	42 (34)	76 (61)
	no change	31 (25)	23 (18)
	worse	5 (4)	4 (3)
	died	6 (5)	2 (2)
	no FU recorded	38 (30)	7 (6)
	notes missing	3 (2)	13 (10)

<sup>a</sup> Numbers in parenthesis are percentages.

Table 5  
Baseline strength of spiritual belief and clinical outcome<sup>a</sup>

Outcome at 9 months	Mean score on spiritual scale at baseline	Standard deviation
Improved (93)	27.6	11.4
No change (43)	28.4	11.7
Worse (9)	33.3	11.0
Died (5)	37.8	9.2

<sup>a</sup> Only patients with spiritual beliefs for whom outcome was known are included ( $n=150$ ). Number of patients in parenthesis. Simple factorial ANOVA,  $F=1.84$ ,  $df=3$  and  $146$ ,  $p=0.1$ .

(mean fall 5.0) compared to those who had a good outcome (mean fall 3.5), this was not significant.

Psychological distress was less prevalent at follow-up. For the 139 patients who completed the GHQ at entry and follow-up, the proportion scoring 2 or more fell from 55% ( $n=77$ ) to 39% ( $n=54$ ) ( $\chi^2=7.64$ ,  $p=0.006$ ).

#### Prediction of outcome

To test our hypothesis we first examined strength of spiritual belief against outcome where it was known (Table 5). There was a trend for higher strength of spiritual belief at baseline in patients who did poorly clinically by the time of follow-up. We then examined a number of other demographic, illness, psychological and social variables which we considered likely con-

founders in any association between spiritual belief and outcome (Table 6). To do so, we dichotomised the case note data at follow-up into 'improved' versus 'unchanged, worse or died' for use as the dependent variable. Diagnostic category (cardiology versus gynaecology) was included as a predictor of outcome. We excluded patients for whom no subsequent clinical contact was recorded or the notes were missing. Patients with stronger spiritual beliefs (those scoring above the mean on the spiritual scale) were 2.2 times more likely to have a poorer outcome Table 6. Male gender, older age, a cardiac diagnosis, GHQ caseness and higher Nottingham Health Profile sleep and pain subscale scores were also predictive of outcome at the 5% level of significance Table 6. As there were a large number of potential predictor variables, only those that

Table 6  
Predictors of clinical outcome as derived from case-notes (OR means odds ratio; CI = 95% confidence intervals)

Predictor variable	OR for poor outcome	CI of OR	P value	Adjusted OR for poor outcome	CI of OR
Above mean age (52 yr)	2.4	1.3–4.3	0.005	1.3	0.4–3.6
Men	<b>2.9</b>	<b>1.6–5.5</b>	<b>0.001</b>	<b>3.4</b>	<b>1.03–11.4</b>
Lower social class <sup>a</sup>	1.5	0.8–2.9	0.167	1.5	0.6–3.5
White ethnic group	1.6	0.7–3.5	0.278		
Cardiology patients	2.6	1.4–4.8	0.002	0.7	0.2–2.7
Ward assessment:	1.4	0.8–2.6	0.260		
<i>Moderate through life threatening illness</i>					
Social function <sup>d</sup>	1.5	0.8–2.8	0.171		
GHQ case	2.0	1.0–3.7	0.036	1.0	0.4–2.4
High spiritual belief <sup>c</sup>	<b>2.2</b>	<b>1.1–4.2</b>	<b>0.026</b>	<b>2.3</b>	<b>1.1–5.1</b>
NHP <sup>b</sup> Mobility score	1.6	0.9–2.8	0.140	1.1	0.5–2.8
NHP Social score	1.0	0.5–1.9	0.978		
NHP Energy score	1.2	0.6–2.1	0.631		
NHP Sleep score	2.9	1.4–5.9	0.004	2.7	0.9–7.9
NHP Emotion score	1.9	0.97–3.7	0.057	0.9	0.3–2.5
NHP Pain score	1.8	1.0–3.4	0.046	1.8	0.8–4.3

<sup>a</sup> Classes III manual, VI and V.

<sup>b</sup> Any score above zero on each NHP subscale.

<sup>c</sup> Scores on spiritual scale dichotomised at the mean.

<sup>d</sup> Social function questionnaire dichotomised at median.

reached a level of significance of  $p < 0.2$  on bivariate testing, were adjusted for each other in a multiple logistic regression. As predictors may contribute to a multiple regression model in unforeseen ways, the level of  $p < 0.2$ , was chosen to be fairly inclusive (Altman, 1991). One hundred and forty-four patients (of the 189 for whom follow-up information was available) professed a spiritual belief and were included in the analysis. Only high spiritual belief (odds ratio 2.3) and male gender (odds ratio 3.4) remained as independent predictors. The sleep subscale score on the Nottingham Health Profile fell just short of the 5% level of significance Table 6.

We repeated the logistic regression making different assumptions about the 45 patients whose outcome was not recorded in their notes (this did not include the 16 with missing notes). In the first regression we assumed that these patients was unchanged, worse or deceased. Entering the same predictor variables into the logistic regression revealed no significant predictors of outcome. When outcome in this group was assigned as improved or completely better, spiritual belief (OR 2.5, CI = 1.2 to 5.2) and male gender (OR = 3.5, CI = 1.1 to 10.9) were significant predictors of poor outcome.

## Discussion

A stronger spiritual belief appears to be an independent predictor of poorer clinical outcome at nine months in patients admitted to the cardiology and gynaecology services at this hospital. This confirms our earlier finding that patients with stronger spiritual beliefs do less well clinically than those who adhere less strongly (King et al., 1994). Male patients and those who reported sleep disturbance at admission also tended to do poorly, independently of diagnosis or age. Psychological distress and clinical state at admission did not predict outcome.

There are important limitations to our study. Although we obtained useful information from the case records on 188 (75%) patients, only 145 (58%) could be followed up in person. One hundred and ninety-seven patients (79%) professed to have a spiritual belief. Although this compares with other populations (King et al., 1995) in which this interview has been used, low numbers eventually limited the power of some of our comparisons. There is no satisfactory way to deal with missing case note data. Following the advice of Altman (1991) for randomised clinical trials, we analysed outcome assuming all missing cases had a poor outcome or all had a good outcome. Neither extreme is likely to be true; much of the missing data concerned cardiology patients investigated at the Royal Free Hospital and who were considered well enough thereafter to be cared for by their local service.

Assuming all missing cases recovered strengthens our finding regarding spiritual belief while assuming the opposite removes all predictors of outcome. The truth is likely to lie somewhere in between.

A further limitation is the reliability of case note data to measure outcome. There is no reason to suppose, however, that the reliability of these data would vary with the nature of patients' spiritual beliefs. By reviewing the case notes blind to each patient's belief status, restricting the categories into which patients were placed (improved, unchanged, worse and died) and by adjudicating between two raters some of the limitation was overcome. It would have been desirable to have carried out a structured assessment of patients in person at follow-up but resources did not allow this. The Nottingham Health Profile at follow-up was an alternative. Missing data, however, was even more of a problem with this questionnaire. The floor effect of the Profile also limits its utility as a measure of change. Patients with less severe ailments may affirm few statements and it becomes difficult to detect improvement.

There are several possible reasons why people with stronger spiritual beliefs appear to do less well clinically. People who are seriously ill might be expected to find their faith more salient than others with less severe conditions. The severity of their illness subsequently leads to a poorer outcome. Findings at baseline, however, do not support this explanation. The more seriously ill patients had a significantly lower strength of belief on admission. A second possibility is that people with strongly held spiritual beliefs might be more vulnerable in some physical or psychological sense and hence do less well over time. This explanation is also not upheld by our data. Patients with strongly held spiritual beliefs were indistinguishable at admission from those with weaker beliefs in terms of gender, social class or age, psychological or social function or the impact of illness on their daily lives. A third explanation is that some patients with stronger spiritual beliefs have a longer term view of existence and conceive of an after life. They may make less struggle to recover. We doubt that this is plausible as only a minority of these patients were gravely ill and at risk of dying. A fourth possibility is that people with stronger spiritual beliefs report more symptoms to doctors. In rating the notes we were guided by the doctor's view of the patient's condition and the symptoms reported at follow-up. If patients with high spiritual beliefs are less satisfied with care and more likely to complain about their state, this might confound our estimate of their recovery compared to others.

To our knowledge there have been at least two other studies of religious and spiritual factors in cardiology patients. Croog and Levine (1972) reported that heart patients did not draw closer to their religion as a result of their illness. However, strength of belief was not

assessed and patients' religious activities were not correlated with outcome from their illness. Byrd (1988) conducted a randomised controlled trial of intercessory prayer for patients admitted to a coronary care unit. Although patients prayed for by Christians outside the hospital needed less ventilatory assistance, antibiotics and diuretics, little account was taken of the patients' own beliefs.

Despite the weakness of much past research there is now an accumulation of evidence suggesting that there is better health and less morbidity and mortality among behaviourally strict religions such as Mormons and Seventh Day Adventists (Levin, 1994). Durkheim (1951) was the first to propose that embeddedness within a religious community serves to regulate members' behaviour in ways that facilitate good health, positive family and interpersonal relationships, ethical work practices and financial dealings. There may be other explanations, however, such as heredity, psychodynamics of belief systems or superempirical forces (Levin, 1994). There is also evidence that the greater the religiousness, the better the health (Levin and Vanderpool, 1987). Much of the work on the intensity of spiritual belief, however, has been based on inadequate or poorly standardised measures which focus on the Judaeo-Christian tradition.

Patients coping with physical illness and hospitalisation often rely on religious beliefs and practices (Whitehead and Stout, 1989; Waldfogel and Wolpe, 1993). Although our results must be regarded as preliminary, our finding that strength of spiritual belief is more predictive of outcome than physical state assessed by clinicians, or self-reported psychological state, at admission, suggests that spiritual beliefs are a factor that cannot continue to be ignored in outcome research.

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