Clinical Staff's Attributions About Diabetes: Scale-Development and Staff vs. Patient Comparisons

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Clinical staff's attributions about diabetes management were measured using newly developed scales. Eighty-five physicians and nurses provided data to investigate the psychometric properties of the scales and to examine the patterns of attributions made. Alpha coefficients for the 7 six-item scales were satisfactory, ranging from .51 to .73. A comparison between attributions for positive and negative outcomes of diabetes management produced examples of self-serving bias. Comparisons were made with data from 286 insulin-dependent diabetes patients. Staff tended to rate patients as having less personal control over positive outcomes ($t = 2.94$; $df = 338$; $p < .01$) and tended to emphasize chance to a greater extent than did the patients ($t = -4.32$; $df = 338$; $p < .001$). There was a tendency for staff to rate negative outcomes as being more foreseeable by the patients than the patients did themselves ($t = -3.11$; $df = 346$; $p < .01$). Both patients and staff demonstrated bias towards dispositional attributions. The implications of between and within group differences in attribution patterns are discussed.

The importance of patients' beliefs and attitudes and the extent to which these may influence patients' health behavior has been increasingly recognized. Although many researchers have acknowledged the possible influence of psychological variables on medical outcomes, it seems that most have assumed that health professionals, be they physicians, nurses, or paramedical staff, hold a homogeneous set of attitudes and beliefs regarding patients' health care. Although this assumption is not made explicit there have been few attempts to identify health workers' attitudes, or to acknowledge that any discrepancy between those attitudes held by health professionals and those held by patients may actually affect patients' subsequent health behavior. There is an increasing recognition of the importance of measuring the beliefs of health professionals (Marteau, & Baum, 1984; Rodin, 1978; Weinberger, Cohen, & Mazzuca, 1984). We have elsewhere reported the development of a series of situation-specific scales to investigate patients' perceptions of control over their diabetes (Bradley, Brewin, Gamsu, & Moses, 1984). These scales were found to be useful in understanding patients' choice of treatment regimen, individual differences in the efficacy of treatment, and the occurrence of the life-threatening complication of diabetic ketoacidosis (Bradley, Gamsu, Moses, Knight, Boulton, Drury, & Ward, 1984a; Bradley, Gamsu, Knight, Boulton, & Ward, 1986). During the course of this work it became apparent that clinical staff's attitudes and beliefs about their patients'

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FIGURE 2
Content and Format of Scales to Measure Staff's Perceived Control of Diabetes

Imagine that a typical patient in your clinic has recently experienced a hypo.

Write down the single most likely cause of the hypo in the space below.

_____

_____

Now rate this cause on the following scales:

1. To what extent was the cause due to something about the patient?

Totally due to the patient	6	5	4	3	2	1	0	Not at all due to the patient

2. To what extent was the cause due to the treatment recommended by you?

Totally due to treatment recommended	6	5	4	3	2	1	0	Not at all due to treatment recommended

3. To what extent was the cause something to do with other people or circumstances?

Totally due to other people or circumstances	6	5	4	3	2	1	0	Not at all due to other people or circumstances

4. To what extent was the cause due to chance?

Totally due to chance	6	5	4	3	2	1	0	Not at all due to chance

5. To what extent was the cause controllable by the patient?

Totally controllable by the patient	6	5	4	3	2	1	0	Totally uncontrollable by the patient

6. To what extent was the cause controllable by you?

Totally controllable by me	6	5	4	3	2	1	0	Totally uncontrollable by me

7. To what extent do you think the patient could have foreseen the cause of the hypo?

Totally foreseeable by the patient	6	5	4	3	2	1	0	Totally unforeseeable by the patient

TABLE 1
Means, Standard Deviations and Reliability Data for Clinical Staff's Ratings on the Seven Perceived Control Scales

Scale	Mean	*S.D.*	Alpha	Range of Item-Total Correlations
Patient responsibility	26.3	5.0	0.56	0.18 to 0.48
Treatment	16.3	5.3	0.51	0.19 to 0.33
Externality	19.3	6.0	0.56	0.06 to 0.41
Chance	11.2	6.3	0.62	0.23 to 0.43
Patient Control	25.0	5.4	0.58	0.02 to 0.49
Medical Control	15.1	6.2	0.64	0.21 to 0.56
Foreseeability	24.2	6.0	0.73	0.33 to 0.56

TABLE 2
Intercorrelations of the Clinical Staff's Ratings on the Seven Perceived Control Scales

	Treatment	Externality	Chance	Patient Control	Medical Control	Foresee-ability
Patient responsibility	0.15	0.18*	−0.15	0.53**	0.15	0.37**
Treatment	—	0.04	−0.06	0.22*	0.65**	0.07
Externality		—	0.09	0.07	0.18*	0.06
Chance			—	−0.43**	−0.20*	−0.41**
Patient Control				—	0.39**	0.63**
Medical Control					—	0.21*
Foreseeability						—

**$p < 0.001$
*$p < 0.05$

by medical staff from the way in which patients used the scale. The significant positive correlation between the medical control and externality scales ($r = 0.18$; $p < .05$) suggested that physicians may have included nurses and paramedical staff in the "other people" category, and vice versa for the nursing staff.

There was some overlap between the two clusters identified in the intercorrelations of the seven scales. However, factor analysis confirmed the distinction between the two clusters. Table 3 shows the results of factor analysis (using the principal components extraction technique with Varimax rotation). Factor one was characterized by the "patient control" scales, and factor two consisted of the "staff control" scales. The externality scale did not load highly on either of these factors, indicating that it was not contributing to the patient or staff control dimensions and should therefore not be included in any analyses using these scales in a combined form or in comparison with patient data. Factors one and two accounted for 59.1% and 28.9% of variance, respectively. Alpha coefficients for the combined variables, "patient control" consisting of the patient responsibility, patient control, foreseeability, and chance scales) and "staff control" (consisting of the treatment recommended and medical control scales), were 0.79 and 0.75, respectively, indicating good reliability in the form of internal consistency.

TABLE 3
Factor Loadings Derived from Factor Analysis of Clinical Staff's Ratings

Scales	Patient Control Factor	Staff Control Factor
Patient responsibility	0.48	0.00
Treatment	0.06	0.69
Externality	−0.02	0.08
Chance	−0.57	−0.11
Patient Control	0.84	0.19
Medical Control	0.19	0.93
Foreseeability	0.71	0.06

Further Data Analyses

One-way analysis of variance and Chi-square were used to examine differences between patient characteristics described by each staff group. Paired *t*-tests were used to compare staff's attributions for positive and negative outcomes of diabetes management. In order to identify attribution differences between clinical staff and patients a comparison was made with existing data from patients (Bradley et al., 1984) for each of the perceived control scales, for positive and negative events separately.

Clinical Staff Ratings: Within-Group Comparisons

Table 4 gives the physician and nursing staff group means for each of the outlined patient characteristics. Both groups identified similar "typical" patients; there were no significant differences between the group means. Having established that the two types of staff had identified a similar sort of patient the data were combined from physicians and nurses. The patterns of attributions made for positive outcomes were compared with attributions for negative outcomes. Means are given in Table 5. Attributions made by the clinical staff group to both the treatment recommended and medical control scales were significantly stronger for positive than for negative outcomes (treatment recommended, $t = -7.72$; $df = 82$; $p < .001$; medical control, $t = -3.97$; $df = 82$; $p < .001$). There was a tendency to feel that negative outcomes were significantly more foreseeable by the patient than were positive outcomes $t = -2.85$; $df = 80$; $p < .01$). This general tendency for clinical staff to take more responsibility for the positive outcomes of diabetes management may be viewed as a form of self-serving bias.

Clinical Staff and Patient Ratings: Between-Group Comparisons

Table 5 allows comparison of group means for staff and patients for both positive and negative outcomes. Data from the externality scale have not been included in these analyses as the scale development procedures demonstrated that the way the externality scale was used by staff and by patients was not comparable.

TABLE 4
"Typical Patient" Characteristics:
Group Means or Percentages for Physicians and Nursing Staff

Characteristics	Physicians	Nursing Staff
Age	32.3	36.8
Sex	60% Men	62% Women
BG Monitoring	72% Yes	87% Yes
Urine Monitoring	59% Yes	62% Yes
Nos. of Injections	89% Two	92% Two
Minimum daily BG	4.8 mmol/l	5.8 mmol/l
Maximum daily BG	14.8 mmol/l	13.5 mmol/l
GHb	10.11%	9.88%

TABLE 5
Comparisons between Means for Clinical Staff and Patient Groups for Positive and Negative Events

SCALE	CLINICAL STAFF Mean	(*SD*)	PATIENTS Mean	(*SD*)	*t*	*df*	*p*
			Positive				
Patient responsibility	13.14	(3.4)	13.68	(3.3)	1.29	339	.197
Treatment	10.36	(3.8)	10.90	(4.7)	0.96	340	.336
Externality	8.99	(3.5)	4.57	(4.0)			
Chance	5.61	(3.8)	3.55	(3.8)	−4.32	338	.000**
Patient Control	12.53	(3.7)	13.82	(3.4)	2.94	338	.003**
Medical Control	8.55	(4.0)	8.81	(4.6)	0.46	339	.644
Foreseeability	11.73	(3.6)	12.16	(3.9)	0.88	336	.380
			Negative				
Patient responsibility	12.96	(2.7)	13.81	(3.6)	2.00	346	.046*
Treatment	5.98	(3.6)	2.44	(3.0)	−8.97	347	.000**
Externality	10.00	(3.7)	5.78	(4.4)			
Chance	5.95	(3.4)	6.22	(4.4)	0.52	343	.607
Patient Control	12.58	(2.8)	12.73	(3.8)	0.35	346	.726
Medical Control	6.82	(3.5)	4.24	(4.3)	−4.99	344	.000**
Foreseeability	12.90	(2.7)	11.49	(3.9)	−3.11	346	.002**

*$p < .05$
**$p < .01$

Positive outcomes: Dispositional factors were emphasized by both groups. Patients were felt to be responsible for things going well, and these events were seen as controllable and foreseeable by the patient. However, the patient group felt that they had significantly more personal control over positive events than attributed to them by the staff. The staff group, on the other hand, felt these outcomes were more due to chance than did the patients. There were no significant differences between the patient and staff ratings of medical factors.

Negative outcomes: Patient, or dispositional, factors were again emphasized by both groups when things were not going well. Staff differed significantly from patients in rating these negative events as more foreseeable by the patients than did the

patients themselves. Patients rated medical factors as being significantly less important for negative outcomes than rated by staff.

Overall pattern: Patients and staff emphasized dispositional factors for positive and negative outcomes, with patient responsibility, patient control, and foreseeability having the highest mean scale scores. There was a general tendency for patients to rate themselves as more responsible for both positive and negative outcomes than they were rated by the staff group. Medical factors were also seen by patients as less important in causing negative outcomes than they were by staff. Staff tended to rate chance as being more important for positive outcomes whereas patients' ratings were higher, but not significantly so, for negative outcomes. The pattern of attributions made by the clinical staff and patient groups for positive and negative outcomes did not support the expectation that the actor-observer bias would be evident in the differences between the two groups.

DISCUSSION

The modified perceived control scales were found to be reliable measures of attributions made by staff about their patients' diabetes management. Factor analysis showed that the perceived control scales were being used by staff in a comparable way to the patients. Two factors were extracted, one termed "patient control" and the other "staff control." Unlike the patient data, however, the externality scale did not load highly. The externality scale should not therefore be used in analyses using combined scale scores or in comparing patient and staff ratings. The internal consistency of the "patient control" variable (excluding externality) was good, with a reliability coefficient identical to that of the patients' "personal control" variable, which included externality (Cronbach's Alpha = 0.79). The reliability coefficient for the "staff control" variable indicated good internal consistency (Cronbach's Alpha = 0.75), comparable with that obtained for the patients' "medical control" variable (Cronbach's Alpha = 0.69). Therefore, although there were some differences in the way the scales were being used by the staff and patient groups, both sets of computed measures were highly reliable.

Having established the psychometric properties of these new scales, further analyses showed that the staff group exhibited some, although not all, of the expected attribution biases. Clinical staff, like the patients, tended to emphasize dispositional factors. Patient responsibility, control, and foreseeability for both positive and negative outcomes were rated as more important than situational factors. This might be seen as an example of the fundamental attribution bias, although it must be noted that our scales did not offer as many situational items for rating. A comparison between the attributions made by the clinical staff group for positive compared with negative outcomes of diabetes management demonstrated a self-serving bias, with staff tending to rate themselves as having more responsibility when things were going well and to rate medical factors as less important when diabetes management was poor. While the clinical staff group tended to take the credit when things were going

health care were also likely to be important influences on patients' health care behavior. The present article describes the development of a series of scales designed to measure clinical staff's beliefs about the causes of positive and negative outcomes associated with diabetes management. The patterns of attributions made by staff are examined and compared with those derived from our original study of patients' attributions. It was hypothesized that within the attributions made by staff and patients we would find a number of attribution biases which have been well documented in the more general literature on attributions (e.g., Ross, 1977); in particular we expected to see the fundamental attribution error in both sets of data, and self-serving and actor-observer biases were anticipated.

METHOD

Subjects

Eighty-five clincial staff (45 physicians and 40 nursing staff) participated in the study. All subjects were involved in workshops on diabetes education. The questionnaires were distributed to, completed by, and collected from participants at the beginning of each workshop. This source of subjects provided a sample of staff likely to have a special interest in the clinical management of diabetes and in the education of patients.

Measures and Procedure

Questionnaires. The questionnaire booklet was designed as follows: Subjects were first asked to consider the characteristics of a typical insulin-requiring patient attend-

FIGURE 1
Descriptions of Hypothetical Outcomes

Negative Outcomes
'Imagine that a typical patient in your clinic has recently experienced a hypo'.
'Imagine that for several days the patient has found high levels of sugar when testing their blood or urine'.
'Imagine that the patient has recently become unacceptably overweight'.

Positive Outcomes
'Imagine that their diabetes has been well controlled for a period of several weeks during which time there has been little fluctuation in blood glucose, no reactions and they have felt fit and well'.
'Imagine that good control of the patient's diabetes is restored after a period of poor control'.
'Imagine that the patient has successfully avoided the complications of diabetes such as problems with their feet'.

ing their diabetes clinic and to describe this patient on the following criteria: age, sex, whether or not they were urine or blood glucose monitoring, their range of blood glucose, and their glycosylated hemoglobin levels.

A series of scales to measure perceived control of diabetes followed. These scales were modified from those originally designed for patients (Bradley et al., 1984). Subjects were asked to identify the single most likely cause for the occurrence of six hypothetical events of which three were positive and three were negative (see Figure 1). Each cause was rated on seven perceived control scales (see Figure 2).

Original patient data used for comparison. Two hundred eighty-six insulin requiring patients (146 men, 140 women) completed measures of perceived control of diabetes while taking part in a feasibility study of continuous subcutaneous insulin infusion pumps, and other conventional diabetes treatment regimens (Bradley et al., 1984). Ages ranged from 16 to 59. The criteria for the study excluded patients who were using less than 24 units of insulin per day, who were treated with insulin for less than six months, who were blind or had undergone amputation of a lower limb, were currently pregnant, on a renal dialysis program, or were receiving psychiatric treatment.

RESULTS

Scale Development

Scale development procedures were carried out to determine the psychometric properties of the modified scales. Table 1 shows the mean total scores for each scale summed across the three positive and three negative outcomes. The possible range of scores is 0 to 36, where high scores indicate that more weight has been given to that particular causal factor. Table 1 includes Cronbach's Alpha coefficient (Cronbach, 1951) used to assess the internal reliability of the modified scales. Alpha coefficients ranged from 0.51 for the treatment recommended scale to 0.73 for the foreseeability scale—all indicating acceptable levels of reliability for six-item scales. The ranges of item-total correlations for each scale over the six hypothetical events have been included in Table 1, and it should be noted that two exceptionally low correlations were indicated for items on the patient control and externality scales. Further investigation was therefore indicated to determine whether or not these items actually detracted from the usefulness of the scales.

Table 2 shows the intercorrelations between the seven scales. Two clusters can be identified. One which we have labelled "patient control" was characterized by the patient responsibility, patient control, foreseeability, and chance scales. In this context, therefore, patterns of ratings on the patient control scale (which had produced weak item-total correlations in the reliability analysis) were consistent with our earlier findings. The second cluster consisted of the treatment recommended and medical control scales—this cluster was termed "staff control." The externality scale which had, like the patient control scale, shown low item-total correlations, did not correlate well within either of these clusters. This scale was treated in a different way

well they tended to feel there was less medical control over negative events, when, instead, foreseeability by the patients was emphasized.

A comparison between the attributions made by staff and those made by patients supported our hypotheses that significant attribution differences would be found between the two groups. Staff tended to rate the patients as having less personal control over positive outcomes, and these events were rated as more due to chance factors than the patients themselves believed. In other words the clinical staff group felt that when things were going well this had less to do with the patient and more to do with luck or chance, compared with the patients' own attributions for these events. If the actor-observer bias was occurring we would expect to see patients giving more emphasis to situational factors than did the staff. The chance and externality scales may be seen as providing a measure of situational factors but because we found problems with the staff version of the externality scale, any comparison with the patient data could be misleading. There is no evidence from the chance scales alone for the existence of the actor-observer bias.

It has already been noted that the staff group felt medical factors played a significantly greater role when things were going well than when problems occurred with diabetes management. Although the staff group rated medical factors moderately highly in accounting for negative outcomes, the patient group appeared to be reluctant to attribute problems to medical factors. One possible explanation for the significant difference between the two groups is that patients are generally more satisfied with the treatment recommended by medical staff than staff are themselves. An alternative explanation might be that patients feel they should be grateful to physicians, and do not feel it would be acceptable to blame the physician, or the advice given, for problems with diabetes management. This is not to say that patients do not blame physicians, rather that they may be reluctant to make that blame explicit.

It must be noted that the data reported here were the scale means for two groups. Variation exists within these groups. Not only was there variation around the mean for each rating scale but there was also variation in the causes identified by each staff member for each of the hypothetical events. The outcomes described in Figure 1 elicited a number of possible causes. An example of a constructive set of attributions for one of the positive outcomes, was "the combination of correct insulin dose and dietary allowance." This was rated as controllable and foreseeable by the patient. Medical factors were rated as important but chance factors were not rated highly in causing this period of good control. This is a supportive set of attributions which would be likely to encourage the patient to maintain good diabetes control. At the other extreme, however, there were some clinical staff who reported this event as being primarily due to luck. The pattern of attributions made in such cases might be described as helpless. The chance scale was rated highly but neither the patient nor medical factors were rated as important. Such a view of the patient's diabetes management offers the patient very little encouragement for achieving similar goals in the future. This view is also depressing for the medical staff themselves.

The wide variety of available attributions makes for a strong possibility of mis-

matches occurring between clinical staff and patients. We would expect constructive consultations to be more likely to occur when both patients and staff become aware of each other's attributions for different events and can work together towards resolving any differences between them.

In this article we have investigated the global patterns of attributions within a staff group and have made comparisons between the staff data and existing data from patients. Caution is needed in generalizing the present findings to real-life physician- or nurse-patient dyads. However, the development of the appropriate and reliable measures of staff attributions described here has enabled research to progress with investigations of attribution mismatches in real-life consultations. The consequences of such mismatches for health care are now being examined.

NOTES

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