ORIGINAL ARTICLE

Patient satisfaction with occupational health physicians, development of a questionnaire

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Aims: To develop a questionnaire that measures specific aspects of patient satisfaction with occupational health physicians.
Methods: General patient satisfaction questionnaires, a literature survey, and interviews with patients were used. An initial questionnaire was distributed among sick listed patients (n = 432) of occupational physicians (n = 90) from different occupational health services. To reduce items and to develop scales exploratory factor analysis and reliability analysis was used. A linear regression model was used to predict satisfaction ratings from the scales of the questionnaire.
Results: Questions about independence of the occupational physician were difficult to ask unambiguously. The factor analysis revealed five relevant factors which were named ''being taken seriously as a patient'', ''attitude towards occupational health services'', ''trust and confidentiality'', ''expectations'', and ''comfort and access''. All scales could be reduced to a maximum of five items without reducing the scale reliability too much. In the regression analysis, 71% of the variance of satisfaction ratings was explained by the first four scales and most by the first scale. ''Comfort and access'' did not contribute significantly to the model.
Conclusions: A short questionnaire was developed to measure different aspects of patient satisfaction specific for occupational health. Whether the questionnaire can effectively lead to quality improvement in occupational health services should be investigated.

Patient satisfaction is an important measure in health services research.[1] By some it is seen as a measure of outcome that can be used to evaluate treatment.[2] It has been shown that a higher patient satisfaction is related to a better compliance with advice on treatment.[3] Furthermore, patient satisfaction is supposed to give an impetus to quality improvement of health services.[4] Patient satisfaction ratings are also used to help consumers make an informed choice between health care providers.[5]

To date, most researchers assume that satisfaction is best defined as a patient's evaluation of aspects of a health care service based on the fulfilment of their expectations.[3 6 7] The evaluation is in the affective domain and ascribes favourable or unfavourable feelings towards the object of evaluation. Satisfaction is generally seen as a concept which is influenced by several factors in various domains such as interpersonal manner, humaneness, competence, technical quality, outcome, comfort of facilities, and continuity of care.[8] In their literature review, Verbeek *et al* report that there are factors in occupational health services that are specific for patient satisfaction with these services. They mention aspects such as the independence of the occupational physician, unclear reasons for seeing the occupational physician, and good knowledge of working conditions as factors that are specifically related to satisfaction in occupational health.[9]

Van der Weide *et al* and Piirainen *et al* developed questionnaires based on existing patient satisfaction questionnaires that could measure specifically satisfaction with occupational health.[10 11] However, their questionnaires did not show specific domains related to occupational health and therefore they did not have much added value over general patient satisfaction questionnaires. We wanted to expand the occupational health aspects of these questionnaires, because a patient satisfaction questionnaire with a more specific occupational health content can have a higher potency for quality improvement in occupational health services.

To get a better understanding of patients' expectations, we interviewed patients of occupational health physicians about their expectations of the visit to the occupational physician. We constructed a new questionnaire which was subsequently tested in a large patient sample. The objective of this article is to report about the contents of the new questionnaire and its psychometric properties.

METHODS

Initial questionnaire

From previous questionnaires on patient satisfaction with occupational health,[10 11] and the results of the literature review,[9] an initial questionnaire was constructed.

The items of the questionnaire were presented as statements with which the respondent could agree or disagree. Answers to the statements were made up of a five point Likert scale with the answers: totally disagree (1), do not agree (2), don't know (3), agree (4), totally agree (5). For general satisfaction we asked the patient to give a rating based on a number between 1 and 10, where 1 would mean the lowest possible satisfaction and 10 the highest possible satisfaction. We also asked them to answer to three general statements on satisfaction in general, usefulness of the visit, and meeting of expectations.

In a pilot version the questionnaire was tested with four randomly chosen patients of an Occupational Health Service, who had just seen their occupational physician, to find out about the feasibility and understanding of the questions.

Interviews

To find additional themes to be covered in the questionnaire, 13 consecutive patients of an Occupational Health Service of a large academic hospital were asked to be interviewed prior to their visit to the occupational physician. The interview had a semi-structured character, with items about expectations of the visit and previous experiences with both occupational physicians and physicians in general. The interviews were

Main messages

- In occupational health care, trust and attitude towards the occupational health physician are important underlying aspects of patient satisfaction.
- Based on literature and interviews, a questionnaire was developed for measuring patient satisfaction with occupational health physicians.
- Factor analysis and reliability analysis revealed five reliable scales in the questionnaire underlying patient satisfaction.
- The scales from the 20 item questionnaire can be used to look for causes of dissatisfaction, that can in turn be used as input for a quality improvement programme.

Policy implications

- Patient satisfaction with outcomes of occupational health care can be measured with a questionnaire specific for occupational health physicians.
- Interventions to increase patient satisfaction should be directed at improvement of the communication with the patient, the trust in, and the attitude towards occupational health services.

audio-taped and transcribed. The written transcripts were screened for common themes. Additional items were added to the initial questionnaire

Patients

The initial questionnaire was part of an ongoing research project on evaluation of the collaboration between occupational physicians and general practitioners. Occupational physicians who participated in the project were interviewed (n = 90) about patients who they had recently seen at their consultation hour. For this purpose the agenda of the physician was taken and a consecutive series of nine patients who were seen during the past week was selected by the physician together with the interviewer. The inclusion criteria were having a paid job, being on sick leave, and understanding of the Dutch language. The physicians were spread evenly over the country. During the interview, we asked them to send the questionnaire to the included patients. This resulted in 789 patients being approached, of whom 432 (55%) returned the questionnaire.

Statistics

To be able to reduce the number of items in the questionnaire and to check for the underlying assumptions about aspects specific for occupational health, an exploratory factor analysis was first performed. Responses on the items of the initial questionnaire were subjected to an exploratory factor analysis using squared multiple correlations as prior communality estimates. The principal axis factor method was used to extract the factors, and this was followed by a varimax rotation with Kaiser normalisation. In interpreting the rotated factor pattern, an item was considered to load on a given factor if the factor loading was 0.40 or greater for that factor, and was less than 0.40 for the other factors.[12] When an item loaded less than 0.40 on any factor and we could not consider it as a separate factor, it was removed from the initial questionnaire.

After item reduction, the resulting factors were interpreted as representing specific aspects of patient satisfaction. The items that made up these factors were further examined by means of reliability analysis by which the internal consistency of scale scores was estimated using Cronbach's alpha coefficient.[12] The number of items per scale was then further reduced to a maximum of five without reducing the alpha coefficient. Items with lowest item-rest correlation were omitted. Care was taken that a scale still covered the whole content of a theme. Reliability was considered adequate if >0.70, good if >0.80, and excellent if >0.90.

To enable easy comparison of the scores on different aspects of satisfaction, all scales were transformed to a scale with a minimum of 0 and a maximum of 100 by dividing the crude score minus the minimum crude score by the score range and multiplying by 100. Sixty per cent of the item scores had to be present to enable the calculation of a sum score.

Subsequently, the resulting reduced questionnaire was again subjected to an exploratory factor analysis to investigate the final factor structure of the questionnaire.

Finally, the scales were entered in a linear regression analysis as independent variables to investigate whether they could predict the general satisfaction rating. In the regression analysis missing values were substituted by mean values.

RESULTS

On the basis of the pilot test, several items were removed from the questionnaire because the interviewees interpreted the statements in different ways. Some items were altered to improve the feasibility of the questionnaire. It turned out to be difficult to ask questions about the independence of the occupational physician that were not multi-interpretable.

The interviews with the patients of the Occupational Health Services did not reveal any new themes that were not covered already.

These preparations resulted in a initial questionnaire that contained 54 items about the following themes:

- The making of an appointment (8 items)
- Satisfaction rating with the appointment making (rating from 1 to 10)
- Access and comfort (4 items)
- Interpersonal manner of the occupational physician (3 items)
- Communication (5 items)
- Expectations and continuity of care (2 items)
- Professional knowledge (7 items)
- Independence of the occupational physician (3 items)
- Trust and confidentiality (3 items)
- Satisfaction in general (3 items)
- Satisfaction in general rating (rating from 1 to 10)
- Attitude towards occupational health services (14 items).

A priori, and based on the literature review and the interviews, it was hypothesised that the questionnaire would cover at least the following six themes: access and comfort, manner and communication, expectations and continuity of care, professional knowledge, independence and trust, and attitude towards occupational health services.

The initial questionnaire with 54 items was tested in 432 patients. Half of them were male and the average age was slightly higher than that of the working population in general. They were all on sick leave and almost 80% were invited for a visit by the occupational physician. For less then 20% this was the first experience with the occupational

Table 1 Characteristics of patients of occupational physicians that filled in the initial satisfaction questionnaire (n = 432)

Characteristic	
Gender: male (%)	48.1%
Age, mean (SD)	44 (10.1) y
Reason for encounter (%)	
Visit was my own idea	18.3%
Asked by superior	3.3%
Asked by personnel manager	1.6%
Invited by Occupational Health Service	76.8%
Visits to occupational physician (%)	
First visit	18.8%
Second visit	21.4%
Third visit	11.6%
Fourth visit	9.1%
>4 visits	39.1%

physician. Almost 40% had seen the occupational physician more than four times before (table 1).

Before the data were entered into a factor analysis the number of items was reduced because the data were not available for all patients or the items were not supposed to represent dimensions of satisfaction. Since only 23.2% of the patients had made the appointment themselves with the occupational physician, the eight items about making the appointment and the satisfaction rating for appointment making were not used in the analyses. The question about the amount of time the visit had taken differed in structure so much from the other statements that it was omitted from the analyses as well. The three general items about satisfaction (satisfaction in general, usefulness of the consultation, meeting of expectations) and the satisfaction rating were not supposed to represent specific aspects of satisfaction and were left out of the factor analysis. The three satisfaction items were summed into a scale of general satisfaction.

The remaining 40 items were entered into an initial exploratory factor analysis. The items were further reduced if the items did not belong to a specific factor based on the pre-set criteria for the factor analysis. The scree test suggested six meaningful factors. For five factors a meaningful interpretation could be found. The following two items loaded on a sixth factor for which we could not find a meaningful interpretation: ''It is clear for what reasons the occupational health service invites you'' and ''The occupational health service does not send anyone back to work who is still ill''. These items were not included in the further analysis and deleted from the questionnaire. Three items about the independence of the occupational physician did not meet the criterion of a factor loading of at least 0.40 on one factor only. The statements were: ''During my visit my health came first for the occupational physician'', ''The occupational physician is there to save money for the employer'', ''The occupational physician takes only care of the interests of the employer''. These items loaded high on both the factors ''being taken seriously'' and ''trust and confidentiality''. The same held for one item about comfort which loaded on both ''being taken seriously'' and ''comfort''. Two items did not load higher than 0.40 on any factor and were omitted for that reason. Two items loaded on different factors than we hypothesised in advance and changed from overarching theme.

This resulted in 32 items and the following five factors that were supposed to represent specific aspects of satisfaction with occupational health:

- Being taken seriously as a patient (13 items)
- Having a positive attitude towards occupational health services (9 items)
- Trust and confidentiality (3 items)
- Having expectations of occupational health services (3 items)
- Comfort and access to the occupational health service (4 items).

In the last step the number in the various factors or scales was further reduced based on the reliability analysis. The 13 items of the scale ''being taken seriously as a patient'' were reduced to five items, without reducing the reliability of the scale. From the nine items of the ''attitude towards OHS'' scale, four items were omitted. The other scales had already less than five items so they were not further reduced. Both reduced scales showed high reliability. (table 2) This reduction resulted in the final 20 items that make up the questionnaire.

The scores of the resulting scales of the final 20 item questionnaire varied from 65 (21) for the attitude scale to 75 (22) for the scale ''being taken seriously as a patient'' (table 2).

Table 3 gives the mean item scores and the factor loadings of the final 20 item questionnaire. The highest scoring item was ''The OP treated me in a pleasant manner'', while the lowest scoring item was ''If my boss drove me crazy with work I would ask the OP to help me''. All items met our criterion of loading more than 0.40 on one factor and less than 0.40 on the other factors.

The regression of satisfaction on the scale scores as independent predictors yielded 71% of explained variance (table 4). It was problematic that both the satisfaction rating and the independent variables were not normally distributed but skewed to the left. Therefore, we performed the same analysis in three different ways: with the satisfaction rating, with the satisfaction scale score, and with the square transformation of both the dependent and the independent variables. The square transformation had a normal distribution when visually inspected. In all analyses, most of the variance was explained by the scale ''being taken seriously'' and next

Table 2 Means, standard deviations, Pearson inter-correlations, and coefficient alpha reliability estimates (in brackets on the diagonal) for the scales of 20 item Patient Satisfaction with Occupational Health Questionnaire (n varies from 429 to 432)

Scale	Mean (SD)	Serious	Attitude	Trust	Expect	Comfort	Satisfaction
Taken seriously	75 (22.2)	(0.94)					
Attitude	65 (20.9)	0.48	(0.87)				
Trust	71 (19.4)	0.54	0.38	(0.73)			
Expectations	70 (17.5)	0.44	0.39	0.34	(0.58)		
Comfort	75 (14.4)	0.41	0.25	0.21	0.29	(0.61)	
Satisfaction in general scale	70 (24.1)	0.82	0.59	0.57	0.43	0.33	(0.91)
Satisfaction rating	7.4 (1.97)	0.82	0.54	0.58	0.35	0.32	0.88

Table 3 Questionnaire items, mean score and standard deviation, and corresponding factor loadings from the rotated factor pattern matrix (n = 397) for Patient Satisfaction with Occupational Health Questionnaire

Questionnaire items	Mean (SD)	Factors				
		Serious	Attitude	Trust	Expect	Comfort
Being taken seriously as a patient during the last visit						
1. OP understood well what my health problems and/or problems with work were	4.1 (1.07)	**0.84**	0.16	0.19	0.12	0.20
2. The OP treated me in a pleasant manner	4.2 (0.94)	**0.78**	0.19	0.20	0.01	0.20
3. The OP knew what he/she was talking about during the conversation	4.0 (0.92)	**0.80**	0.22	0.21	0.22	0.17
4. The OP gave me good advice about my health	3.8 (1.07)	**0.75**	0.25	0.16	0.21	0.17
5. The OP seemed professional	4.0 (0.93)	**0.75**	0.24	0.14	0.23	0.17
Trust and confidentiality during the last visit						
6. For this visit, I could count on a confidential treatment of my complaints by the OP	3.9 (0.83)	0.34	0.28	**0.47**	0.23	0.15
7. I was on my guard during the conversation with the OP (reversed answer codes)	3.6 (1.13)	0.34	0.12	**0.54**	−0.02	0.01
8. During this visit I was afraid that the OP would tell my complaints to the employer without my consent (reversed answer codes)	4.0 (0.91)	0.17	0.11	**0.91**	0.14	0.04
Expectations for the last visit						
9. I had clear expectations for this visit with the OP	3.6 (0.98)	0.20	0.16	0.08	**0.54**	0.13
10. I had an appointment with the OP of my firm	4.0 (1.0)	0.14	−0.03	0.01	**0.52**	0.20
11. It is clear for what reasons you can make an appointment with the OP	3.8 (0.87)	0.13	0.39	0.23	**0.44**	0.04
Comfort and access of the last visit						
12. The OHS was easily accessible (location, public transport, parking, etc)	4.0 (1.07)	0.06	0.07	−0.01	0.09	**0.40**
13. The waiting room was comfortable	3.7 (1.05)	0.13	0.02	0.06	−0.03	**0.64**
14. The consultation room was tidy	4.2 (0.66)	0.13	0.07	0.06	0.23	**0.60**
15. Visit went on without disturbances from outside	4.2 (0.91)	0.30	0.15	0.04	0.12	**0.46**
Attitude towards Occupational Health Services in general						
16. If I got work related health complaints, I would make an appointment with the OP	3.9 (0.98)	0.19	**0.67**	0.24	0.30	0.01
17. I would advice a colleague with work related health complaints to see the OP	3.8 (0.92)	0.15	**0.63**	0.22	0.23	0.01
18. If my boss drove me crazy with work I would ask the OP to help me	3.4 (1.09)	0.21	**0.67**	0.00	0.01	0.01
19. If I was unable to work because of back pain I would ask the OP for help	3.5 (1.06)	0.01	**0.81**	-0.01	−0.01	0.13
20. If I was unable to work because of mental health problems I would ask the OP for help	3.5 (1.11)	0.24	**0.80**	0.01	0.01	−0.01

OP, occupational physician; OHS, occupational health service.
1, totally disagree; 5, totally agree.
Questions 7 and 8 had reversed response scales, which have been recoded.

by ''attitude towards occupational health'' and ''trust''. Only after square transformation the ''expectations'' scale provided some extra explanation of variation. The ''comfort and access'' scale did not contribute significantly to the model.

DISCUSSION

We developed a questionnaire to measure satisfaction with the visit to the occupational physician. The questionnaire consists of 20 questions showing at least four relevant domains of satisfaction which could be summed into scales. The scales were named ''being taken seriously as a patient'', ''attitude towards occupational health services'', ''trust and confidentiality'', and ''expectations''. The scales showed sufficient reliability and predicted the general satisfaction rating with 71% of variance explained.

We used extensive preparatory studies to gather items for the questionnaire, both with a survey of the literature and with qualitative interviews of patients of occupational health physicians. Items that were not unambiguously comprehensible for patients were deleted. We used factor analysis and reliability analysis to reduce the number of items and retained meaningful components of the questionnaire. This strongly supports the use and the structure of the resulting questionnaire. The data we used came from a great variety of

Table 4 Results of regression of satisfaction on scales of being taken seriously, attitude towards occupational health, trust in occupational physician, expectations of occupational health service, and comfort and access to occupational health service

	Satisfaction rating	p value	Satisfaction scale	p value	(Satisfaction scale)^2	p value
Adjusted R^2	0.70		0.71		0.71	
F ratio	207	<0.0001	215	<0.0001	205	<0.0001
Taken seriously	0.65	<0.0001	0.60	<0.0001	0.55	<0.0001
Attitude towards OHS	0.20	<0.0001	0.25	<0.0001	0.22	<0.0001
Trust	0.18	<0.0001	0.15	<0.0001	0.17	<0.0001
Expectations	−0.06	<0.042	0.02	<0.422	0.09	<0.007
Comfort	−0.02	<0.604	−0.03	<0.348	−0.01	<0.788

Satisfaction measured as rating, scale of three items and square transformation of scale of three items.
n = 432.

occupational physicians from all over the country, which increases the generalisability of the results.

We were able to test only the directly measurable psychometric properties of the questionnaire. In future research it has to be studied whether the questionnaire has also predictive validity in the sense that it can predict unwanted patient behaviour, such as not returning for appointments or not complying with advice. This would support its validity. Its predictive validity could also be supported by showing that the results of the questionnaire can effectively be used to improve quality of care. However, studies on the use of feedback of patient opinions to improve quality of care have not shown very positive results.[13–15]

Even though we covered a wide range of themes in our study and could include patients from different backgrounds, we could not guarantee sufficient variation in the answers. Possibly, some aspects do not influence satisfaction because of a ceiling effect. The average and median answers of most questions were around the value 4 out of 5 and very skewed to the left. It could be that the comfort scale did not influence satisfaction ratings because of this ceiling effect. On the other hand, our sample consisted of patients on sick leave only. Inclusion of patients that would have come for health examinations or preventive procedures could even have increased the ceiling effect, assuming that they would be more satisfied. The same holds for the non-responders. We had a fairly high number of non-responders, which is not unusual for a postal survey. It is generally assumed that responders use the opportunity to complain.[16] If the response rate had been higher, the ceiling effect might also have been higher.

We were not able to formulate questions about the independence of the occupational physician that were unambiguous enough to be retained in the questionnaire, even though the literature provides some evidence of its influence on satisfaction.[17 18] Independence of the physician is a difficult concept, especially in relation to occupational health, and there is no general consensus about the meaning. An independent occupational physician could, for example, act only in the interest of the employee, act only in the interest of the employer, or act only following professional standards regardless of the outcome. What would be called independent here depends on one's point of view.

There was a difference in phrasing of questions which is still apparent in the final questionnaire. The original questions were divided into those relating directly to the visit and those about a more general opinion. In the factor analysis those that represented a more general opinion loaded on the factor attitude towards occupational health services. In the regression analysis this factor explained a considerable amount of the variance in satisfaction of the last visit. Therefore, we retained these questions in the questionnaire.

In future research the questionnaire should be tested for test-retest reliability and convergent and divergent validity, in addition to the different aspects of predictive validity. Cultural aspects being related to a national culture of occupational health could also bias the results that we have found. Therefore we recommend cross-cultural research on the validity of the questionnaire. Furthermore, since this questionnaire has been tested in patients on sick leave, it needs to be more widely tested amongst workers seen by Occupational Health Services for other reasons such as health surveillance.

The majority of the patients were invited for a visit by the occupational health provider, not only as result of an earlier visit but also for the first visit. This creates a situation apparently different from that in primary care where patients almost exclusively make an appointment themselves. This could be one of the reasons that the factor of trust became influential for patient satisfaction. However, we could not find a statistically significant difference between those patients that were invited and those that made an appointment spontaneously.

To those that want to use satisfaction surveys in practice, we recommend asking patients to give a general rating of satisfaction with a number between 1 and 10, and in addition to ask them to fill out the questionnaire. This enables the comparison of satisfaction levels with those that we found here. In addition, if satisfaction is below average, it could reveal which relevant aspects that lead to satisfaction could be improved. Improvement could be realised by better communication skills, improvement of the image of occupational health services, especially related to trust and confidentiality, and being clearer about what patients can expect. Comfort and easy access to the occupational health services do not seem to influence satisfaction to a great extent.

In conclusion, we feel that we have developed a feasible instrument for satisfaction surveys that could prove to be a useful tool in quality improvement of occupational health services.

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