

Response rate in patient satisfaction research: an analysis of 210 published studies

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Abstract

Objectives. To examine the quality of response rate reporting and to identify methodological factors influencing response rates in published patient satisfaction studies.

Design. Examination and analysis of 210 studies from 200 papers published in 1994 in 141 different health journals. Papers were located in the following databases: British Nursing Index, CINAHL, EMBASE, MedLine, Popline, and PsycLIT.

Main measures. Reported and calculated response rates, collection and recruitment procedures of published studies, and type of instruments used for data collection.

Results. Forty-eight per cent of studies reported a response rate. The mean response rate was 72.1%. There was no association between response rate and the type of instrument used for data collection. Studies which used a face-to-face approach to either subject recruitment (mean response rate, 76.7%) or data collection (mean response rate, 76.9%) were associated with significantly higher response rates than those in which subjects were recruited by mail (mean response rate, 66.5%) or data were collected by mail (mean response rate, 67%). Response rate was not related to questionnaire length.

Conclusion. Patient satisfaction studies generally show poor awareness of the importance of methodological issues relevant to response rate. Far more attention to this aspect is needed if findings in this field are to be accepted as valid and useful.

Keywords: health services research, mailed survey, patient satisfaction, response bias, research design, survey methods

Patient satisfaction has become well established as an important consideration in health care provision [1]. In the UK the pressure for National Health Service (NHS) care providers to assess patient satisfaction has been intensified in the past 15 years by government initiatives such as the 1983 NHS Management Inquiry [2], the 1989 White Paper *Working for Patients* [3], and the 1990 NHS and Community Care Act [4]. This movement is reflected in a 20-fold increase in the number of studies published between 1968 and 1994 [5], with studies appearing from an extensive range of health care contexts.

Nevertheless, on the whole satisfaction studies have persistently displayed a lack of conceptual and methodological rigour [6–8]. Small, locally designed assessments, commonly conducted by health care providers both in the UK and in the USA, seem particularly prone to methodological deficiencies. Therefore, there is a danger that decisions concerning care provision are made from data which are inherently flawed.

Survey response rate is one methodological issue which is seldom systematically examined. It is accepted that response rate must be maximized, as incomplete response contributes to uncertainty as to the generalizability of the findings as a result of potential response biases [9]. Although it is considered standard practice to report the response rate in patient satisfaction research, few researchers interpret the significance of the rate in either clinical or methodological terms. Moreover, patient satisfaction researchers seem to be increasingly willing to accept relatively low response rates as both inevitable and legitimate. A response rate as low as 30% has been proposed as 'reasonable' for patient satisfaction surveys [10], while 50% has been considered 'quite high' [11] and 80% 'very high' [12] or indeed 'remarkable' [13]. Such proposals have no basis in sampling theory and have no support from other established disciplines; a response rate of 80% has been proposed as an absolute minimum for epidemiological studies [14].

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In a 1981 review of response rates in 43 satisfaction studies, French [15] provided a good introduction to response issues from which three particular obstacles to meaningful reporting of response can be identified: poor awareness of the significance of response bias; lack of consistency in setting eligibility and suitability criteria, leading to a lack of consistency in calculating response rate; and a lack of evidence-based parameters for 'acceptable' rates. An awareness of non-response bias is particularly important, as some evidence suggests that non-responders are likely to be less satisfied with medical care [16–18]. This study aimed to examine these issues further through a systematic review of recently published satisfaction reports. The specific objectives were:

- to estimate the extent of awareness among patient satisfaction researchers of the significance of non-response bias;
- to assess the level of consistency in the calculation of response rate;
- to examine the significance of methodological factors on response rate;
- to determine whether or not evidence exists to identify 'acceptable' response rates.

Methods

Selection of papers

This study aimed to generate a representative sample of recently published satisfaction study data. No attempt was made to identify unpublished satisfaction reports. The sample consisted of all satisfaction reports published in a chosen year, written in the English language, and listed on one of six health literature databases: British Nursing Index, CINAHL, EMBASE, MedLine, Popline, and PsycLIT. This strategy was deliberately chosen as the final sample was intended to represent studies published in familiar, well established, peer reviewed health journals. 1994 was chosen as the subject year as the publication of satisfaction-related papers peaked in this year [5].

There were two eligibility criteria for inclusion in this analysis. The first was that the published report included the results of an assessment of patient satisfaction; eligible studies therefore included both those in which the primary focus was patient satisfaction and those in which patient satisfaction was a secondary focus. Papers which contained no patient satisfaction assessment data were excluded. These included editorials, letters, discussion papers, comments, critiques, review articles, non-patient assessments of satisfaction, non-satisfaction assessments of the quality of care, and instrument development reports.

The second criterion was concerned with comparative trials. Patient satisfaction is occasionally adopted as a secondary outcome indicator in trials evaluating an intervention

of some sort, such as a treatment, a care model, or an educational programme. Typically, the responses of two or more groups are compared at a follow-up point some time after the intervention. These studies fall into two divisions: those in which patient consent is required and those in which consent is not required. Papers reporting studies of the first type were excluded, as these samples are inherently biased towards more co-operative patients. In addition, these papers seldom report the proportion of patients who refuse to participate, or reasons for refusal. Papers reporting studies of the second type were included in this analysis.

The search identified a total of 200 eligible papers.¹ Papers were published in a total of 141 different health journals. Reprints were acquired via the NHS South Thames Regional Library Service, the British Library, the Royal College of Nursing library, the British Medical Association library and from authors.

A number of papers reported results from more than one survey, or from more than one stage in a survey, or from different groups in a comparative trial. We felt there would be a clear risk of bias were these separate assessments to be treated as unrelated. The following framework was therefore used to analyse these papers:

- where two or more sets of data from related samples were reported (e.g. longitudinal studies) only the results of the chronologically first study were taken. Four papers fell into this category;
- where two or more unrelated samples were questioned using the same methodology by the same research team (e.g. comparative trials) the mean average of the results from all samples was taken. Thirteen papers fell into this category;
- where two or more unrelated samples were questioned using clearly different methodologies, whether by the same or different research teams (e.g. international comparative studies using a variety of instruments), each data set was analysed as an unrelated study. Seven papers fell into this category. These papers reported 17 studies.

Therefore, the 200 papers provided a total of 210 data sets.

Data analysis

The following methodological factors were considered as independent variables: type of data collection instrument, number of items in the data collection instrument, subject recruitment procedure and data collection procedure. The dependent variable was the response rate from each study. Data were analysed using SPSS for Windows. One-way analyses of variance, independent groups *t*-tests, and the χ^2 test were used to determine the relationship of other methodological characteristics with the response rate.

¹ A complete list of these references is available from the authors.

Table 1 Number and percentage of studies presented by geographical location of the study, data collection instrument, and sample type

Characteristic	Studies (<i>n</i>)	Studies (%)
Geographical location of study		
USA	79	38
UK	62	29
Other Europe	33	16
Canada	15	7
Australia or New Zealand	12	6
Other	9	4
Data collection instrument		
Self-report questionnaire	129	64
Interview questionnaire	54	26
Interview questionnaire and self-report questionnaire	1	<1
Unstructured or semi-structured interview	22	11
Not stated	4	2
Sample type		
Cross-sectional	91	43
Random	36	17
Convenience	32	15
Quota	31	15
Continuous audit	2	1
Not stated	18	9

Results

Methodological characteristics of reviewed studies are presented in Table 1. 'Self-report questionnaire' means a *pro forma* completed by the respondent, 'interview questionnaire' means an interview with a fixed set of questions. Both of these formats produced primarily quantitative data. Surveys using an 'unstructured or semi-structured interview' format produced primarily qualitative data. Survey sampling strategies were classified as follows: 'cross-sectional' – inclusion of all patients receiving care in a specified time frame; 'random' – selection at random of a known proportion of a population; 'convenience' – selection of the most easily accessible members of the target population, with no pre-specified sample size; 'quota' – recruitment of a pre-specified number of the target population; 'continuous audit' – on-going assessment including all patients receiving the intervention. The χ^2 test found no association between type of instrument and type of sample.

A response rate was reported by 100 (47.6%) of the 210 studies. A rate was reported by 65% of the 129 studies collecting data via a self-report questionnaire and by 20% of the 76 studies collecting data via interview ($\chi^2=39.4$, $P<0.001$). The likelihood that response rate was reported was strongly associated with type of sample. A response rate was reported by 67% of studies using a random sample, 58%

of studies using a cross-sectional sample, 26% of studies using a quota sample, and 25% of studies using a convenience sample ($\chi^2=21.7$, $P<0.001$).

Response rate was calculated in one of two ways. Of the 100 studies which reported a response rate, 70 reported the rate as a percentage of the *initial* sample selected for inclusion in the study, and 23 studies reported the response rate as a percentage of an *eligible* sample, that is the initial sample minus patients considered 'ineligible' for the study. Two studies reported both the 'initial' response rate (IRR) and the 'eligible' response rate (ERR). The formula used for calculation of response rate was unclear in the five other studies which reported a rate. Reported IRR ranged from 25% to 98%, with a mean of 68.2% (SD=19.3). Reported ERR ranged from 35% to 98%, with a mean of 77.9% (SD=17.1). These two means were significantly different ($t=2.1$, $P<0.05$).

As the IRR was the most commonly reported rate, this rate was chosen for further analyses. Of the 138 studies which did not report an IRR, 52 reported both the initial sample size and the number of respondents, thus enabling the IRR to be calculated. Therefore, an IRR was available for 124 studies. The range of IRR was 17–100%, mean 72.1% (SD=19.8). Similarly, an ERR was available for 36 studies. Both an IRR and an ERR were available for 20 studies. For this group, the mean IRR was 67.7% and the mean ERR 83.8% ($t=6.0$, $P<0.001$). The difference between IRR and ERR as a proportion of the IRR value was a mean 39.3%. There was no statistically significant difference in IRR between studies which collected data via self-report questionnaire (mean IRR=70.5%, SD=20.1, $n=90$) and those which collected data via interview (mean IRR=75.9%, SD=19.1, $n=32$).

Table 2 presents frequency data for subject recruitment procedure (the approach used to recruit subjects to the study), and data collection procedure (the approach used to collect subjects' responses).

The mean IRR for studies which used face-to-face recruitment was 76.7% (SD=20.0, $n=61$), the mean IRR for telephone recruitment was 76.3% (SD=16.6, $n=8$) and the mean IRR for recruitment by mail was 66.5% (SD=19.9, $n=44$). Overall the difference between the three groups was statistically significant ($F[2,110]=3.54$, $P<0.05$) and a modified least significant difference (LSD) test indicated that the difference between the face-to-face and mail recruitment groups was significant ($P<0.05$).

The mean IRR for studies which used face-to-face collection was 76.9% (SD=20.3, $n=47$), the mean IRR for telephone collection was 78.3% (SD=16.9, $n=9$), and the mean IRR for mail collection was 67.0% (SD=19.4, $n=52$). Overall the difference between the three groups was statistically significant ($F[2,105]=3.62$, $P<0.05$) and a modified LSD test indicated that the difference between the face-to-face and mail recruitment groups was significant ($P<0.05$).

Of the 129 studies using self-report questionnaire as the assessment instrument, 53 (41%) used the face-to-face approach for both subject recruitment and data collection, 47 (36%) used the mail approach for both recruitment and

Table 2 Number and percentage of studies presented by subject recruitment procedure and data collection procedure

Characteristic	Studies (<i>n</i>)	Studies (%)
Subject recruitment procedure		
Face-to-face	123	59
Mail	51	24
Telephone	19	9
Face-to-face/mail	2	1
Face-to-face/telephone	4	2
Mail/telephone	3	1
Not stated	8	4
Data collection procedure		
Face-to-face	106	50
Mail	61	29
Telephone	20	9
Collection box	4	2
Face-to-face/mail	2	1
Face-to-face/telephone	4	2
Face-to-face/mail/collection box	1	<1
Mail/telephone	2	1
Mail/collection box	1	<1
Not stated	9	4

collection, and 12 (9%) used face-to-face recruitment and mail collection. Fourteen (11%) used other combinations of approaches, and data were missing for three studies. The mean IRR for the face-to-face/face-to-face group was 77.7% (SD = 20.5, *n* = 26), the mean IRR for the mail/mail group was 65.8% (SD = 20.3, *n* = 41), and the face/mail group was 74.0% (SD = 15.8, *n* = 9). These three groups were not significantly different ($F[2,73] = 2.95, P < 0.06$).

Of the 76 studies using interview as the study instrument, 48 (63%) used the face-to-face approach for both subject recruitment and data collection, and 17 (22%) used the telephone approach for both recruitment and collection. Nine (12%) used other combinations of approaches, and data were missing for two studies. The mean IRR for the face-to-face/face-to-face group was 76.4% (SD = 21.6, *n* = 19), and the mean IRR for the telephone/telephone group was 75.3% (SD = 17.7, *n* = 7) (not significant).

Considering the studies which used the face-to-face approach for both recruitment and collection, there was no significant difference in the mean IRR of those studies which used a self-report questionnaire (mean IRR = 77.7%, *n* = 26) and those which used interview (mean IRR = 76.4%, *n* = 19).

The mean IRR of interview studies using either face-to-face/face-to-face or telephone/telephone for recruitment/collection (IRR = 76.1%, SD = 20.3, *n* = 26) was significantly greater than that of the questionnaire studies using mail/mail for recruitment/collection (IRR = 65.8%, SD = 19.1, *n* = 41) ($t = 2.0, P < 0.05$).

Sixty-seven of the 129 self-report questionnaire studies collected data by mail (either mail only, or mail and other

methods). In 23 cases, the study report stated that one or more reminders had been sent to non-respondents. The mean IRR for this 'reminder' group was 71.6% (SD = 16.2), and the mean IRR for the 'no reminder' group was 64.9% (SD = 20.3) (not significant).

One hundred and eighty-four studies (88% of the sample) collected data using either a self-report questionnaire and/or an interview questionnaire. The number of items in the satisfaction assessment instrument questionnaire was stated for 125 (68%) of these. The number of items ranged from 1 to 361. The mean average was 28.1 (SD = 51.0), the median average was 14, and the mode was 10. Seventy-five per cent of instruments had 30 items or less, and 38% of instruments had 10 items or less. There was a weak negative correlation between number of items and response rate ($r = -0.29$).

The issue of non-response bias was acknowledged or discussed in 49 (25%) of the 200 papers. The mean IRR of studies in the 'discussed' group was 68.0% (*n* = 40), and the mean IRR from the 'not discussed' group was 73.2% (*n* = 74) (not significant).

An analysis of possible differences between responders and non-responders was reported in 14 (7%) of the 200 papers. The mean IRR from papers which analysed these differences was 57.8% (*n* = 12), and the mean IRR from papers which did not was 73.0% (*n* = 102) ($t = 2.6, P < 0.01$).

Discussion

This study aimed to examine response rates in assessments of patient satisfaction published in well-established, peer-reviewed health journals. This strategy was chosen as it might be assumed that these studies were methodologically more rigorous than unpublished ones. We also wished primarily to examine data from research, rather than clinical audit, projects. Therefore, the sample should be useful in estimating the degree of methodological rigour in the 'best' of satisfaction research and in examining the concept of an 'acceptable' study response rate. The generalizability of these findings to the whole field of patient satisfaction research is limited. In particular, we would expect this sample to reflect a publication bias which would exclude studies generating a very low response rate or displaying poor methodological rigour.

Awareness of non-response bias

A first important finding of this study is that the reporting of a response rate in satisfaction surveys cannot be considered standard practice. Fifty-two per cent of studies in this sample failed to report a response rate, indeed 44% of studies failed to report the size of the initial sample and 4% failed to report the number of respondents. These results indicate a lack of rigour in methodology and/or reporting.

Second, the large majority of satisfaction researchers demonstrated no awareness of either the existence or the significance of response bias, a finding which is particularly worrying given the publication bias in the current study. The

primary significance of non-response is in regard to the generalizability of findings. Some authors may argue that generalizability is addressed through the sampling strategy. It must be strongly emphasized that both non-random sampling and non-response create important generalizability problems. The fact that 83% of these studies employed non-random sampling and that almost all had an imperfect response rate indicates that, to a large extent, both problems occur simultaneously. This danger is most acute if the purpose of the study is to make a descriptive statement about the level of satisfaction; convenience and quota samples in particular may produce data which has little or no validity in terms of representing a wider population, and with any sampling strategy the value of the results will be negligible if less satisfied people do not respond. However, if the purpose of the study is to correlate satisfaction with something else – typically the case in experimental studies – then the question becomes whether it is likely that the *correlation* is different in the larger population, which is very different to the likelihood that the *satisfaction level* is dissimilar in the larger population.

Level of consistency in the calculation of response rate

The second aim of this study was to examine the level of consistency in the calculation of response rate. The majority of response rates in this study was calculated using initial sample size, but a large minority – over 20% of the sample – calculated response rate using an eligible sample size.

Some researchers clearly take the view that some patients may legitimately be excluded from calculation of response rate. In the reviewed studies, common exclusion criteria included language problems, mental confusion/dementia/poor memory, learning difficulties, difficulty in tracing the patient, serious illness, and death. Less commonly, patients were excluded because the clinic became too busy and so they were not surveyed, because the patient refused to participate or ‘expressed no interest’, because it was judged that the patient ‘would suffer emotional distress’ if surveyed, because the patient failed to respond fully, or because the patient failed to attend for examination/treatment.

It is impractical to lay down which criteria are justified and which are not, not least because the appropriateness of a criterion may vary from context to context. However, it must be emphasized again that one key issue here is the generalizability of results; if subsets of patients who might be expected to have a lower level of satisfaction are excluded, then it is not appropriate to generalize the results to the larger population of patients. The literature suggests that some of these exclusion criteria may distort survey results. For example, people who have difficulty speaking English have been found to be less satisfied with medical care in the UK and elderly patients tend to be more satisfied [5].

An assessment of non-response bias is informed by the response rate and by data on the characteristics of non-responders. For the former, it is important to note that whereas some researchers select a broad target population and then exclude subsets of that population, others define

the target population far more tightly but then exclude none. Both approaches exclude some patients, often the same patients. However, the difference in approach is very important when response rate is calculated. Both the reported and the calculated data in this study showed that the two approaches produce significantly different results, with ERR values an average 40% greater as a proportion of the IRR.

Regarding patient characteristics, non-response in epidemiological surveys has been associated with unemployment, older age, higher social class, and health care behaviour [19–21]. Non-respondent characteristics have been explored to a very limited extent in the satisfaction context, but there is some evidence that non-respondents are likely to have worse health status than the population average and to be less satisfied with medical care [12,22]. Fourteen studies in our sample compared respondent and non-respondent characteristics. Eight of these reported no differences between the two groups, though test results were not presented in all cases. Data from the others indicated that non-respondents were more likely to be younger, with a higher educational level, with a lower socio-economic status, unmarried, employed, unemployed, male, healthier, or less healthy.

It is beyond the scope of this paper to suggest a solution to this state of affairs. However, it would seem sensible that in all studies the target population should be well-defined, with a clear statement of sample inclusion criteria. The influence of the criteria on response data and on the generalizability of the findings should be carefully and explicitly considered. Finally, it seems not unreasonable that the researcher document the number and characteristics of patients who declined to participate and wherever possible provide a comparison of the known characteristics of responders and non-responders, to allow some assessment of the effects of exclusion and non-response on the results.

The significance of methodological factors on response rate

The self-report questionnaire as a data collection instrument is commonly thought to produce low response rates, while the interview method is credited with higher response rates [11,23–27]. However, there has been little empirical investigation of this difference. We found no evidence that these two instruments are associated with significantly different response rates. However, this analysis has indicated clearly that both the subject recruitment procedure and the data collection procedure are important variables influencing response rates. Specifically, personal contact appears to increase response rate significantly.

In some cases, personal contact may have no implications for response bias: a high response rate may be a result of convenience – data collected during a visit to a surgery or hospital – or a covert approach to data collection, such as including items on satisfaction in a more routine, perhaps clinical, assessment. Researchers using the ‘personal contact’ approach, however, should bear in mind that the approach may increase the risk of patients’ responses being skewed by biases such as ‘social desirability response bias’, where the

argument is that patients may report greater satisfaction than they actually feel because they believe positive comments are more acceptable to study administrators, or 'ingratiating response bias', which occurs when patients use the assessment to ingratiate themselves with researchers or medical staff [28].

It is very widely believed, and it has been explicitly stated in the literature, that, "Shorter formats produce better response rates over longer questionnaires" [29]. This study found only a weak correlation between number of items and response rate. Although it appears intuitive that a short questionnaire will be more readily completed, this finding bears out our personal experience in conducting patient satisfaction studies over many years where response rates of the order of 80% have been routinely achieved with lengthy instruments of some 15–20 pages. There may be other sound reasons for keeping satisfaction questionnaires to a reasonable minimum length but the effect of long questionnaires on response rates has, in our experience, been over-emphasized and this is borne out by the present analysis.

In addition, it is often proposed that response rate in postal surveys can be increased by sending reminders to non-responders [30]. We found no evidence of significant benefit in the use of reminders. However, this finding is not conclusive; crucially, reports in which reminders were not mentioned were all classified as 'no reminder' studies, which may not be a correct assumption in some cases. In our experience of conducting satisfaction studies, a first reminder sent out within a month of the initial mailing, when the return rate has typically dwindled to a trickle, will tend to bring in a further proportion of questionnaires within the following week, typically some 10% of the total already received back.

Clearly, this study has considered only a small number of factors which may be important in maximizing the response rate in any particular satisfaction study. Other determinants will not be quantifiable in the same way, and typically no information on these may be discernible from the published reports. Aspects such as the researchers' manner and personality, or the researchers' professional relationship to the subjects of the research, are all likely to be critical, and deserve further investigation. In addition, we have found from our own satisfaction studies that apparently 'trivial' details of methodology, such as the wording of covering letters which are sent out with questionnaires, or whether the covering letter has a personal rather than a photocopied signature, have an impact on the resulting response rate. These details were not discernible in the studies reported here.

An 'acceptable' response rate?

We do not feel that the analyses in this study provided a basis on which to argue for 'acceptable' response rates. Consideration of an 'acceptable' rate requires an analysis of the sources of response bias as well as consideration of the context in which the research has been carried out, and these are beyond the scope of this paper. However, this study has provided values for average response rates across a broad sample of health contexts. These values are far higher than

those proposed as 'acceptable' elsewhere in the literature. In this sample, the least productive methodology in terms of response rate was questionnaire survey with both recruitment and collection by mail, yet even this approach produced a mean response rate of 66%, with 70% of such studies recording a rate of 60% or more.

Conclusion

The last two decades have witnessed an unprecedented increase in the volume of patient satisfaction survey activity, both published and unpublished. With this in mind, it is particularly regrettable that the issues raised by French almost two decades ago continue to be overlooked by many researchers. Researchers should be in no doubt that the unqualified exclusion of subjects from the analysis and reporting of response rate inevitably calls into question the value of results. While these issues remain unresolved, the practice of reporting two response rates, one for the original sample, another for the eligible sample, should be adopted as a matter of course. Although this study has affirmed that face-to-face contact between researchers and clients for subject recruitment is associated with an increased response rate in satisfaction studies, other factors including both the type and length of the instrument used for data collection appeared relatively unimportant. How much of the total variance in response rates in practice may be accounted for by the critical variables we have identified from reports of published studies remains undetermined, as a result of inconsistency in the reporting of methodological details and of the potential influence of intangible factors.

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