Unanswered and uncounted items of the illness behavior questionnaire count: a comparison between patients who answered all the items in the questionnaire and those who left one or more items unanswered in a pain management program

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Abstract

Purpose. This study aimed to understand the significance of unanswered and uncounted items on the illness behavior questionnaire (IBQ) in the setting of the Mayo Clinic pain management program for patients with chronic pain.
Methods. Three hundred and seventy-eight patients who completed the questionnaire were studied. The data included (1) age, (2) IQs, (3) IBQ score profiles, (4) litigation status, (5) admission status (inpatient *vs* outpatient), and (6) dismissal status ("graduates" *vs* "dropouts").
Results. Comparison between patients who answered all the items ($n = 272$) and those who left one or more items unanswered ($n = 106$) showed a significant difference in the completion rate of the Wechsler Adult Intelligence Scale ($P < 0.05$), Scale 5 (affective disturbance) score ($P < 0.05$), and the rate of dropout from the program ($P < 0.05$). Also, those who dropped out of the pain management program had a significantly lower score on Scale 5 ($P < 0.001$) and a significantly greater number of unanswered items that were not counted toward the scale score ($P < 0.05$).
Conclusion. Unanswered and uncounted items of the IBQ seem to count toward a better understanding of patients' pain behavior.

Key words Pain behavior · Pain management · Chronic pain · Questionnaire · IBQ

Introduction

According to a recent report, there are more than 1000 multidisciplinary pain centers available for patients with chronic pain [1]. Most of these programs are designed to manage chronic pain by using the principles of cognitive–behavioral therapy. Specifically, these programs focus on pain behaviors, a product of patients' experience of pain, rather than pain itself.

The behavioral approach to the management of chronic pain starts with the assessment of pain behavior [2], and questionnaires are one of the most frequently used methods to acquire this information. One such is the illness behavior questionnaire (IBQ) (see Appendix) developed by Pilowsky et al. [3–5] and used in the Mayo Clinic pain management program (PMP) since the late 1970s. In addition, the IBQ is widely used for the evaluation of patients with chronic pain [6]. The IBQ, based on the notion of abnormal illness behavior, is a self-report instrument consisting of 62 dichotomous (yes/no) items that is designed to measure the patient's attitude, ideas, actions, and attributions in relation to illness [3,7]. In computing scale scores for the IBQ, it is assumed that every individual item of the questionnaire was answered properly by the responder. However, it is not unusual that patients leave one or more questions unanswered by either leaving it blank or answering both yes and no. This could lead to the IBQ scale scores being artificially low or even invalid.

While reviewing the computerized IBQ data set of our PMP patients, we began to wonder about the significance of unanswered items in the IBQ. We also wondered about a cluster of items uncounted toward the IBQ scale scores. The present study was designed to examine the overall hypothesis that unanswered and uncounted items of the IBQ were of value in understanding the patients' behavior.

Materials and methods

Description of the program

The PMP at the Mayo Clinic is mainly an outpatient program specifically designed for patients with chronic pain of nonmalignant cause. It is intended to help the patient and family cope with pain more effectively, to reduce the intake of medication to a minimum, to teach self-treatment methods, and, if possible, to reduce pain.

Treatment consists of the following components: a cognitive–behavioral approach, physical rehabilitation measures, medication management, education, group psychotherapy, stress management, family member participation, and supportive psychological treatment [8–12].

Measurement

The IBQ was introduced originally by Pilowsky et al. [4] to study the health beliefs and concerns of patients seen by psychiatrists in a general hospital setting. The questionnaire consists of 62 items that developed from an original 52-item version [4]. As the result of a principal component analysis by rotation of factors by the Varimax method, seven factors were named: general hypochondriasis (Scale 1), disease conviction (Scale 2), psychological *vs* somatic focusing (Scale 3), affective inhibition (Scale 4), affective disturbance (Scale 5), denial (Scale 6), and irritability (Scale 7). In addition, Pilowsky [5] recently introduced some new factors: interpersonal sensitivity (Scale 8), responsiveness to medical reassurance (Scale 9), illness impact (Scale 10), insight (Scale 11), and biological function (Scale 12).

Patient population

Between February 1990 and August 1993, 432 (290 females and 142 males) patients were admitted to the PMP. Of these, 380 patients (255 females and 125 males) turned in completed IBQs (2 female patients failed to answer any of the questions on the last page), and 52 (35 females and 17 males) did not. This left a group of 378 patients (253 females and 125 males, 87.5% of the original population) with a "completed" IBQ for the study. Table 1 shows the sites of chronic pain for these 378 patients.

Specific hypotheses

We developed the following hypotheses on the basis of our clinical experience in the PMP, impressions formed while carefully reviewing the computerized data of the IBQ, and a review of the literature.

Hypothesis 1 (age)

Patients who leave items unanswered are more likely to be older than those who answer all the questions. Several previous studies have indicated that elderly persons are more likely than younger ones to refuse to answer specific questions, because of decreased levels of motivation, memory, attention, or cognitive ability [13–16]. For this reason, the PMP had, until very recently, a cut-off age of 65 years.

Table 1. The sites of chronic pain

Site	No. of patients (%)
Low back	164 (43.4%)
Low extremity	157 (41.5%)
Neck/head/face	137 (36.2%)
Upper extremity	132 (34.9%)
Mid/upper back	97 (25.7%)
Abdomen	26 (6.9%)
Pelvis	21 (5.6%)
Chest	20 (5.3%)
Entire body	16 (4.2%)

Note: $N = 378$. A single patient may have multiple sites of pain.

Hypothesis 2 (IQs)

Patients who do not answer all items are more likely to have lower IQ scores on the Wechsler Adult Intelligence Scale (WAIS). A previous study showed that cognitive ability correlated with the number of unanswered items on questionnaire [17].

Hypothesis 3 (IBQ score profiles)

Patients who do not answer all items are more likely to have lower IBQ profiles. This hypothesis reflects that IBQ scores are computed by adding up the number of items answered positively; therefore, not answering one or more items only reduces the scale score, never increases it.

Hypothesis 4 (litigation status)

Patients who are involved in litigation are more likely to leave items unanswered. This hypothesis comes from a clinical impression that patients involved in litigation are not the best candidates for the PMP and are not fully cooperative.

Hypothesis 5 (admission status)

Patients who were inpatients at the time of admission are more likely to leave items unanswered. The data examined for the present study were collected during the period when the PMP gradually shifted from being mainly an inpatient program to mainly an outpatient one. During this transition, patients with more complications, such as chemical dependency, and more fragility in terms of motivation and attitude were admitted to the PMP as inpatients.

Hypothesis 6 (dismissal status)

Patients who do not answer all items are more likely to drop out of the program.

Table 2. Patient characteristics

Variable	Patients without unanswered items	Patients with unanswered items
	$N = 272$	$N = 106$
Age (mean ± SD)	45.1 ± 14.1	47.2 ± 14.4
IQs		
Available	165	49*
Not available	107	57*
Duration of pain (months) (mean ± SD)	70.0 ± 96.8	60.4 ± 80.3
Litigation		
Yes	52	22
No	174	62
N/A	46	22
Admission status		
Inpatient	126	46
Outpatient	146	60
Dismissal status		
Graduates	238	83**
Dropouts	34	23**

N/A, no answer.

*,** $P < 0.05$.

Statistical analysis

The data considered in the present study included age, IQs, IBQ score profiles, litigation status, admission status (inpatient *vs* outpatient), and dismissal status ("graduates" *vs* "dropouts"). All the data except dismissal status were recorded at the time of admission. The statistical analyses performed were the unpaired *t*-test for hypotheses 1, 2, and 3, and the χ^2-test for hypotheses 2, 4, 5, and 6.

Results

Table 2 gives the results of a comparison of the characteristics of patients who answered all the IBQ items and those of patients who left one or more items unanswered.

Age

Of the 378 study patients, 272 patients (72.0%) answered all the items on the IBQ and 106 patients (28.0%) did not. Their mean ages (± SD) were 45.1 (± 14.1) years and 47.1 (± 14.4) years, respectively. No statistically significant difference was found between the two groups.

IQs

IQ scores (full-scale IQ, verbal IQ, and performance IQ) were available for 165 of the 272 patients who answered all the items (60.7%) and for 49 of the 106 who did not (46.2%). The difference in availability of IQ

Table 3. Wechsler adult intelligence scale scores

Variable	Patients without unanswered questions	Patients with unanswered questions
	$N = 165$	$N = 49$
IQs		
FIQ (mean ± SD)	95.5 ± 10.7	95.3 ± 9.6
VIQ (mean ± SD)	95.4 ± 10.4	94.7 ± 9.8
PIQ (mean ± SD)	95.8 ± 13.0	97.2 ± 11.5

FIQ, full scale IQ; VIQ, verbal IQ; PIQ, performance IQ.

scores between the two groups was significant ($P < 0.05$). Table 3 gives the results of a comparison of the WAIS score of those who answered all the items of the IBQ and those who did not. No statistically significant difference in the mean score of any of the WAIS scales was found between the two groups.

IBQ score profiles

Table 4 gives the results of a comparison of the IBQ score profiles of patients who answered all the items and those who did not. Of 11 IBQ scales, the mean scores of 10 scales did not differ significantly between the two groups. For Scale 5, affective disturbance, the difference between the two groups was significant ($P < 0.05$).

Litigation

Of the 272 patients who answered all the items on the IBQ, 52 patients (19.1%) were involved in litigation,

174 (64.0%) were not, and 46 patients (16.9%) did not provide a clear answer. Of the 106 patients who left one or more items unanswered, 22 (20.8%) were involved in litigation, 62 (58.4%) were not, and 22 patients (20.8%) did not provide a clear answer. No statistically significant difference was found between the two groups in terms of categorical distribution. However, as for the percentage of patients who did not provide a clear answer, patients who left one or more items unanswered were more than patients who answered all the items. This suggests that a further follow-up investigation is needed to clarify this hypothesis.

Admission status

Of the 272 patients who answered all the items on the IBQ, 126 (46.3%) were inpatients and 146 (53.7%) were outpatients at the time of admission to the PMP. Of the

Table 4. IBQ score profiles

Scale	Patients without unanswered items (mean ± SD)	Patients with unanswered items (mean ± SD)
	N = 272	N = 106
GH	21.9 ± 21.3	19.1 ± 17.5
DC	58.3 ± 24.0	58.3 ± 23.0
PS	15.4 ± 18.0	13.9 ± 16.8
AI	58.0 ± 29.6	54.4 ± 28.1
AD	58.3 ± 34.8	49.1 ± 34.7*
D	56.3 ± 33.9	62.5 ± 35.3
I	49.5 ± 34.9	43.8 ± 31.0
IS	25.2 ± 25.2	25.6 ± 24.8
RMR	44.1 ± 29.0	45.3 ± 29.5
II	58.6 ± 23.4	58.2 ± 23.0
INS	22.4 ± 30.0	16.4 ± 23.5

*$P < 0.05$.

106 patients who left one or more items unanswered, 46 (43.4%) were inpatients and 60 (56.6%) were outpatients. No statistically significant difference was found between the two groups.

Dismissal status (graduates vs dropouts)

Of the 272 patients who answered all the items on the IBQ, 238 (87.5%) completed the PMP program ("graduates") and 34 (12.5%) dropped out ("dropouts"). Of the 106 patients who left one or more items unanswered, 83 (78.3%) completed the PMP program and 23 (21.7%) dropped out. The difference between the two groups was significant ($P < 0.05$).

To clarify this difference, each IBQ scale was subjected to the χ^2 test, using the 2 (graduates and dropouts) × 3 ("yes" items, "no" items, and "unanswered" items) contingency table. Table 5 shows the count of yes, no, and unanswered items on each IBQ scale. A statistically significant difference between graduates and dropouts was found on Scale 5 (affective disturbance) ($P < 0.001$). A significant difference was also found between graduates and dropouts in the cluster of items that were not counted toward the scale scores of the IBQ ($P < 0.05$).

Discussion

The reasons patients leave IBQ items unanswered must be numerous. Some patients may not answer items because of carelessness, and some because of temporal confusion. Still others may have chosen not to answer because of conflict, anxiety, frustration, anger, resentment, or dislike, or any combination of these. Also, some patients may not be able to decide between yes and no and so select both answers [18]. Furthermore,

Table 5. Number of unanswered items with yes-and-no answer

Scale (No. of items)	Graduates (N = 321)			Dropouts (N = 57)		
	Yes	No	Unanswered	Yes	No	Unanswered
GH (9)	605	2266	18	105	401	7
DC (6)	950	941	35	166	172	4
PS (5)	628	962	15	103	180	2
AI (5)	895	693	17	147	133	5
AD (5)	893	692	20	144	129	12*
D (5)	680	905	20	115	164	6
I (5)	721	851	33	122	154	9
IS (5)	394	1193	18	74	208	3
RMR (3)	534	392	37	88	78	5
II (5)	930	650	25	158	117	10
INS (3)	197	759	7	33	135	3
Uncounted (13)	2059	2058	56	357	365	19**

*$P < 0.001$; **$P < 0.05$.

patients may skip items because they do not believe the items apply to them [19]. The goal of the present study was to learn more about the factors associated with the behavior of leaving one or more items unanswered.

Our study did not reveal any association between older age and the behavior of not answering all the items on the IBQ. The PMP used to have the age of 65 as a cut-off for admission. This age cut-off was based on a clinical impression, and the claim made by earlier studies that elderly persons are more likely than younger ones to refuse to answer specific questions because of decreased levels of motivation, memory, attention, and cognitive ability [13–16]. This criterion was recently removed because of the finding that elderly patients do as well as younger ones in the PMP (Bruce BK, Rome JD, Suda KW, Hodgeson JE, Payne J, and Maruta T, read at the 20th annual meeting of the Association for the Advancement of Behavior Therapy, Boston, Massachusetts, November 19–20, 1992). The results of the present study argue against age discrimination in providing a pain management service for elderly patients.

In a report on the influence of cognitive ability on responses to questionnaire measurement, particularly measurement precision and missing response problems, Stone et al. [17] concluded that cognitive ability correlated with the number of unanswered questionnaire items. In our study, IQs did not differ significantly between patients who answered all the items and those who did not. This finding supports the claim of Pilowsky et al. that "the IBQ items are written simply so that their relevance and meaning will be reasonably comprehensible to the person responding" [4].

Fewer results of the WAIS were available for the patients who left one or more items unanswered. This is due partly to this group of patients having a higher dropout rate. Some patients left the PMP before the test was administered, and others did not take the test because of their reluctance to keep an appointment for testing, a reflection of poor commitment and motivation.

Scale 5 of the IBQ, affective disturbance, measures the degree of anxiety, depression, and tension experienced by the patients [4,5]. Sample questions include: "Do you have trouble with your nerves?", "Do you find that you get anxious easily?", and "Do you find that you get sad easily?". Low scores on this scale generally suggest a tendency for the patient to focus on physical aspects and to avoid awareness of other difficulty [4]. The affective disturbance scale was the only scale of the IBQ on which scores were significantly different between the two groups. Patients who leave one or more items unanswered may be trying to avoid dealing with affective disturbances such as anxiety, depression, and emotional conflicts.

At the PMP program, initial inpatient status was recommended for patients who needed monitoring for medical problems, supervision of medication use, or assistance in motivational issues. Often their level of attention and cognitive abilities are not at their best. However, the results of the present study do not support our original hypothesis that patients who were inpatients at the time of admission are more likely to leave items unanswered. This result clearly shows that patients' level of attention and cognitive abilities are not different between inpatients and outpatients.

Because the difference in number of dropouts between the group that answered all the items and the group that did not was significant ($P < 0.05$), a comparison was made between graduates and dropouts. A significant difference between the two groups was found in Scale 5, affective disturbance ($P < 0.001$), indicating that patients who drop out of the program are more inclined not to "deal with tension, anxiety, and depression." This finding is consistent with our clinical impression of the patients who leave the program prematurely. Another "scale" that showed a significant difference ($P < 0.05$) was the cluster of items that were not counted toward the scale score. Sample questions include: "Do you worry a lot about your health?", "Do people feel sorry for you when you are ill?", "Are you upset by the appearance of your face or body?", and "Are you always a cooperative patient?". These questions ask patients about their attitude toward the illness, the inside of their mind, and their feelings toward other people. Uncounted items seem to count toward the understanding of patients with chronic pain in terms of their motivation, commitment, and behavior, particularly when unanswered.

In summary, the results of the present study support our original hypothesis that unanswered and uncounted items of the IBQ are of value in understanding the general pain behavior of patients with chronic pain.

Appendix

Illness behavior questionnaire

Here are some questions about you and your illness. Circle either YES or NO to indicate your answer to each question.

1. Do you worry a lot about your health?　　YES　NO
2. Do you think there is something
   seriously wrong with your body?　　　　YES　NO
3. Does your illness interfere with your
   life a great deal?　　　　　　　　　　YES　NO
4. Are you easy to get on with when you
   are ill?　　　　　　　　　　　　　　YES　NO

5. Does your family have a history of illness? YES NO

6. Do you think you are more liable to illness than other people? YES NO

7. If the doctor told you that he could find nothing wrong with you, would you believe him? YES NO

8. Is it easy for you to forget about yourself and think about all sorts of other things? YES NO

9. If you feel ill and someone tells you that you are looking better, do you become annoyed? YES NO

10. Do you find that you are often aware of various things happening in your body? YES NO

11. Do you ever think of your illness as a punishment for something you have done wrong in the past? YES NO

12. Do you have trouble with your nerves? YES NO

13. If you feel ill or worried, can you easily be cheered up by the doctor? YES NO

14. Do you think that other people realize what it's like to be sick? YES NO

15. Does it upset you to talk to the doctor about your illness? YES NO

16. Are you bothered by many pains and aches? YES NO

17. Does your illness affect the way you get on with your family or friends a great deal? YES NO

18. Do you find that you get anxious easily? YES NO

19. Do you know anybody who has had the same illness as you? YES NO

20. Are you more sensitive to pain than other people? YES NO

21. Are you afraid of illness? YES NO

22. Can you express your personal feelings easily to other people? YES NO

23. Do people feel sorry for you when you are ill? YES NO

24. Do you think that you worry about your health more than most people? YES NO

25. Do you find that your illness affects your sexual relations? YES NO

26. Do you experience a lot of pain with your illness? YES NO

27. Except for your illness, do you have any problems in your life? YES NO

28. Do you care whether or not people realize you are sick? YES NO

29. Do you find that you get jealous of other people's good health? YES NO

30. Do you ever have silly thoughts about your health which you can't get out of your mind, no matter how hard you try? YES NO

31. Do you have any financial problems? YES NO

32. Are you upset by the way people take your illness? YES NO

33. Is it hard for you to believe the doctor when he tells you there is nothing for you to worry about? YES NO

34. Do you often worry about the possibility that you have got a serious illness? YES NO

35. Are you sleeping well? YES NO

36. When you are angry, do you tend to bottle up your feelings? YES NO

37. Do you often think that you might suddenly fall ill? YES NO

38. If a disease is brought to your attention (through the radio, television, newspaper, or someone you know), do you worry about getting it yourself? YES NO

39. Do you get the feeling that people are not taking your illness seriously enough? YES NO

40. Are you upset by the appearance of your face or body? YES NO

41. Do you find that you are bothered by many different symptoms? YES NO

42. Do you frequently try to explain to others how you are feeling? YES NO

43. Do you have any family problems? YES NO

44. Do you think there is something the matter with your mind? YES NO

45. Are you eating well? YES NO

46. Is your bad health the biggest difficulty in your life? YES NO

47. Do you find that you get sad easily? YES NO

48. Do you worry or fuss over small details that seem unimportant to others? YES NO

49. Are you always a cooperative patient? YES NO

50. Do you often have the symptoms of a very serious disease? YES NO

51. Do you find that you get angry easily? YES NO

52. Do you have any work problems? YES NO

53. Do you prefer to keep your feelings to yourself? YES NO

54. Do you often find that you get depressed? YES NO

55. Would all your worries be over if you were physically healthy? YES NO

56. Are you more irritable toward other people? YES NO

57. Do you think that your symptoms may be caused by worry? YES NO

58. Is it easy for you to let people know when you are cross with them? YES NO

59. Is it hard for you to relax?	YES	NO
60. Do you have personal worries which are not caused by physical illness?	YES	NO
61. Do you often find that you lose patience with other people?	YES	NO
62. Is it hard for you to show people your personal feelings?	YES	NO

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