

A Comparison of Different Survey Periods in Online Surveys of Persons with Eating Disorders and Their Relatives

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Abstract

Evaluations of Internet-based interventions offered to patients with mental or psychosomatic illnesses are mostly carried out in the form of online surveys. This study tested whether modifying this time interval brings about changes in the respondents' response behavior and the make-up of the sample. Two survey strategies were compared: a postblock survey (with a variable time interval between the Internet-based intervention and the online survey) and a postspot survey (time interval standardized to 90 days). In the postspot survey, it was possible to prove a higher response rate (39.9%) than in the postblock survey (28.0%) as well as a higher number of questionnaires completed correctly and in full. No differences were identified in the basic characteristics of the random samples. It was possible to demonstrate that the quality of the online survey could be improved by standardizing the length of time. Standardization of the time difference implies a controllable degree of influence on the quality of the evaluations.

Key words: e-health, Internet, eating disorders, nonresponse, ex post facto study, Internet-based surveys

Introduction

Over the past few years, Internet-based research methods have also been used increasingly in clinical psychology. This includes, for example, carrying out online surveys to evaluate Internet-based interventions for various types of mental

and psychosomatic illnesses. The design of the evaluations varies from ex post facto studies¹⁻³ or pre/post comparisons⁴ up to one or more follow-ups.⁵⁻⁷ Specific quality criteria have already been formulated for online surveys, and as result it is of particular importance for the representativeness of online surveys that they achieve a high response rate and low nonresponse bias as indicators of good data quality.⁸

In isolated studies, systematic differences in the rates of return between individual types of survey have already been proven.^{9,10} Factors that influence the response rate such as vouchers⁷ or call-backs⁹ were rarely used and not varied systematically in evaluations of Internet-based interventions.

The time interval between the post- or follow-up measures and the point at which the online intervention took place can also be seen as a potential influencing factor on the rate of return. This time interval varied in the previous evaluations from 1 month⁷ up to 12 months.⁵ The time interval chosen most frequently for follow-up ratings was 3 months.^{4,11-14} In only one study was the time interval looked at systematically.¹ As the time interval from the intervention increased, the rates of return diminished. The different rates of return suggest specific target groups. This type of distortion caused by the time interval between the online survey and the intervention would then lead to limited evidence regarding the effectiveness of Internet-based interventions and to a reduction in the comparability of studies.

This investigation is based on a specific online consulting service, the Informations- und Beratungsserver zu Anorexia nervosa und Bulimia nervosa [Information and Consulting Server for Anorexia nervosa and Bulimia nervosa] (www.ab-server.de), founded by the Deutsche Forschungsinitiative Essstörungen e.V. [German Research Initiative for Eating Disorders] in collaboration with the Faculty of Medicine at the University of Leipzig, which provides a free online

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consulting service to persons affected by eating disorders and their relatives.^{1,3,15,16}

This study compares two online survey strategies that differ with regard to the time interval between the intervention (online consultation) and the subsequent online survey with regard to their effects on aspects of the representativeness of the results. Therewith will be proved the quality of the online survey and of the used questionnaire. Likewise, the usability of different Internet-based evaluation methods in the area of eating disorders will be studied.

Response Behavior

Initially, it was supposed that the motivation to take part in the online survey was increased as a result of the constantly shorter time interval in the postspot survey compared to that of the postblock survey, which ought to have a positive effect on the rates of return and on other aspects of the response behavior.

Sample Characteristics

It is assumed that differences in terms of their basic characteristics exist between the postblock survey and postspot survey, which may be an expression of specific selection processes (for example, in the case of longer time intervals, a selection process directed toward highly motivated people who have benefited greatly from the online consultation). In the postspot survey, these effects should be minimized by the constantly short time interval, so that this

should result in a more mixed, and therefore more representative picture of the sample. It should be possible to identify the differences between the random samples of the postblock and postspot surveys from the personal details given.

Formal Characteristics of the Online Consultation

Descriptive data from the online consultation was also included in the analyses, the aim being to verify whether taking part in the survey depended on characteristics of the online consultation. Accordingly, it is necessary to rule out the possibility of the differences in the response rates being ascribed to systematic differences in the online consultation. The following variables were analyzed: *the identity of the consultant and the length of the consultation process.*

Materials and Methods

Two 17-item online questionnaires—one for persons affected by eating disorders and one for relatives—were constructed in order to record the impact and effects of the *ab-server* online consultations. Affected persons and relatives who wanted to make use of the online consulting service were given an opportunity to voluntarily agree to take part in the online survey. These persons seeking advice could enter an e-mail address to which the invitation to take part in the online questionnaire was sent on the appropriate survey date.

Between April 2005 and November 2006, the effects of the online consultation were recorded on two dates (“postblock survey”). In

this type of survey, the invitations were sent before the cutoff date to everyone who had sought advice, irrespective of how long ago the online consultation had taken place. The time interval between the online consultation and the online survey was a minimum of 3 months and a maximum of 2 years. Between December 2006 and November 2007, people were invited to take part in the online survey, in each case 3 months (90 days) after the online consultation (“postspot survey”). The two survey strategies are shown in *Figure 1*.

In the *postblock survey*, a total of 728 invitations to take part in the online survey were sent out, of which 671 (92.2%) were delivered correctly. A total of 168 respondents completed the online questionnaire correctly and in full, a further 20 respondents completed the online questionnaire incorrectly or

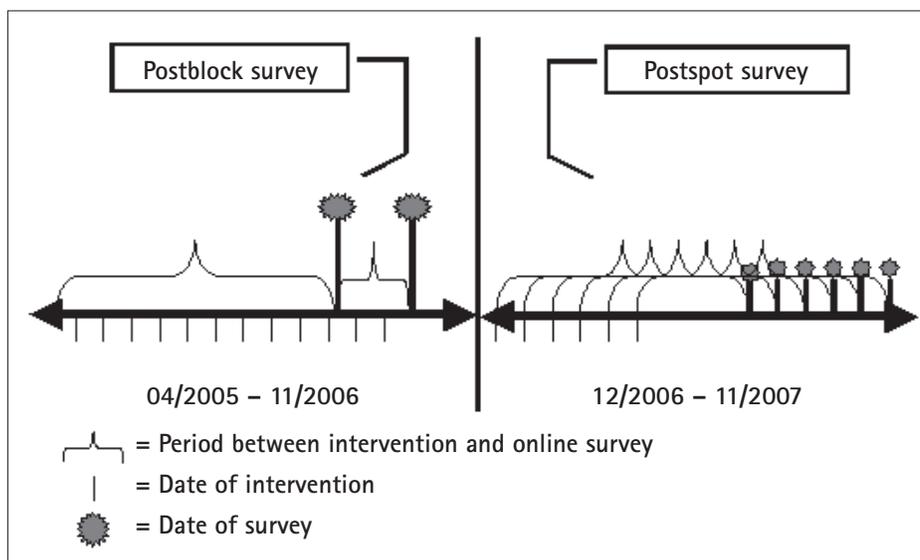


Fig. 1. Modes of investigation in the postblock and postspot surveys.

incompletely, and 78 persons only looked at the online questionnaire without completing it (Table 1).

During the period of the *postspot survey*, a total of 343 invitations to participate in the online survey were sent out. The majority (96.5%) of these were delivered correctly, and the questionnaire was completed by 127 persons and incorrectly and/or incompletely by 5 persons. Thirty-four persons looked at the questionnaire without completing it (Table 1). The difference between the numbers of the correctly delivered invitations and the correctly and incorrectly completed questionnaires gives a total response rate of 31.9% for the online survey.

Furthermore, the formal characteristics of the online consultation were included in the study. Using anonymously tracked client identification numbers, the evaluation process for the *ab-server* Web site made it possible to establish a link between the descriptive data from the consultation and the data from the survey. Through this connection it was possible to make statements about differences in the online consultation between the respondents from the two survey strategies and also between respondents and nonrespondents to the survey.

Results
RESPONSE BEHAVIOR

Comparison of the response rates. In order to determine the response rates, the ratio of the number of invitations to take part in the online survey sent out to the number of questionnaires completed in full was calculated. For the *postblock survey*, this resulted in a response rate of 28.0% and for the *postspot survey* a response rate of 39.9%. This difference between the response rates was verified statistically using Pearson χ^2 test, which proved that the difference was statistically highly significant ($\chi^2 = 14.35; p \leq 0.001$).

Comparison of the nonresponses. In order to compare the response behavior of the participants, the frequencies of the correctly com-

pleted questionnaires in the *postblock survey* and *postspot survey*, those that were filled in incorrectly or incompletely, and those which were only looked at were compared and tested for significance using χ^2 tests.

Consistent with our hypothesis, it was possible to establish that the proportion of incorrectly completed questionnaires and those that were only looked at was lower in the *postspot survey* than in the *postblock survey* (Table 1). The proportion of correctly completed questionnaires in the *postspot survey* was significantly higher. However, there was evidence of a significant effect only for the differences in the correctly completed questionnaires ($\chi^2 = 18.96; p \leq 0.001$). In the case of the questionnaires that had been filled in incorrectly and/or incompletely ($\chi^2 = 1.97; p = 0.161$) and the questionnaires that had only been looked at ($\chi^2 = 0.41; p = 0.523$), no significant differences were found between the two types of survey at the 5% level.

Comparison of the additional information volunteered. The respondents were given the opportunity at two points within the questionnaire to give additional information. First, they could give their consent to being notified about the results of the online survey by entering their e-mail addresses in a text field. Second, they were given the opportunity to write additional comments on the online consultation service in a separate text field. The frequency with which this additional information was volunteered was recorded, compared, and checked separately for significant differences using χ^2 tests. This comparison was based on the correctly completed questionnaires from both survey types ($n = 295$). Comparing the *postspot survey* to the *postblock survey*, it was possible to identify an increase in the giving of e-mail addresses from 63.7% to 68.5% and in the voluntary additions in text fields from 9.8% to 12.1% (see Table 2). However, these differences showed no significance at the 5% level (giving an e-mail address: $\chi^2 = 0.74; p = 0.388$; completing text fields: $\chi^2 = 0.40; p = 0.526$).

Table 1. Data Relating to the Survey and the Response Behavior of the Respondents

	POSTBLOCK SURVEY		POSTSPOT SURVEY		TOTAL	
	N	%	N	%	N	%
Total number of invitations sent	728	100	343	100	1,071	100
Delivered correctly	671	92.2	331	96.5	1,002	93.6
Correctly completed questionnaires	168	63.1	127	76.5	295	68.3
Incorrectly completed questionnaires	20	7.5	5	3.0	25	5.7
Questionnaires only looked at	78	29.3	34	20.5	112	25.9

SAMPLE CHARACTERISTICS

Age. The comparison of random sample characteristics was based on the information given in those questionnaires from both types of survey that had been filled in correctly/completely ($n = 295$). Since the respondents consisted of two heterogeneous groups of people seeking advice—the persons affected by eating disorders and relatives—the evaluation of these questions was carried out separately for these two groups. Figure 2 shows the age distribution of the affected persons and their relatives who were questioned in the postblock and postspot surveys.

It was possible to establish that the average ages in the postspot survey tended to be higher, among both the affected persons who were questioned and the relatives. In the postblock survey, the average age of the affected persons was 26.3 years, whereas in the postspot survey it was 27.7 years. The average age of their relatives was 32.8 years in the postblock survey and 36.3 years in the postspot survey.

The statistical verification of the age differences in both types of survey showed no significant differences on the 5% level among

either the affected persons who were surveyed or their relatives (affected persons: Mann-Whitney $U = 5,439.5$; $p = 0.438$; relatives: Mann-Whitney $U = 654.5$; $p = 0.410$).

Sex. As expected, in the analysis of the distribution by sex, it was found that women dominated among both the affected persons and the relatives. In the postblock survey, the proportion of affected women was 98.4%, and in the random sample of relatives 64.3% were female. In the postspot survey, the proportion of females affected was 95.7% and the proportion of female friends and relatives was 71.4%.

The statistical verification using the Pearson χ^2 test showed no significant differences in the distribution by sex between the two types of survey at the 5% level (affected persons: $\chi^2 = 2.33$; $p = 0.219$; relatives: $\chi^2 = 1.88$; $p = 0.505$).

Previous experience of professional help. Furthermore, the differences between the two types of survey were considered with regard to the information given by the respondents regarding their experience of professional help before the online consultation. The affected persons

Table 2. Comparison of the Data Volunteered by the Respondents

INFORMATION VOLUNTEERED	POSTBLOCK SURVEY		POSTSPOT SURVEY		χ^2	p
	N	%	N	%		
E-mail address	107	63.7	87	68.5	0.74	0.388
Use of text fields	16	9.8	15	12.1	0.40	0.526

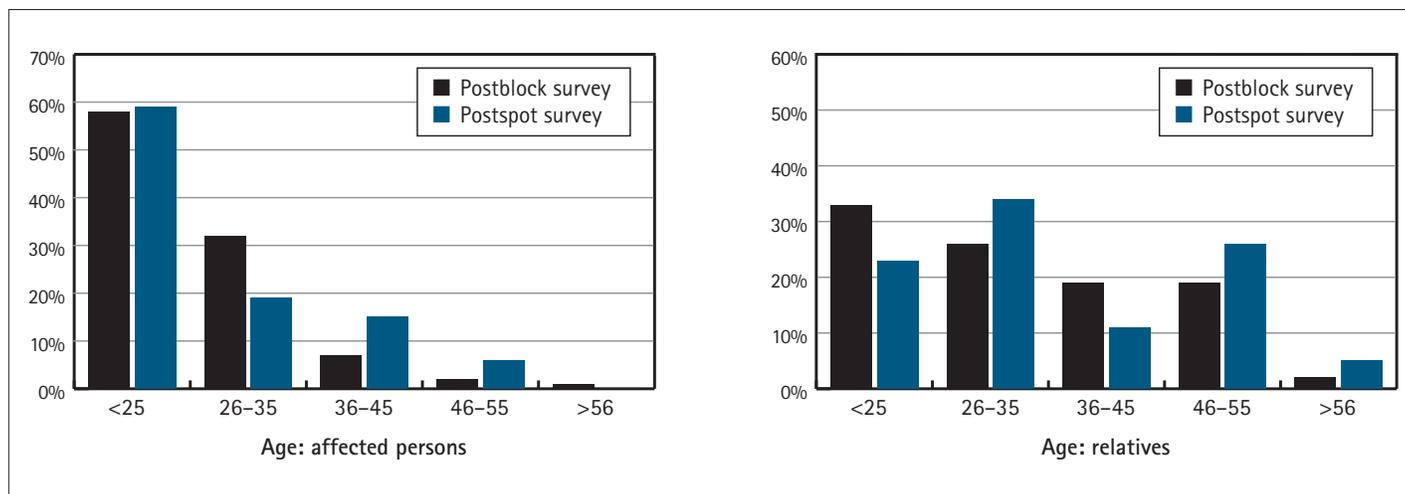


Fig. 2. Age distribution of the respondents ($n = 295$).

Table 3. Differences in Previous Experiences of Professional Help

INFORMATION VOLUNTEERED		POSTBLOCK SURVEY		POSTSPOT SURVEY		χ^2	p
		N	%	N	%		
Affected persons	No previous experience	70	55.6	45	48.9	0.94	0.332
	Advice	6	4.8	9	9.8	2.09	0.148
	Treatment	47	37.3	30	32.6	0.51	0.474
	total	126	100.0	92	100.0		
Relatives	No previous experience	32	76.2	23	65.7	1.03	0.311
	Advice	6	14.3	7	20.0	0.44	0.505
	Total	42	100.0	35	100.0		

who were surveyed had the choice between answering the relevant question with “No previous experience,” “Have already received advice,” and “Have already received treatment.” The relatives only had the option of the first two answers. The frequency distributions of the answers to this question are listed in *Table 3*.

It can be inferred from the data that the proportions of affected persons and their relatives among the respondents to the postspot survey who had already had experience of a consulting service were higher than among the respondents to the postblock survey, whereas the proportions of the respondents with no previous experience were less pronounced. However, the statistical tests carried out (χ^2 tests) showed no significance at the 5% level.

Formal characteristics of the online consultation. It was necessary to examine whether the differences between the participants and non-participants in the online surveys were a result of the characteristics of the online consultation. The duration of the consulting process and the identity of the online consultant were evaluated.

In the period from 2004 to 2006, eight consultants worked on the online consulting service. The average *duration of the consultation process* was calculated as 53.04 hours. No significant differences were identified between the respondents and nonrespondents to the survey with regard to the *duration of the consultation process* (Mann-Whitney $U = 88433.5$; $p = 0.775$). Furthermore, a check was carried out to see whether the response rate was connected to the *identity of the consultant*. Calculations showed response rates of between 16.0% and 34.9%. The differences were checked for significance using the Kruskal Wallis test. The differences showed no significance ($\chi^2 = 9.79$; $p = 0.201$).

Further evaluations were carried out separately for the two survey strategies. In both the postblock and postspot surveys, no differences

Table 4. Differences in the Duration of the Consultation Process Between Respondents and Nonrespondents to the Survey ($t_1 =$ Client Mails Request and $t_2 =$ Answer Is Stored)

	AVERAGE DURATION (IN HOURS)		MANN-WHITNEY U	p
	RESPONDENTS	NONRESPONDENTS		
Postblock survey	50.12 h	50.54 h	33,376.0	0.959
Postspot survey	55.63 h	58.80 h	12,105.5	0.272

were found in the duration of the consultation process (*Table 4*). However, it was found that the consultation process lasted somewhat longer in the case of the postspot survey.

In neither the postblock survey nor the postspot survey did the *response rate* depend on the *identity of the consultant*. Verification using the Kruskal Wallis test showed no significant differences in the *response rate* between the consultants (block: $\chi^2 = 6.175$; $p = 0.519$; spot: $\chi^2 = 3.074$; $p = 0.545$).

Discussion

The results allow us to conclude that the short time interval, such as that achieved in the postspot survey by standardizing it to 3 months, increased the motivation of the people seeking advice to take part in the online survey. This corresponds to trends observed in a previous study.¹ No significant differences in the personal details and the details of previous experience with professional help were found between the random samples of the two types of survey, and as a result no evidence could be found of specific selection processes in the random sample because of the different time intervals. No differences were found in the characteristics of the consulting service (duration of the consultation process and identity of the

consultant) between respondents to the online survey and those seeking advice who did not take part in the survey. This may be an initial indication of the fact that the online survey constitutes a representative fraction of the population of all advice seekers, both in the postblock survey and the postspot survey.

On a cautionary note, it should be borne in mind that the number of personal details listed in the questionnaire and the formal characteristics of the online consultation—to guarantee the anonymity of the participants in the low-threshold online consulting service—that were included in the assessment were limited to basic statements. Selection processes cannot be excluded altogether on the grounds of the available data—such as the possibility of having highly motivated respondents—as research from other low-threshold Internet projects demonstrates.²

It was possible to exclude some systematic differences in the comparison between those people who took part in the survey and those who did not. However, there are some shortcomings in this approach. As a result, in a future study it would be possible to analyze whether there is any evidence of the content-related aspects of the request and the consultant's answer having any influence on the respondent's response behavior.

The types of survey studied here were not carried out within the scope of pre/post measurements. The transferability of the results to studies in the pre/post design is possibly not entirely justified. The orientation of demand and low threshold of successive Internet-based intervention provision make it more difficult to implement criteria such as randomization and control group design. As the two survey strategies were implemented one after another, the influence of the time factor as a confounding variable cannot be excluded. Future research designs ought to use a procedure in which several survey strategies run in parallel to one another.

In order to measure the effectiveness adequately in future, the method used should integrate basic scientific criteria into the evaluation process without having to accept any loss of low threshold in the intervention offered. At the same time as carrying out online surveys, it makes sense to include other variables and evaluation strategies as well, in order to obtain more comprehensive statements.

Nevertheless, a few general conclusions on carrying out evaluations of Internet-based interventions can be drawn.

Implications

Until now, the timing of a survey following an Internet-based intervention has been decided mainly on the basis of disorder-specific or pragmatic aspects. However, these results show that the time interval between Internet-based intervention and the online survey

can be incorporated as an explicit determining factor. In particular, low-threshold Internet-based interventions, in which a high dropout rate is recorded (and which therefore rely particularly on representative feedback), can benefit from standardization of the timing of this sort. When evaluating Internet-based intervention programs in which work is done with larger groups of participants simultaneously, it is also worth choosing a point in time that is favorable for the response rate in any subsequent survey.

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Disclosure Statement

No competing financial interests exist.

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