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Publication date
2016

Document Version
Final published version

Link to publication

Citation for published version (APA):
Kleefstra, S. M. (2016). *Hearing the patient's voice: The patient's perspective as outcome measure in monitoring the quality of hospital care*. [Thesis, fully internal, Universiteit van Amsterdam].

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Sorien Kleefstra

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Thesis, with a summary in Dutch

Proefschrift, met een samenvatting in het Nederlands

ISBN 978-94-6299-360-0
Author: Sorien Kleefstra
Coverphoto: Ruurd Jelle van der Leij
Boekverzorging: Richard Draaijer
Print: Ridderprint

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Financial support by the Dutch Health care Inspectorate (IGZ) for the publication of this thesis is gratefully acknowledged.

Hearing the patient's voice

The patient's perspective as outcome measure in monitoring the quality of hospital care

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus
prof. dr. D.C. van den Boom
ten overstaan van een door het College voor Promoties ingestelde commissie,
in het openbaar te verdedigen in de Aula der Universiteit
op woensdag 6 juli 2016, te 11:00 uur
door

Sophia Martine Kleefstra

geboren te Noordoostpolder

Promotiecommissie:

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Inhoudsopgave

Chapter 1	General introduction	7
Part I	**The development and validation of patient satisfaction questionnaires**	**27**
Chapter 2	A core questionnaire for the assessment of patient satisfaction in academic hospitals in the Netherlands	28
Chapter 3	An instrument assessing patient satisfaction with day care in hospitals	46
Part II	**A comparison of patient satisfaction scores between hospitals and over time**	**69**
Chapter 4	Patient satisfaction revisited: a multilevel approach	70
Chapter 5	Is the length of stay in hospital correlated with patient satisfaction?	92
Chapter 6	Trends in patient satisfaction in Dutch university medical centres: room for improvement for all	112
Part III	**Patient rating sites as a new development in monitoring quality**	**139**
Chapter 7	Investigating the potential contribution of patient rating sites to hospital supervision: a mixed method study	140
Chapter 8	Summary and general discussion	163
Appendices		**187**
Nederlandse samenvatting		188
COPS-questionnaires		199
Dankwoord		203
List of publications		206
Portfolio		209
Curriculum Vitae		211

Chapter 1

General introduction

The quality of care

According to the Institute of Medicine, health care should be safe, effective, patient-centred, timely, efficient and equitable [1]. It is necessary to assess the quality of care in order to monitor whether these six aims have been met, and whether improvements in care delivery are to be made. Donabedian [2] described the evaluation of the quality of care as consisting of three components: structure, process and outcome. The structure generally refers to the organization of the institution delivering care, and the conditions under which care is provided.
The process refers to the professional activities associated with providing care.
The outcome denotes the effects of care on the health status of patients. It refers to a change in a patient's current and future health that can be attributed with confidence to the care received. According to Donabedian, health status is defined as improvements in the patient's knowledge, changes in behaviour and the degree to which the patient is satisfied with care [2]. Thus, patient satisfaction is one of the desired end products of health care, along with changes in health, knowledge and behaviour [2-4].

The quality of care as seen from the patient's perspective

An important way to measure of the quality of care is to evaluate quality from the patient's perspective. While individual experiences are may be unique, patients can offer insights into hospital quality that would otherwise remain unseen. For example, the way a treatment, a care process or an interaction made them feel and behave [5]. However, using the patient's perspective for judging the quality of care has been met with some resistance [6, 7]. For instance, by taking too much notice of the patient's perspective, hospitals might focus on services that are less clinically important or are sometimes contrary to good clinical practice, for example by prescribing antibiotics to a patient with a viral infection if asked for [6]. On the other hand, clinicians have, in the past, tended to sideline the patient's perspective as too subjective or mood-oriented, and thus separated from what they view as the more real clinical relevance of measuring safety and effectiveness [8]. Another possibility concerning some clinicians is that patients may be satisfied with their experience even though their hospitals are providing care of limited effectiveness. This problem might then pass undetected [9].

Nevertheless, assessing the quality of care from the patient's perspective has become widespread and definitely provides interesting new views. Patients, for instance, are well positioned to provide reliable and valid information about the delivery of patient-centred care. After all, it is only the patients who are able to determine accurately whether care has been respectful of patient's values, preferences and needs [10]. Also, the safety and effectiveness of care can probably be well assessed by patients, as they affect directly their care experiences.

The patient's perspective and patient-centred care

Patient-centred care is essential if medical care is to be seen as excellent, as stated by the Institute of Medicine in 2001 [1]. Gerteis et al defined patient-centred care as consisting of seven areas: respecting patient's values, preferences and expressed needs; coordinating care; providing information, communication and education; attending to physical comfort; providing emotional support and the alleviation of fear and anxiety; involving family and friends in care; and ensuring continuity among providers and treatment settings [11]. Since then, politicians and policy makers have drawn ample attention to acknowledging the patient's perspective in research and in health care organizations, so as to improve patient-centred care. Research has shown that patient-centred care increases quality, efficiency [12] and may reduce costs [13, 14]. Furthermore, patient-centred care is associated with higher patient satisfaction, enhanced adherence [6], improved knowledge of the patient's illness and health behaviour [6, 8], and less use of health care [15]. When patients have better experiences they are more likely to adhere to treatments and return for follow-up appointments [6]. It can also encourage compliance with medication [8]. In addition, patient engagement, that is patients being well-informed and having decisions taken in line with their preferences, has a beneficial impact upon outcomes, such as better recovery and better functional status [8]. Patient-centred care is also associated with several health benefits. These include: reduction in the length of hospital stay for patients after hip fracture [16] and chronic heart failure [17]; reduction of patient anxiety and uncertainty [18]; improved pain relief [19]; reduction of medical complications after surgery [16]; and cost savings [20, 21].
One might therefore say that paying attention to the patient's perceptions of care is not just good policy – it is good medicine too, and therefore necessary [6, 7].

The patient's perspective, patient safety and clinical effectiveness

Health care should be safe and effective [1]. There is a growing body of empirical research concerning the association between the patient's perspective and the quality of care, patient safety and clinical effectiveness. A recent systematic review [8] showed consistently positive associations between patient experiences, patient safety and clinical effectiveness. This was demonstrated across a range of disease areas, study designs, settings and population groups and included both self-assessed physical and mental health and what are seen as more objective measures of health outcomes such as those measured by a clinician or indicated in a medical record. Negative associations were rare and positive associations clearly outweighed no associations [8]. Another study showed that hospitals with lower overall ratings from their patients tended to have lower measures of technical quality [22].

A strong association has been shown between the quality of patient-doctor communication, as judged by patients, and their adherence to medical treatment. The odds of patient adherence were 1.62 times higher when physicians had received communication training [8, 23]. Also, Black found positive associations between, on the one hand, aspects of communication and trust in the doctor, and, on the other hand, safety and effectiveness [9]. Finally, positive associations were found regarding compliance with medication, the use of preventive services and the use of resources such as hospitalizations, readmissions and primary care visits [8].

There is also some evidence that the patient's perspective on the quality of care is associated with clinical outcome measures. For instance, patient-centred care is associated with one-year survival after discharge [24] and with fewer hospital readmissions within 30 days, after adjusting for clinical quality of surgery [25]. This also applies to the most common major surgical conditions. Hospitals with patients who judge their experience positively have lower readmission rates and a greater adherence to process measures [26]. A national US study of acute hospital care showed that hospitals with the highest adherence to clinical guidelines and evidence-based processes of care also had higher scores on standards for measuring the patient experience than hospitals with lower levels of adherence to care based upon guidelines [27]. Some studies show positive associations between an enhanced patient perspective and the safety of care as recorded by means of a variety of patient safety indicators including: decubitus ulcer; infections due to medical care; post-operative haemorrhage; respiratory failure; pulmonary embolism; and sepsis [28]. Furthermore, patient feedback is positively associated with staff hand-washing and for lower levels of MRSA infection [7, 29, 30]. Finally, studies concerning patient rating sites showed correlations with relevant clinical outcomes such as readmissions, infection rates and decubitus [31-35].

The patient's perspective and risk detection

There is some evidence that patients are able to detect risks to patient safety. Two studies showed evidence of the ability of patients to identify medical errors and adverse events. Thus, patients can be used as partners in identifying poor and unsafe practice [36-38]. In fact, patient surveys can be used to predict the risk of malpractice [39]. Furthermore, using patient rating sites might help to detect poor performance [31, 34, 40-42]. However, some caution is needed given the methodological restrictions of patient rating sites [43].

Methods of measuring the quality of care from the patient's perspective

There are several ways of measuring the quality of care from the patient's perspective. These include satisfaction or experience surveys, patient-reported outcome measures, a single question such as the Net Promotor Score, and online patient rating sites. Satisfaction, as will be described below, contains subjective assessments of care. Measuring experiences tends to decrease this subjectivity by focusing on whether, according to patients, certain processes or events occurred during the delivery of care [44]. Furthermore, patient experiences with care would be influenced less by subjective expectations. The use of nationwide patient experience questionnaires, however, is a relatively recent development in the Netherlands. In this thesis the focus is put on the use of traditional patient satisfaction questionnaires and patient reviews placed on a patient rating website as outcome measures of patient-centred care.

Patient satisfaction

The first article that addressed the development of an instrument to measure the satisfaction of patients with the hospital care provided was published in 1957 [45]. Since then the concept of patient satisfaction has been part of a growing acknowledgment of the importance of consumer satisfaction as a measure of the quality of care. Different approaches have been proposed to understand the origin of patient satisfaction as will be described below.

The definition of patient satisfaction

Patient satisfaction refers to the cognitive evaluation of and the emotional reaction to the care provided [46]. It is defined in terms of the patient's *experiences* with care, that is to say their evaluations of what happened during the care they were provided with, as compared to their *expectations* of care, that is to say what people expect to receive from their health care. A patient's experiences are his or her direct, personal observations of the health care received. A patient's expectations are defined as the anticipation that given events are likely to occur during, or as an outcome of, health care. Both experiences and expectations are potentially important in influencing a patient's evaluations of care and thus his or her *'satisfaction'* [47].

The purposes of measuring patient satisfaction

Patient satisfaction is often used as an indicator of the quality of care. The measurement of patient satisfaction has different aims [3]. These are: (1) to describe health care services from the patient's point of view; (2) to identify problem areas and generate solutions; and (3), most importantly, to evaluate health care. Health care evaluation involves defining the objectives of care, monitoring health care inputs, measuring the extent to which the expected outcomes have been achieved, and assessing the extent of any unintended or harmful consequences of the intervention [3].

The psychological and theoretical approaches to satisfaction

Patient satisfaction has been given several conceptual frameworks. For instance, Ware [48] made a distinction between, on the one hand, objective and factual reports of the satisfaction achieved from providers and care, and, on the other, more subjective satisfaction ratings. These reflect a personal evaluation of care that cannot be known by observing care directly. This distinction reveals an important part of the criticism that satisfaction ratings do not correspond perfectly with the objective reality, or with the perceptions of care providers. For example, the perceived waiting time for an appointment by the patient may differ from the actual waiting time. However, Ware stated that this is, on the contrary, the unique strength of satisfaction. It brings new information. Differences in satisfaction reflect not only the realities of care, but also personal preferences and expectations. Ware stated that satisfaction is a multidimensional concept, determined by patient variables *(determinants: characteristics and expectations)* and organizational variables *(components)* [48].

Patient satisfaction theory is often based on the cognitive-phenomenological tradition developed by Lazarus and Folkman in their stress, appraisal and coping theory [49-51]. Hospitalization may lead to distress. In fact, it affects all patients, including those who do not have any psychological problems. Reach found five dimensions of hospitalization that cause distress in patients. These are: medical, trauma, environmental, interpersonal and social dimensions [52]. Larsson developed a theoretical approach to patient satisfaction based on the cognitive-phenomenological tradition [50, 51]. Patients have individual coping strategies. The way a person assesses and copes with a situation contributes causally to his or her emotional reaction [51]. This appraisal process consists of the interaction of actual, external conditions as well as conditions related to the individual person. These person-related conditions affect the person's belief system, that is his or her expectations and commitments or preferences. They include socio-demographic characteristics such as age, education and country of birth, the individual's self-rated health conditions and personality. Personality consists of the five major personality traits, extraversion, agreeableness, conscientiousness, emotional stability and autonomy [53]. The person-related conditions interact with external objective conditions such as the organization of care. Person-related conditions influence patient satisfaction most strongly [50, 51]. The appraisal and coping processes follow the perception of actual care and result in an emotional reaction called patient satisfaction [50, 51]. This chain reaction is shown in Figure 1.

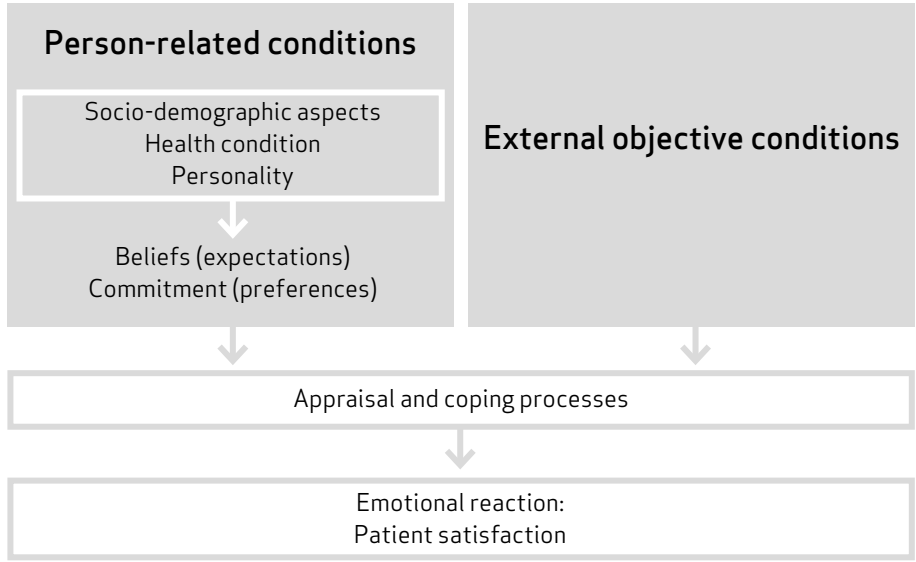

Figure 1 *The relationship between person-related conditions, external objective conditions, appraisal and coping processes, and emotional reactions (Adapted from Larsson) [51]*

It has been suggested that patient satisfaction is closely linked to the concept of expectations. Research has tried to explore, empirically, the relationship between expectations and satisfaction [4, 47, 54-58]. The concept of expectations is difficult to examine because it refers to notions of standard or aspiration. At least two elements influence the expectations of patients, the ideal circumstances of a highly industrialized country and the actual circumstances, created by the media, marketing, early experiences, or social network [47]. Expectations can vary according to knowledge, prior experience and patient characteristics, and are therefore mostly individual. Nevertheless, the fulfilment of expectations is, along with experiences reported by the patient, the most important predictor of patient satisfaction [54]. Indeed, meeting expectations correlates with higher satisfaction and results in better outcomes [4, 55-57]. It is therefore important to identify, as well as address, patient expectations [7, 56, 58]. A review conducted by Crow [59] showed that despite the importance of expectations, only 20 percent of studies considered this concept.
The involvement of patients in the development of a patient satisfaction instrument is therefore very important. After all, the patient's expectations have to be known before asking whether they were met [60, 61]. Although failure to identify patient expectations can lead to dissatisfaction, physicians and nurses often neglect to solicit the patient's expectations, and consequently may not be able to fulfil them [56]. This is what Rozenblum called 'the blind spot of patient satisfaction' [56]. Rozenblum suggested that health care organizations should take a more active role in increasing clinician's awareness of patient's expectations. Conducting training to cope with patient expectations and initiating structured programmes for managing patient expectations might in turn improve outcomes [56].

Patient satisfaction is seen as a multidimensional concept [48], or as an holistic approach to the patient's perspective. Holistic approaches try to include all the important predictors of patient satisfaction, thus providing a comprehensive framework for exploring interactions between variables that affect patient evaluations [54, 59].

Criticism of the concept of satisfaction

The concept of patient satisfaction has been criticized in research literature over the last decades. This is primarily because patient satisfaction is seen as an holistic, multidimensional concept, determined by both patient variables such as characteristics and expectations, and organizational variables. The concept is, therefore, thought to be difficult to measure [4, 62]. Critics state that patients have a complex set of important and relevant beliefs that cannot be embodied in simple questions related to satisfaction [4]. Avis found some evidence that patient's expressions of satisfaction were not related to the actual care processes. They were instead related to a response to psycho-social aspects of the health care encounter, such as relief, gratitude, fear of wasting the doctor's time, or confidence in the physician [63]. The multidimensional assessment is affected by individual's expectations, needs and desires. It is linked to prior satisfaction with health care, the patient's predisposition towards and use of health care, and the granting of patient's desires, health status and health outcomes. As such it is different for each individual [59, 62] and, therefore, it is complex to cover these issues comprehensively.

Secondly, the subjective nature of patient satisfaction causes discussion. Opponents argue that these subjective, personal components are hardly suited to a hospital's activities which are designed to improve quality [64]. Critics of the use of patient satisfaction questionnaires in the evaluation of health care mention that these represent patient's attitudes to care or aspects of care. Attitudes to services do not, in their view, explain much about the nature of the services and are therefore of less use for quality improvement [65]. Also, the usefulness of satisfaction surveys may be undermined by the suggestion that patient satisfaction has little, if anything, to do with care itself but originates in patient factors, such as knowledge or expectations [4]. Crow argues that patient satisfaction is a cognitive evaluation of the service that is emotionally affected, and therefore an individual's subjective perception. This subjective, affective component of the concept of patient satisfaction makes its measurement, Crow argues, 'probably a hopeless quest' [59, 66]. For instance, a patient with little knowledge of health care opportunities and with low expectations, can express high satisfaction even though poor care is provided. Thus, it is possible that what makes one patient satisfied might make another dissatisfied [62].

Thirdly, it is argued that patient satisfaction scores are usually quite positive and undifferentiated, and thus not sensitive to specific problems in the delivery of quality in care [65]. Hall and Dornan's meta-analyses [67] found average satisfaction levels of 76 per cent, Lebow [4] found on average 78 per cent satisfied patients, while Fitzpatrick [68] recorded at least 80 per cent of patients were satisfied. Saila and colleagues in their systematic review also found high or very high levels of satisfaction [69]. Likewise, Jenkinson found high levels of global satisfaction and willingness to recommend the hospital. Therefore, he concluded that global patient

satisfaction and recommendation scores present a limited and optimistic picture, not suitable for quality improvements [65].

Finally, in line with the above, patient satisfaction questionnaires have been criticized for failing to discriminate effectively between good and bad practice [65, 70]. For instance, patients are rarely asked about the effectiveness or outcomes of their treatment [65, 71, 72]. Moreover, most of the variation in performance is due to differences between patients rather than the differences between doctors [70]. Thus, patient satisfaction surveys were considered neither very sensitive nor useful when it comes to quality improvement [62, 64, 65].

Patient rating sites

In recent years, public reporting of the variability in the quality of care across health care providers has been promoted. Demonstrating differences across providers and physicians is intended to be a source for patients looking for care providers, stimulating patients to choose better performing providers. Such ratings should motivate providers to improve their quality of care. Therefore, public reporting is supposed to increase the overall standard provided by organizations and physicians [73, 74].

This trend towards greater public reporting combined with a corresponding patient demand for easily accessible information about physicians and providers, has resulted in the development of patient rating sites [73, 75]. Patient rating sites are websites on which patients can rate their health care organization or doctor on several aspects of care, adherence to clinical guidelines or structural information. Often those ratings are accompanied by a text explaining the ratings.
These websites have been established in many countries such as the US, UK, Germany, Canada, Australia, New Zealand and the Netherlands. There are good reasons to believe that these patient rating sites will become commonplace, especially as the next generation of patients grows up with the internet functioning as an important source for health care information [32, 34, 76-78]. Patients appreciate these rating sites because they provide information from peers [78]. A German study showed that approximately 65 per cent of the patients using a patient rating site had consulted a doctor based on these ratings [73]. A recent study in the US showed that an increase in the proportion of negative reviews led to a reduced willingness to use the physician's services [79]. In the Netherlands, the biggest patient rating site ZorgkaartNederland was visited by a million people per month, while the number of ratings increased from 206,000 in 2014 to 272,000 in 2015 [80].

Indeed, it is not only patients but also hospitals or other stakeholders who can use this new approach towards hearing the patient's perspective. It has become increasingly important for hospitals to profile themselves and to respond actively to reviews of patients because so many patients search for information on the internet and more frequently use patient rating sites. A study by Lagu showed that even patients who gave a positive rating mentioned aspects that hospitals could improve [81]. Thus, these rating sites have the potential to be an effective tool for improvements in the quality of hospital care and for the enhancement of patient-centred care [73, 81, 82]. Patient rating sites are also, increasingly, the subject of research, and a potential source for other stakeholders, such as health care inspectorates. Research mainly focuses on the characteristics of rating sites [73, 75, 76, 78, 83-85], the advantages and disadvantages of the use of rating sites as a source for quality improvement [31, 34, 40-43, 81, 82], the behaviour of patients when making choices [73, 79] and the associations with other quality indicators [31-35, 86]. Some health care inspectorates now use patient rating sites for monitoring the quality of care from the patient's perspective and for identifying potential risks to patient safety [34, 41, 42, 87].

Dilemmas raised about the use of patient rating sites

As patient rating sites have become more commonplace, discussions have arisen over the use of such data as a source for identifying the patient's perspective. Some objections are similar to the objections raised against the use of patient satisfaction assessment in general. One such example is the assumption that reviews on patient rating sites may be characterized by emotionally-driven texts. Other objections concern the validity of rating sites as a method for gathering the patient's perspective. The representativeness of rating sites, for instance, is questioned, especially among reviews written by patients who are very dissatisfied with the care they received. Rating sites could also be used for the blaming and shaming of physicians. Furthermore, some physicians might feel that either being criticized or even not rated at all is a heavy emotional burden to bear. Ratings sites are also supposed to be vulnerable to manipulation, for instance, through family or friends of the doctor who rate very positively, while they have never in fact been treated by the provider [32, 35, 40, 85, 88, 89]. Furthermore, the number of ratings is generally low, which means that the assessments of physicians may fluctuate widely over time [32]. A final objection against the use of rating sites is that they are not case mix-adjusted for patient characteristics. This is known to be necessary in order to prevent bias [90, 91].
However, with the number of ratings on rating sites rapidly growing, more and more

research is being carried out addressing patient rating sites. The results of this research increasingly contradict these objections and in fact show their merits. For instance, ratings are mostly positive [75, 78, 82, 85, 90] and correlate with relevant clinical outcomes, such as readmission, infection rates and decubitus [31-35, 86]. A German study showed that most English and German-language patient rating sites contain aspects of care, such as the organization of care, the expertise of the doctor and the doctor - patient relationship which also represent an important part of traditional surveys [92]. Several other studies showed that, for specific aspects, there was a significant correlation with traditional paper-based surveys. This included the overall score, or recommendation question, in the UK, US, Germany and the Netherlands [31, 40, 86, 93]. Thus, this new approach of looking at rating sites might indeed be another valuable source for those who want to have a closer look at the patient's perspective.

Outline of this thesis

The overall theme of this thesis is to contribute to the knowledge of how to use the patient's perspective for monitoring the quality of care, as measured in patient satisfaction research or patient rating sites.
This thesis is divided into three parts. In part I, the development and validation of two patient satisfaction questionnaires is described. In part II, three studies addressing the comparison of patient satisfaction scores between hospitals and over time are described. In part III, the exploration of a patient rating site as a tool for the health care inspectorate to identify risks is described.

Part I The development and validation of patient satisfaction questionnaires
Chapter 2 describes the development and validation of the Core Questionnaire for the Assessment of Patient Satisfaction (COPS) and its use in three nationwide studies in inpatient and outpatient departments of Dutch university hospitals.
The group of patients receiving treatment in a day care setting instead of remaining in hospital for a number of days increases each year and therefore monitoring the quality of care in this setting becomes increasingly important. The day care environment differs in some aspects from inpatient and outpatient departments. **Chapter 3** describes the development and validation of the day care COPS (COPS-D), in order to give a voice to patients in the day care organization in hospitals.

Part II A comparison of patient satisfaction scores between hospitals and over time
Hospitals differ in their organization of care and in their patient population. It is necessary to establish which characteristics are influencing patient satisfaction scores when comparing hospitals in order to identify aspects of quality improvement. These characteristics should then be corrected for. **Chapter 4** evaluates which characteristics of hospitals, departments and patients influence the scores for patient satisfaction. These factors should be used when correcting for case mix before benchmarking hospitals in order to make improvements in the quality of their care.
A good quality of care is reflected in high scores for patient satisfaction and a shorter length of stay in the hospital. **Chapter 5** describes a study investigating the correlation between patient satisfaction scores and length of stay among seven hospital departments in a national setting.
Finally, it could be useful for hospitals to monitor their patient satisfaction research over time. This is because hospitals may make quality improvements based on the results from research into patient satisfaction. However, it often takes time to implement such improvements in daily care processes. **Chapter 6** describes a trend analysis of patient satisfaction scores in the eight Dutch university hospitals, with the focus on trends, effect sizes and consequences for improving patient-centred care.

Part III Patient rating sites as a new development in monitoring the quality of care
The use of patient rating sites for measuring quality of care has been increasing in recent years. This is not only to enable hospitals to monitor their patient's assessments, but also for other stakeholders, such as the health care inspectorate, to do so as well. **Chapter 7** describes whether and how patient reviews of a rating site have the potential to identify risks to patient safety and therefore contribute to health care inspector's daily supervision of hospital care.

Finally, **Chapter 8** provides a summary, a discussion of the results and implications for practice together with an agenda for future research.

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The development and validation of patient satisfaction questionnaires

A core questionnaire for the assessment of patient satisfaction in academic hospitals in the Netherlands

Development and first results in a nationwide study

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Published as: Kleefstra et al. BMJ Quality and Safety 2010 19:e24 DOI: 10.1136/qshc.2008.030825

Abstract

Background
Patient satisfaction is one of the relevant indicators of quality of care; however, measuring patient satisfaction had been criticised. A major criticism is that many instruments are not reliable and/or valid. The instruments should have enough discriminative power for benchmarking the results.

Objective
To develop a 'core questionnaire for the assessment of patient satisfaction in academic hospitals' (COPS) that is reliable and appropriate for benchmarking patient satisfaction results.

Methods
The development of the COPS, the testing of its psychometric quality and its use in eight Dutch academic hospitals in three national comparative studies in 2003, 2005 and 2007 are described in this study. Results were reported only if they were significant ($p<0.05$) and relevant (Cohen's $d>0.2$).

Results
The questionnaire was returned in 2003 by 40,678 patients (77,450 sent, 53 per cent) and by 40,248 patients (75,423 sent, 53 per cent) in 2005. In 2007, the questionnaire was returned by 45,834 patients (87,137 sent, 53 per cent). The six dimensions have good Cronbach α's varying from 0.79 to 0.88. The results of every item were reported to the individual hospital. A benchmark overview showed the overall comparison of all specialties of the eight hospitals for the clinic and outpatient departments. The 2007 measurement showed relevant differences in satisfaction on two dimensions in the clinical setting.

Conclusions
COPS is shown to be a feasible and reliable instrument to measure the satisfaction of patients in Dutch academic hospitals. It allows comparison of hospitals and gives benchmark information on a hospital as well as data on specialty levels and previous measurements, including best practices.

Introduction

Patient satisfaction is an important indicator to establish the quality of care [1-6]. Indeed, hospitals all over the world measure patient satisfaction to improve the quality of their care [7-14]. More specifically, patient satisfaction feedback helps health care providers to identify potential areas for improvement which in turn can increase the effectiveness of health care systems [15, 16]. Satisfied patients are important for hospitals as they are more likely to return, to comply with medical treatment and to recommend the hospital to others [2, 16-18].

Measuring patient satisfaction has also been criticised [15, 19, 20]. One major criticism is that many instruments for measuring patient satisfaction are not reliable and/or valid [21, 22]. Also, a recent study showed no significant association between patient satisfaction and quality of care [23]. Patient satisfaction surveys are often not followed by changes in medical provider behaviour or hospital care [9]. Measuring patient satisfaction was also criticized for not discriminating between hospitals [6, 14, 24]. These should be able to put their satisfaction ratings into perspective rather than having them for their own individual hospital only [12]. The instruments should therefore have enough discriminative power for benchmarking the results between hospitals.

While realising the advantages and limitations of patient satisfaction research, the eight academic hospitals in the Netherlands decided in 2002 to develop a reliable and valid instrument to compare the satisfaction of their patients throughout the country. They wanted a short, core instrument to screen patient satisfaction, based on the needs of patients in academic hospitals. Such instrument would provide them with the possibility of being open about their patient's judgements. Several questionnaires had been developed earlier yet, most of these were not suitable for the goals described.

In this article, we describe the ***development*** of the 'Core questionnaire for the assessment of patient satisfaction in academic hospitals' (COPS) and its preliminary psychometric testing. We also describe the ***experience*** with its use in three national comparative studies among the eight academic hospitals in 2003, 2005 and 2007.

Methods

Development

First, relevant content areas were selected by comparing the existing surveys on patient satisfaction in academic hospitals. To provide a mutual framework, the content was analysed against a study performed by the Dutch National Patient Platform. The study defined preliminary criteria for patient care quality in hospitals [25]. Seven elements had been formulated: 1) *accommodation*, 2) *organisation*, 3) *professional skills*, 4) *information*, 5) *communication* 6) *support* and 7) *autonomy*. A list of 72 care elements covering these areas could be made. This list was given to 44 representatives of different patient organisations relevant for academic hospitals. They were informed about the study aim by letter and invited to indicate importance levels for the different times on a questionnaire during their regular board meeting. Representatives who were absent were invited to complete the questionnaire at home. The level of importance could be scored on an eleven point response format varying from 'not important' to 'the most important'.
Second, we used existing data from a survey instrument used in the Academic Medical Centre in Amsterdam as a first basis for creating the item wordings [26]. Patients (N=784) from different departments were included in the sample. They had received a questionnaire at home up to three months after discharge. The questionnaire covered twelve elements of hospital care represented in 54 questions. Earlier findings indicated that responses should preferably be formulated in terms of satisfaction [26]. Therefore, 5-point Likert type scales with answering categories unsatisfied (=1), somewhat satisfied (=2), rather satisfied (=3), quite satisfied (=4), very satisfied (=5) were used. An intentionally skewed wording of answering categories was chosen, like the SF-36 [27], as patients are likely to give answers to positively framed responses rather than to negative ones.
Additionally, patients had been asked to indicate how satisfied they were with the care overall and whether they would recommend the hospital to others.
Third, the psychometric properties of the COPS were tested in the Leiden University Medical Centre (LUMC). The COPS was sent to 4,693 patients from 25 inpatient wards of the LUMC within three months of discharge (about 190 questionnaires per department). Similarly, questionnaires were sent to 5,326 patients having visited the hospital's outpatient department.

Experience

The COPS was used in three large scale nationwide comparative studies in all eight academic hospitals in the Netherlands in 2003, 2005 and 2007. The study sample was stratified according to the 17 of the 27 main medical specialties in the Netherlands. Two hundred consecutive patients were approached from every department given an expected non-response of 50 per cent and the wish to obtain questionnaires from 100 patients per department for analysis eventually. A coordinator was appointed in each academic centre and instructed to ensure a comparable approach across the eight centres. The central study office provided a manual for data collection procedures and organised instruction meetings for the coordinators. Because we worked with a core questionnaire, hospitals were allowed to add additional questions if desired.

In 2003 and 2005 the COPS was sent to patients within two months after admission or an outpatient visit, accompanied by a letter from that patient's hospital. Specific information was given in this letter in English, French, German, Turkish, Moroccan and Spanish inviting patients to ask the help of others in case they were unable to read Dutch. Questionnaires could be returned to the independent research organisation Prismant in a prestamped return envelope. A reminder was sent after two weeks. A helpdesk using phone and email was installed for patients needing support. In 2007 patients were also offered the possibility to complete the questionnaire online. A personal code was given in the letter. It remained possible to send the questionnaire back by mail. Patients were invited to give their comments on the questionnaire, if desired.

Analysis

Development

To select content the judgements by the different respondents were analysed and ordered in a so-called norm analysis [28]. The items were scored on a psychological scale. The item with the highest score was considered to be most important for the patient representatives.

To select items, 10 items of the original 54 questionnaire items were omitted due to either local specificity, a relatively high number of missing values or a skewed distribution. A factor analysis was done to establish the structure of the questionnaire and the loading of the individual items on possible factors. We decided to select only those factors that were reliable after rotation ($\alpha > 0.72$).

To select items in the relevant domains, regression analyses were done for each element. The items were formulated as dependent variable to predict the patient's overall satisfaction as well as their intention to recommend the hospital to others.

Experience

In the nationwide studies we compared two groups, for example patients treated by a specialty in a hospital with the other specialities in the same hospital, by using T-tests. We only reported the results if they were significant ($p < 0.05$ after correction for the number of tests) and relevant (Cohen's $d > 0.2$). A hospital was reported as a best practice if its results were the best and the difference with others more than one standard deviation.

Results

Development

The item content relevance questionnaire was completed by 36 representatives (82 per cent). Representatives displayed a high level of agreement regarding the (un)importance of most items. We selected the 25 items considered 'most important'. These were related to *information* (10 items), *organisation* (5 items), *communication* (5 items), *having professional skills* (3 items) and *autonomy* (2 items). Items regarding *accommodation* and *perceived support* were considered less important. The results were discussed in a meeting with the patient representatives who confirmed their relevance.

To select the items we included data from the 784 patients who responded into the analysis. The factor analysis exploring the structure of the original questionnaire yielded two factors explaining 26 per cent and 16 per cent of the variance respectively. The first factor ($\alpha = 0.85$) referred to disease and treatment related elements of care. It covered *hospital admittance, nursing care, medical care, information, autonomy* and *discharge*. The second factor ($\alpha = 0.75$) referred to other elements of care such as *hotel facilities* and *accessibility*. Given the concordance of these results with the results of the study determining the relevance of content areas, we decided to proceed with the elements involved in the first factor only.

The two most relevant items for every element, as selected in the regression analyses, are given in Table 1. If the order of items was different in the two regression analyses, three items are represented in the table.

As comparable content areas were found to be relevant in both studies and the factor analysis gave similar results, we decided to combine the results of the two studies.
First, as *information giving* was found to be the most important aspect when distinguishing relevant content areas, it was given extra attention in the final questionnaire. Second, communication was brought under the heading of both *medical* and *nursing care*. Similarly, expertise, or, professional skills were assessed under these headings in two questions. Thus, scales covering *medical* and *nursing care* were proposed. Thirdly, the organisation was covered under two headings: 1) *admission* and 2) *discharge*. As the questionnaire was to be feasible in clinical and outpatient departments, the questions regarding *admittance* were transformed in questions covering the *reception* in the outpatient clinic. Finally, the element *autonomy* was kept as proposed in the original questionnaire. Yet, patient representatives were found to value confidentiality and/or privacy highly. These issues were not covered in the original questionnaire and were therefore added to the *autonomy* scale.

Table 1 *Regression analysis to select the two most relevant items for every satisfaction domain (element)*

	Overall satisfaction with care		Intention to recommend hospital	
Care element and most predictive items	**R**	**β**	**R**	**β**
Admission procedure				
information provided by nurse upon admission	.52	.30	.41	.19
reception at the ward	.57	.24	.38	.26
Nursing care				
expertise of the nursing staff	.56	.22	.44	.14
the way nurses helped patients when asked for help	.62	.17	.40	.20
the way nurses treated patients	.64	.15	.43	.15
Medical care				
the way doctors and nursing staff get along	.56	.30	.46	.26
doctor's expertise	.61	.20	.50	.18
Information				
approachability of hospital staff in case of questions	.56	.23	.46	.16
the way information was transferred from one person to another	.64	.24	.48	.15
the amount of information	.67	.20	NI[1]	NI
clarity of information given by doctors	NI	NI	.42	.26
Patient autonomy				
patient ability to participate in treatment decisions	.53	.33	.42	.42
patient being encouraged to be self-sufficient	.57	.29	NI	NI
Discharge and aftercare				
the way information was passed on (to G.P. etc.)	.57	.27	.42	.31
information provided regarding further treatment	.63	.14	NI	NI
the timing of discharge from hospital	.64	.12	.44	.18

The overall response rate for testing the psychometric properties in the LUMC clinical departments was 55 per cent (N=2,581). Women and patients over 45 years were overrepresented in the group of responders. The response rate in the outpatient clinic was 53 per cent (N=2,823). In this group patients over 45 were overrepresented as well, but men and women did not differ in response rate.
The reliabilities of the scales are given in Table 2. All scales had a good reliability (α = 0.79- 0.88).

1 *NI = Not included in the regression model*

Table 2 *Reliability of satisfaction scales (Cronbach's alpha)*

Scale	Number of items	Reliability in clinical departments	Reliability in outpatient departments
Reception/admittance	2	.82	.86
Nursing care	2	.85	.85
Medical care	2	.86	.88
Information giving	4	.85	.88
Autonomy	3	.80	.86
(Discharge &) aftercare	(3) 2	.85	.79

Experience

For the nationwide studies the questionnaire was returned in 2003 by 40,678 patients (77,450 sent, 53 per cent) and by 40,248 patients (75,423 sent, 53 per cent) in 2005. In 2007 the questionnaire was returned by 45,834 patients (87,137, 53 per cent). Less than 5 per cent of the patients, both from the inpatient and outpatient setting, completed the questionnaire on the internet in 2007. The response rates and patient characteristics for inpatients and outpatients are given in Table 3.

Table 3 *Patient characteristics of the three nationwide studies in percentage*

		Response	Male	>60 years	High education	Good health status
2003	*inpatient*	*53*	*50*	*37*	*29*	*66*
	outpatient	*52*	*44*	*34*	*33*	*63*
2005	*inpatient*	*55*	*49*	*40*	*30*	*66*
	outpatient	*52*	*44*	*36*	*35*	*65*
2007	*inpatient*	*55*	*49*	*41*	*31*	*66*
	outpatient	*51*	*45*	*38*	*35*	*65*

They differed across the hospitals varying from 40 per cent to 61 per cent in 2003, from 44 per cent to 66 per cent in 2005 from 41 per cent to 64 per cent in 2007 after excluding questionnaires that were damaged, not readable or lacked essential data.

Reliabilities of the scales are given in Table 4. Also in the overall benchmarks, all scales had a good reliability (α = 0.70–0.91). The highest internal consistency is seen in the scale covering *medical care*, the lowest in the scale covering *patient autonomy*.

Table 4 *Reliability of scales in the large scale comparative study (Cronbach's alpha)*[2]

Scale	Number of items	Reliability in clinical departments			Reliability in outpatient departments		
		2003 (N = 16,924)	2005 (N = 16,904)	2007 (N = 16,937)	2003 (N = 23,493)	2005 (N = 23,344)	2007 (N = 27,523)
Reception/admittance	2	.83	.84	.85	.89	.89	.88
Nursing care	2	.87	.87	.87	.88	.89	.88
Medical care	2	.86	.86	.87	.90	.91	.90
Information giving	4	.87	.88	.87	.86	.87	.86
Autonomy	3	.80	.80	.80	.70	.70	.70
Aftercare	(3) 2	.85	.85	.84	.74	.73	.73

The satisfaction scores of the nationwide studies are shown in Table 5. In the inpatient setting patient's satisfaction with *medical care* and *discharge and aftercare* increased during the years. It remained stable for the other dimensions. In the outpatient setting the mean of all six dimensions increased during the years. These are significant increases ($p<0.05$) but not relevant (Cohen's $d>0.2$). In neither the clinical nor the outpatient setting patient's satisfaction decreased over time in any dimension.

2 *numbers after excluding not usable questionnaires*

Table 5 *Scale scores (mean) of the three nationwide studies*

		Admission procedure	Nursing care	Medical care	Patient autonomy	Information	Discharge
2003	Inpatient	4.0	4.0	4.0	3.8	3.6	3.5
	outpatient	3.9	3.9	4.1	3.8	3.7	3.4
2005	inpatient	4.0	4.0	4.0	3.8	3.7	3.5
	outpatient	3.9	3.9	4.1	3.8	3.7	3.4
2007	inpatient	4.0	4.0	4.1	3.8	3.7	3.6
	outpatient	4.0	4.0	4.2	3.9	3.8	3.5

All the study results were presented to hospitals and public in reports and by internet. Every item was reported to the individual hospitals as part of the confidence interval or not as shown in Figure 1.

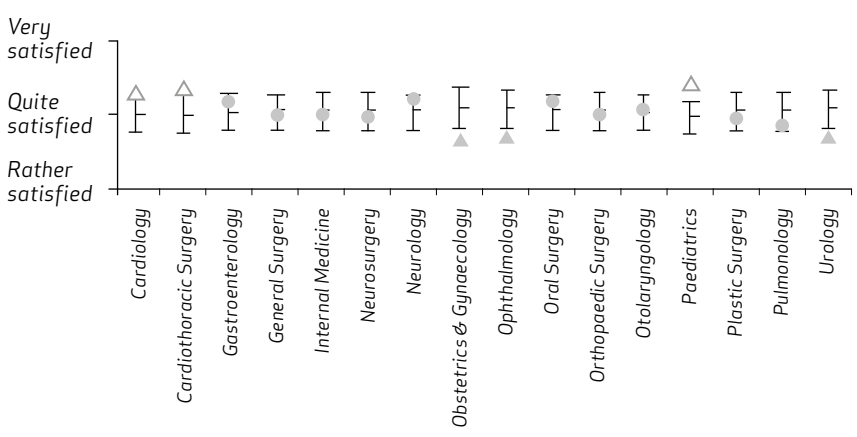

Figure 1 *Patient satisfaction on the dimension medical care*

Mean score (black stripe in the middle) on the dimension medical care with the confidence interval (95 per cent). Triangle means outside CI, positively and negatively, respectively.

For a benchmark overview we presented the overall comparison of all the specialties of the eight hospitals for the clinic and the outpatient departments (Table 6 gives an example of the inpatient benchmark 2003). Several specialties could be assigned as best practices. In the first two measurements (2003 and 2005) no relevant differences in satisfaction on any hospital level were found. The third measurement (2007) showed relevant differences in satisfaction on two dimensions in the clinical setting for one hospital, namely on *information* and on *patient autonomy* ($p < 0.05$ and Cohen's $d > 0.2$).

Table 6 *Overview best practices in patient clinic 2003 for all the 17 specialties on every element*

Specialities	Hospital 1	2	3	4	5	6	7	8
Cardiology								
Cardiothoracic surgery								
Gynaecology and Obstetrics					● ★			
General surgery					▲			
Internal Medicine				▲				
Otolaryngology (ENT)	○							
Paediatrics		○					● ★	
Pulmonology					▲ ⬠ ★			
Gastroenterology				×				
Neurosurgery	● ▲ ⬠						×	
Neurology								
Ophthalmology	⬠ ×					●		
Orthopaedic surgery	○ ★							
Plastic surgery								
Urology								

● = reception/admittance
○ = nursing care
▲ = medical care
⬠ = information
★ = patient autonomy
× = discharge and aftercare

Discussion

Although the items in the COPS seem to be comparable to items used in several existing questionnaires, most of these questionnaires were not suitable for the goals of the eight academic hospitals: a short, reliable and a valid core instrument to screen patient satisfaction, based on the needs of patients in Dutch academic hospitals. This study shows that the COPS is a feasible and reliable instrument to measure the satisfaction. It proved useful in comparing hospitals, it provides hospitals with benchmark information on a hospital as well as a specialty level, and can distinguish best practices. The response rates are average compared to the international response rates (from 74 per cent in Germany to 46 per cent in the USA) [29].
In practice, some hospitals used the information obtained for interventions to improve patient satisfaction. For example, the Radboud University Nijmegen Medical Centre made, based on the results of the measurement of 2003, a checklist to improve the communication between doctors and nurses on the department of Gastroenterology [30].

Use by general hospitals

Since 2004 several Dutch general hospitals also started using the COPS as an instrument for measuring their patient's satisfaction. Because the dimensions and items of the COPS were originally compared against a framework for patient satisfaction in general hospitals, it was reasonable to assume that the COPS is also a feasible and valid instrument for general hospitals. Therefore, the Federation of Dutch Hospitals (NVZ) accepted the COPS as a standard instrument in hospitals. The NVZ only added one item assessing overall satisfaction measured with a 10-point rating scale. Nowadays, most hospitals in the Netherlands are using the COPS.

Limitations of the study and future research

A number of study limitations can be mentioned. First, we could not investigate the characteristics of our non-response. Thus, especially the extremely (dis)satisfied patients may have returned the questionnaire. However, former research showed that the impact of non-response bias on comparisons between hospitals is small [31].

Second, it can be argued that our satisfaction scores were high, as in most satisfaction researches and may be too high to function as a basis for improvement. Moreover, it has been suggested that these high scores are not always an indication that patients have good experiences [7, 14, 20, 32]. Our results indeed show high scores in some dimensions but there is still is room for improvement, especially in the dimensions *information* and *aftercare and discharge*, and the departments with a significant lower patient satisfaction than the benchmark. One should also consider that it is difficult to measure dissatisfaction in a health care system where most consumers are very satisfied [33].

Third, all eight hospitals used the information from the patient satisfaction benchmark to make improvements [30, 34, 35]. The measurements actually showed increased satisfaction in some cases. An effect study to assess whether there was a direct relationship between the improvements hospitals made and increased satisfaction could not be performed. There is hardly any evidence for such relation in the literature which makes it an important topic in future research to explore. Nevertheless, the academic hospitals are satisfied that their idea for a short, reliable, valid and discriminating questionnaire for measuring patient satisfaction proved feasible.

Author's contributions

Concept and design (SK, TK, CV, AW, MM, GB, JH), collection of the data and literature (SK, AW, CV), statistical analysis and interpretation of the data (SK, CV), drafting of the manuscript (SK, TK, CV, AW, JH), critical revision of the manuscript (TK, MM, GB, JH), supervision (JH). All authors read and approved the final manuscript.

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An instrument assessing patient satisfaction with day care in hospitals

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Published as: Kleefstra et al. BMC Health Services Research 2012, 12:125 DOI: 10.1186/1472-6963-12-125

Abstract

Background
Patient satisfaction is an important indicator of quality of care in hospitals. Reliable and valid instruments to measure clinical and outpatient satisfaction already exist. Recently hospitals have increasingly provided day care, i.e., admitting patients for one day without an overnight stay. This article describes the adaption of the 'Core questionnaire for the assessment of Patient Satisfaction' (COPS) for general Day care (COPS-D), and the subsequent validation of the COPS-D.

Methods
The clinical COPS was supplemented with items to cover two new dimensions: *Pre-admission visit* and *Operation Room*. It was sent to a sample of day care patients of five general Dutch hospitals to investigate dimensionality, acceptability, reliability, construct and external validity. Construct validity was established by correlating the dimensions of the COPS-D with patient's overall satisfaction.

Results
The COPS-D was returned by 3,802 patients (response 46 per cent). Factor analysis confirmed its structure: *Pre-intake visit*, *Admission*, *Operation room*, *Nursing care*, *Medical care*, *Information*, *Autonomy* and *Discharge and aftercare* (extraction communality 0.63-0.90). The internal consistency of the eight dimensions was good (α = 0.82-0.90); the item internal consistency corrected for overlap was satisfactory (>0.40); all inter-item correlations were higher than 0.45 but not too high (<0.90). The construct validity of all dimensions was good (r from 0.52-0.62, p<0.01). The *Information* dimension had the strongest correlation with overall day care satisfaction.

Conclusions
The COPS-D is a reliable and valid instrument for measuring satisfaction with day care. It complements the model of measuring patient satisfaction with clinical and outpatient care given in hospitals. It also fulfils the conditions made while developing the clinical and outpatient COPS: a short, core instrument to screen patient satisfaction.

Introduction

In recent years hospitals have increasingly been providing day care, i.e. the admission of patients to a hospital during one day without an overnight stay. OECD figures show an increase of day care surgical procedures of 121 per cent in the period between 2000 and 2007 in seven European countries and Australia [1]. Substitution of clinical care by day care can have several consequences for the hospital. It often results in new centres with a different philosophy and logistics. For instance, hospitals can rationalise their inpatient bed utilization with reduction of admissions and intra-treatment transfers [2-4]. A study on technological innovations in surgery showed that as more patients were treated on an outpatient basis, fewer hospital beds were needed, and traditional operating rooms had to adapt to a greater turnover of patients. In addition, postoperative care is carried out in the community rather than in hospitals [2-4]. Also reduction of costs is mentioned as a result of substituting day care for clinical care [2-8].

Day care admissions may have advantages from the patient's perspective such as prevention of hospitalization, decrease in waiting times and a more rapid recovery. Patients prefer to recover at home because it disturbs their lives minimally [5]. It is generally appreciated by patients that they can sleep at home and come to the clinic only a few hours before the procedure takes place [8]. Besides, different studies showed good clinical outcomes when clinical care was replaced by day care for totally different specialities like geriatrics, oncology, neurology, surgery and ophthalmology and the treatment of venous thrombosis or laparoscopic cholecystectomy [2, 4-8]. Also day care may lead to fewer hospital-related infections [8]. Geriatric day hospitals for instance helped to avoid or shorten hospitalization and might contribute to the return of the patient to his home setting by facilitating the patient's autonomy and the quality of life [7]. The availability of different medical and paramedical staff for frail elderly was a major advantage [6].

Day care treatment may also have disadvantages for patients. They may feel abandoned or unsafe or feel they are being sent home 'too early' [3, 4]. Patients discharged within 24 hours after surgery might be at risk for early complications or readmission [3]. Parents of oncology patients reported inadequate information concerning appropriate home care and possible patient reactions, a lack of privacy and an increase of anxiety connected with having to take over too much responsibility [9]. Day care patients experience significantly higher levels of pre-operative stress and anxiety than do inpatients [8]. Another disadvantage mentioned in the literature is the number of examinations in geriatric hospitals in one day. This might be stressful and exhausting for elderly patients [7]. Finally, special attention is needed for patient-centred discharge procedures to prevent rehospitalisation [10]. Coping post discharge is a source of concern for patients, particularly if living alone. Patients need to be reassured and confident that they have access to further advice if required [5].

The experiences of patients with day care are therefore important when hospitals evaluate quality of their care [11, 12]. In the Netherlands since 2004 almost all hospitals are using the same patient satisfaction questionnaire for clinical and outpatient settings, the so called Core Questionnaire for the assessment of Patient Satisfaction (COPS). This is a valid and reliable questionnaire for clinical and outpatient settings [13]. It provides benchmark information on a hospital as well as speciality level, including information on best practices. Reliability and validity of the COPS support the use of this questionnaire in assessing quality improvement interventions [14].
Over the last few years, more and more hospitals in the Netherlands indicated their need for a valid and reliable instrument to measure patient satisfaction with day care admissions. The existing patient satisfaction questionnaire COPS was not developed for measuring satisfaction of day care patients and lacked important issues relevant to this patient group.

After interviewing fifteen hospitals, including the eight academic hospitals, and a review of international literature, we concluded that, to the best of our knowledge, a valid questionnaire for day care satisfaction did not exist. Therefore, we decided to develop and validate a patient satisfaction questionnaire especially for day care admissions, based on the COPS. In this paper we describe the development and psychometric properties, i.e., the dimensionality of the COPS-Day care (COPS-D), by testing the acceptability, the reliability and the construct validity. To support construct validity we expect a moderately strong relation between the dimensions of the COPS-D and patient's overall rate of satisfaction.

Methods

Instrument

We composed a questionnaire for day care patients, based on the COPS [13]. The COPS is a short core questionnaire to measure patient satisfaction, based on the

needs of clinical patients and outpatients of academic hospitals. The questionnaire was developed to compare satisfaction scores between hospitals, and to identify opportunities for quality improvement.
The COPS consists of six dimensions, each dimension is covered by two, three or four questions: *Admission procedure* (3 items), *Nursing care* (2 items), *Medical care* (2 items), *Information* (4 items), *Autonomy* (3 items) and *Discharge and aftercare* (3 items).

For the COPS-D we included the six dimensions (17 items) of the COPS, assuming that these dimensions are as relevant to day care patients as they are to clinical and outpatients. In addition, we asked quality staff members of five general hospitals that had indicated a need for a day care patient satisfaction questionnaire to indicate which questions they found necessary to add in order to measure patient satisfaction in their day care organisation. Based on the needs formulated we added two new dimensions to the existing six dimensions from the COPS: *Operation room* (6 items) and *Pre-admission visit* (4 items). See Appendix for the items used. In total the COPS-D consists of 27 questions. The same answering categories were used as in the COPS: a 5-point Likert-scale (1=unsatisfied, 2=somewhat satisfied, 3=rather satisfied, 4=quite satisfied and 5=very satisfied). A dimension score is composed by adding the item scores and dividing the resulting total score by the number of items.

Besides the COPS-D, the questionnaire includes an overall rate for satisfaction with the patient's treatment and stay in the hospital (range 0 unsatisfied to 10 very satisfied), and questions to assess patient's background characteristics (i.e., age, gender, level of education) and a rating of perceived health status (bad, moderate, good, very good, excellent).

Procedure

The COPS-D was tested in the five participating hospitals between November 2005 and May 2008 by sending a questionnaire to a sample of day care patients. We randomly selected 200 patients of each participating day care specialty who had visited the day care facility within the last six months. They received the questionnaire at home, accompanied by a letter from the hospital informing them about the questionnaire's background. The questionnaire could be returned to an independent research institute in a pre-stamped envelope. A reminder was sent after two weeks. A helpdesk using phone and email was installed for patients needing support.

Analyses

First we calculated the **correlations** of the newly added dimensions *Operation room* and *Pre-admission visit* with the original COPS-items. If these correlations were higher than 0.7, the items in the dimensions *Operation room* and *Pre-admission visit* might be measuring the same concept as the original dimensions in the COPS could be deleted without loss of information.

We tested the **construct validity** of the eight dimensions using a confirmatory principal component factor analysis with varimax rotation and eigenvalues greater than 1 [15]. We calculated extraction communalities as estimates of the variance in each variable accounted for by the factor. Small values indicate variables that do not fit well with the factor solution. The communality fits with a threshold of more than 0.4 [14]. We also investigated the Measures of Sampling Adequacy (MSA). This statistical analysis tests whether the sample fits the a priori defined model. If values are lower than 0.5 this may indicate that the variable does not seem to fit with the structure of the other variables.
Construct validity was also tested by calculating Spearman's rank correlation coefficients of the eight dimensions with each other and with the overall satisfaction. A ρ-value ≥ 0.5 is considered to represent a strong correlation; 0.35 to 0.5 a moderate correlation; and 0.2 to 0.34 a weak correlation [16].

We tested the **reliability** of each dimension by calculating the Cronbach's α. The α should preferably be higher than 0.7 [17, 18]. In addition, we calculated the inter-item correlations and the item-total correlations (ITC) corrected for item overlap (item internal consistency). The inter-item correlations within a dimension should preferably be ≥ than 0.45. If the inter-item correlations are high (0.6 or 0.7), this indicates that 3 to 5 items will suffice in the dimension. If the inter-item correlations tend to be low (0.3 or 0.4), more items must be added to the dimension with a minimum of 7 to yield acceptable α's [17]. Too high inter-item statistics (≥ 0.9) can indicate a redundancy of an item. Item-total statistics show the Cronbach's α if an item is deleted: if this α is higher, the item should preferably be deleted. Also the item internal consistency should be larger than 0.4 [18]. We reported floor and ceiling effects to assess the skewness of the scores. The floor effect refers to the percentage of patients giving the worst possible score (namely 1 = unsatisfied). The ceiling effect refers to the percentage of patients giving the highest possible score (namely 5 = very satisfied).

Next, we tested the item discriminant validity (IDV). We correlated the items with the dimensions. The items should correlate more strongly with the dimension they are supposed to fit in than with the other dimensions [19].

Next, we checked the **external validity** of the sample used: whether the results can be extrapolated to the population of day care patients [20]. We compared the figures of the Dutch National Medical Registration (LMR) [21] on day care admissions in 2008 of the same eight specialties on gender and age with our sample. We expect that the results can be extrapolated based on our sample.
Furthermore, we tested **known group differences** using an ANOVA with a Bonferroni post hoc analysis. We expect elderly, lower educated and healthier patients to report higher overall satisfaction on all dimensions. We also expect that gender does not have a significant effect on all dimensions [12, 22, 23].

Finally, we tested the **acceptability** of the questionnaire by checking response rates and the missing values. The answering category 'not applicable' was excluded from the analyses. Items with a relatively high number of missing values (more than 10 per cent) must be avoided [24, 25] and might be left out of the basic questionnaire as they may not be applicable or relevant.

Data were analysed used IBM SPSS 15.0.

Results

Sample

The COPS-D was sent to 8,355 patients discharged from a day care unit from the five general hospitals. In total, 3,802 patients returned and completed the questionnaire. The average response rate was 46 per cent (range from 38 per cent till 60 per cent).

Table 1 *Patient characteristics (N=3,802)*[3]

Item	Characteristic	N (Percentage)
Gender	Female	2,025 (53%)
	Male	1,677 (44%)
Age	Younger than 20 years	234 (6%)
	20-59 years	1,776 (47%)
	60 years or older	1,754 (46%)
Education	Lower level	2,647 (70%)
	Higher level	1,013 (27%)
Health status	Bad/moderate	843 (22%)
	Good, very good, excellent	2,412 (63%)
Specialty	Surgery	612 (16%)
	Internal Medicine	474 (13%)
	Orthopaedics	437 (12%)
	Gynaecology and Obstetrics	318 (9%)
	Ophthalmology	310 (8%)
	Ear Nose Throat-surgery	287 (8%)
	Cardiology	276 (7%)
	Urology	206 (6%)
	Other (less than 5% per specialty)	830 (22%)

3 *Numbers do not always add up to 3,802, due to missing values*

Dimensions Operation room and Pre-admission visit

Three items of the dimension *Operation room* correlated highly (> 0.7) with two items of the COPS, 'Personal attention surgeon' (correlation 0.742 with 'Personal attention doctor'), Information surgeon' (correlation 0.715 with 'Personal attention doctor') and 'Transfer of information' (correlation 0.708 with 'Transfer of information').
The correlations found in the dimension *Pre-admission visit* were all weaker than 0.627.

Construct validity and reliability

The confirmatory factor analysis confirmed the structure of eight dimensions. 73 per cent or more of the variance was explained by the dimensions (range 73.3 per cent to 89.8 per cent, mean 79 per cent,) see Table 2. All items showed an extraction communality ≥ 0.45 (range 0.634 to 0.898). All items showed a MSA ≥ 0.5 (range 0.651 to 0.889).

Table 2 *Factor analysis*

Dimension and items	N	% variance	Extraction	COPS or COPS-D	Measures of Sampling Adequacy (MSA)
Pre-admission visit	**1,243**	**77.9%**		**COPS-D**	
Reception	1,243		0.739		0.861
Personal attention	1,243		0.801		0.806
Expertise	1,243		0.808		0.799
Information and instruction	1,243		0.769		0.849
Admission	**1,807**	**78.8%**		**COPS**	
Reception	1,807		0.747		0.782
Rapidity of being able to speak to	1,807		0.825		0.688
Degree of support	1,807		0.790		0.724
Operation Room	**1,307**	**81.2%**		**COPS-D**	
Reception	1,307		0.813		0.726
Personal attention operation staff	1,307		0.860		0.675
Expertise operation staff	1,307		0.766		0.796
Nursing care	**3,691**	**89.8%**		**COPS**	
Personal attention	3,691		0.898		0.5
Expertise	3,691		0.898		0.5
Medical care	**3,355**	**89.7%**		**COPS**	
Personal attention	3,355		0.897		0.5
Expertise	3,355		0.897		0.5
Information	**3,126**	**73.3%**		**COPS**	
Information by nurses	3,126		0.730		0.845
Information by doctors	3,126		0.783		0.805
Transfer of information	3,126		0.785		0.806
Rapidity research results	3,126		0.634		0.889
Autonomy	**1,661**	**73.3%**		**COPS**	
Self-sufficient	1,661		0.770		0.664
Participation in treatment decisions	1,661		0.790		0.651
Privacy	1,661		0.640		0.802
Discharge	**1,248**	**78.4%**		**COPS**	
Information about further treatment	1,248		0.810		0.704
Transfer of information to external professionals	1,248		0.770		0.751
Discharge procedure	1,248		0.772		0.748

Table 3 shows that good Cronbach's α's were found for the eight dimensions (range 0.816 to 0.906). The item internal consistency is supported by levels higher than the threshold of 0.40 (range 0.589 to 0.825). Also, all inter-item correlations were higher than 0.45 but not too high (<0.9) (range 0.511 to 0.797). The item internal consistency being high affirmed that the number of items in the dimensions is sufficient.
This table also shows that there is one dimension for which the Cronbach's α increases if an item is deleted. This applies to the item 'Privacy': if this item is deleted from the dimension *Autonomy*, Cronbach's α will increase from 0.816 to 0.827. All the other items are necessary components of the dimensions assessed.
We also found a ceiling effect in our data: the percentage of patients giving the highest possible score is much higher (range 11.6 per cent to 30.4 per cent) than the percentage of patients who gave the worst possible score (range 0.1 per cent to 1.0 per cent). The item discriminant validity (IDV) shows that all items correlate more highly with the dimension they fit in than with the other dimensions (range 0.342 to 0.729).

Table 3 *Dimension characteristics of COPS-D: dimensions, mean, SD, Cronbach's α, α if item deleted, item-internal consistency (ICC), item-discriminant validity (IDV), floor effect (floor), ceiling effect (ceiling)*

Dimensions	Mean ±SD	Cronbach's α	α if item deleted		ICC		IDV		Floor (%)	Ceiling (%)
			Min	Max	Min	Max	Min	Max		
Pre-admission visit	4.00 0.66	0.906	0.868	0.890	0.753	0.813	0.452	0.638	0.1	14.7
Admission	4.22 0.65	0.865	0.774	0.808	0.704	0.781	0.342	0.716	0.2	26.6
Operation Room	4.16 0.68	0.885	0.791	0.876	0.729	0.825	0.432	0.556	0.1	24.7
Nursing care	4.08 0.77	0.887	-	-	0.797	0.797	0.477	0.676	0.8	27.1
Medical care	4.07 0.85	0.882	-	-	0.793	0.793	0.412	0.7	0.8	30.4
Information	3.87 0.80	0.877	0.824	0.874	0.656	0.781	0.416	0.729	0.6	14.9
Autonomy	3.83 0.75	0.816#	0.692	0.827#	0.589	0.719	0.411	0.565	0.6	11.6
Discharge	3.72 0.86	0.861	0.781	0.820	0.724	0.765	0.370	0.713	1.0	13.9

Cronbach's α increases if item privacy is deleted

The correlation of the dimensions with the other dimensions and with the overall satisfaction is given in Table 4.

Table 4 *Inter-dimensional correlations Pre-admission visit (PAV), Admission (AD), Operation Room (OR), Nursing care (NC), Medical care (MC), Information (INFO), Autonomy (AUT), Discharge (DCH) and correlation with overall satisfaction score*

Dimensions COPS-D	PAV	AD	OR	NC	MC	INFO	AUT	DCH	Overall rate
PAV	-	-	0.596**	0.650**	0.540**	0.633**	0.589**	0.628**	0.545**
AD	-	-	-	0.703**	0.477**	0.604**	-	-	0.547**
OR	0.596**	-	-	0.540**	0.620**	0.572**	0.529**	0.536**	0.527**
NC	0.650**	0.703**	0.540**	-	0.563**	0.658**	0.579**	0.615**	0.584**
MC	0.540**	0.477**	0.620**	0.563**	-	0.721**	0.618**	0.641**	0.558**
INFO	0.633**	0.604**	0.572**	0.658**	0.721**	-	0.702**	0.762**	0.623**
AUT	0.589**	-	0.529**	0.579**	0.618**	0.702**	-	0.701**	0.549**
DCH	0.628**	-	0.536**	0.615**	0.641**	0.762**	0.701**	-	0.573**

** sig 0.01

The Spearman ρ-correlation with the overall satisfaction was significant at the 0.01 level for all dimensions. Also, all correlations could be considered as strong (>0.5) (range 0.527 – 0.623). The dimension *Information* correlated most strongly with patient ratings of overall satisfaction (ρ = 0.623). The inter-dimension correlation was also significant at the 0.01 level for all dimensions. All correlations except one (0.477) could be considered as strong (range 0.529 – 0.762). The strongest inter-dimensional correlation is the one between the dimensions *Information* and *Discharge*, the weakest correlation is the one between *Admission* and *Medical care*.

External validity and known group differences

The results concerning the external validity and known group differences of the COPS-D are given in Table 5 and 6. Table 5 shows that our sample consists of less children than the LMR-data. Gender and age appeared to be comparable to the total Dutch day care population.

Table 5 *External validity comparison dataset COPS-D with LMR-dataset regarding gender and age*[4]

	LMR-dataset day care 2008 (percentage)	COPS-D dataset (percentage) (N = 3,208)
Gender	**(N = 1,185,276)**	**(N = 3,702)**
Female	57%	53%
Male	43%	43%
Age	**(N = 1,185,276)**	**(N = 3,764)**
Younger than 20 years	11%	6%
20-59 years	45%	47%
60 years or older	44%	46%

4 *Not all numbers add up to 3,802, due to missing values*

Table 6 shows significant differences regarding gender, age, education and health status. Comparison by gender showed significant differences for two dimensions, *nursing care* (male 4.12 (SD=0.74), female 4.06 (SD=0.80), p=0.022) and *medical care* (male 4.10 (SD=0.86), female 4.03 (SD=0.88), p=0.024). Older patients are more satisfied on all eight dimensions. Similarly, healthier patients were more satisfied consistently. Lower educated patients were more satisfied, except with the dimensions *Pre-admission visit* and *Autonomy*.

Table 6 *Known group differences, relating COPS-D score means (SD) according to gender, age, education and health status (N=3,802)*

	PAV	AD	OR	NC	MC	INFO	AUT	DCH
Gender								
Male	4.05 (0.66)	4.20 (0.67)	4.19 (0.64)	4.12 (0.74)	4.10 (0.86)	3.88 (0.80)	3.86 (0.75)	3.76 (0.85)
Female	3.97 (0.67)	4.24 (0.65)	4.14 (0.70)	4.06 (0.80)	4.03 (0.88)	3.86 (0.79)	3.82 (0.75)	3.69 (0.87)
F (df=1)	3.5	1.3	1.9	**5.2**	**5.1**	0.7	1.7	2.0
p value	0.061	0.250	0.166	**0.022**	**0.024**	0.386	0.225	0.158
Age								
< 20 years	3.52 (0.79)	4.02 (0.77)	3.82 (0.89)	3.80 (0.92)	4.05 (0.79)	3.80 (0.766)	3.75 (0.79)	3.67 (0.92)
20-59 years	3.91 (0.66)	4.18 (0.67)	4.09 (0.66)	4.00 (0.78)	3.92 (0.87)	3.76 (0.80)	3.79 (0.73)	3.62 (0.85)
> 60 years	4.12 (0.64)	4.30 (0.61)	4.26 (0.67)	4.22 (0.72)	4.21 (0.82)	3.99 (0.78)	3.90 (0.78)	3.85 (0.86)
F (df=2)	22.7	15.8	14.0	53.1	45.5	32.2	4.3	10.9
p value	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**0.013**	**<0.0001**
Education								
None/lower	4.07 (0.67)	4.28 (0.65)	4.22 (0.66)	4.16 (0.78)	4.18 (0.81)	3.98 (0.77)	3.88 (0.75)	3.83 (0.83)
Moderate	3.99 (0.65)	4.19 (0.65)	4.16 (0.66)	4.04 (0.75)	3.99 (0.85)	3.84 (0.78)	3.84 (0.73)	3.70 (0.86)
Higher	3.96 (0.68)	4.17 (0.67)	4.10 (0.72)	4.04 (0.80)	3.99 (0.91)	3.73 (0.85)	3.77 (0.81)	3.59 (0.89)
F (df=2)	2.6	**4.5**	**3.0**	**9.6**	**18.3**	**20.8**	2.5	**7.0**
p value	0.074	**0.012**	**0.049**	**<0.0001**	**<0.0001**	**<0.0001**	0.08	**0.001**
Health status								
Bad/moderate	3.93 (0.74)	4.11 (0.68)	4.08 (0.74)	4.00 (0.83)	3.99 (0.88)	3.74 (0.83)	3.75 (0.77)	3.57 (0.94)
Good/very good/excellent	4.04 (0.63)	4.22 (0.68)	4.19 (0.66)	4.09 (0.75)	4.08 (0.83)	3.89 (0.78)	3.87 (0.75)	3.78 (0.83)
F (df=1)	**5.4**	**6.1**	**7.0**	**9.3**	**7.1**	**19.3**	**6.9**	**13.5**
P value	**0.02**	**0.013**	**0.008**	**0.002**	**0.008**	**<0.0001**	**0.009**	**<0.0001**

Pre-admission visit (PAV), Admission (AD), Operation Room (OR), Nursing care (NC), Medical care (MC), Information (INFO), Autonomy (AUT), Discharge (DCH)

Acceptability

One of the remaining 24 items of the COPS-D had 12 per cent missing values: 'Transfer of information to external professionals'. All the other items had less than 8 per cent missing values (range 0 per cent to 7.9 per cent).

Discussion

This paper describes the development and validation of the COPS-D for the measurement of patient satisfaction with day care in hospitals. Patient satisfaction is seen as an important indicator of quality of care [11-13, 23, 26-28]. This study meets the need of Dutch hospitals for a valid and reliable questionnaire for day care patients given the rising organisation of day care in recent years.

The day care questionnaire is based on the COPS, a well validated questionnaire to measure patient satisfaction for clinical and outpatient hospital care. It is adapted to the day care situation with two additional dimensions: *Pre-admission visit* and *Operation room*. Part of the day care patients will have surgery in the operation room and/or have an intake visit with a nurse. The importance of the pre-admission visit for day care is supported by the literature: it is associated with reduced anxiety and increased satisfaction [5, 8, 29-31]. The questionnaire was tested in a large sample of patients from five general hospitals in the Netherlands.

Construct validity and reliability

Based on the correlations being higher than 0.7, we concluded that the items 'Personal attention surgeon', 'Information surgeon' and 'Transfer of information' in the COPS-D measure the same construct as items in the COPS. It is reasonable to assume that the surgeon is the only doctor that the patient sees during the day care admission. We therefore deleted these redundant items from the dimension *Operation room*.

The factor analysis confirmed the relevance of the eight dimensions of the questionnaire. The extraction communalities were higher than the threshold, as were the MSA.

Cronbach's α's showed good internal consistency within the dimensions. The item internal consistency was higher than the threshold, as were the inter-item correlations. The item discriminant showed that all items correlated stronger with the dimension they fit in than with the other dimensions. The results of the item 'Privacy' were erratic. If this item is deleted from the dimension *Autonomy*, the Cronbach's α slightly increases. One could argue that the item 'Privacy' is not that important for a one day visit to the hospital and that it therefore should be deleted from the questionnaire. However, this item has inter-item correlations higher than 0.45 (0.530 with 'Self-sufficient' and 0.557 with 'Participation in treatment'), extraction communalities are higher than 0.45 (0.640) and the item internal consistency is also higher than 0.40 (0.589). Therefore we decided to keep this item in the questionnaire. It could be interesting to investigate the scores on this item after collecting data from more hospitals with different kinds of day care facilities.

Patient's overall satisfaction showed strong correlations (Spearman's ρ >0.5) with the eight dimensions. From the literature [32] we know that overall satisfaction rates most highly correlate with factors associated with patient's interaction with the hospital staff. This study showed that the dimension with the highest correlation with overall satisfaction in day care was the dimension *Information*. These findings correspond for example with the results of patient satisfaction research on pre-assessment clinics, where the provision of information was also an important indicator of patient satisfaction [29, 33], and in day care for neurological patients, where patient satisfaction was not related to a new diagnosis or treatment, but rather to the amount of information and emotional support during the day care stay [33]. Patient information has become crucial in health care because it is necessary to enable the patient to take part in medical decisions and the resulting care provision [34].
The items in the COPS-D with the strongest correlation with overall satisfaction were 'Transfer of information between professionals' (ρ = 0.58), 'Reception at the day care department' (ρ = 0.57) and 'Information about further treatment' (ρ = 0.57). Next in strength were 'Expertise', 'Attention' and 'Information of the nurses' (ρ = 0.55) and 'Doctors' (ρ = 0.53).
Apparently, the procedural items are more important to day care patients than to clinical patients, for whom interaction and attention of the professionals were most strongly related with their overall satisfaction [32]. Literature supports the finding that exchange of information between health care professionals and patients is essential, also because of time constraints and limited patient contact [5]. This might be an interesting field of future research. Especially the consequences for organisation of and attitude of professionals in day care centres deserve attention.

External validity and known group differences

Although our sample involves less children (age 0-19 year) than the total Dutch day care population, the results of the two groups are comparable regarding gender and age. Therefore we assume that the results can be extrapolated to Dutch day care patients in general.
We found, as expected, that older and healthier patients are more satisfied with respect to all dimensions. We also found patients with lower education levels are

more satisfied, except for the dimensions *Pre-admission visit* and *Autonomy* and that gender does not have a significant effect on satisfaction scores on all dimensions. These findings are in line with the literature [12, 22, 23].

Acceptability

Clearly missing values are to be avoided. Our analysis showed that one of the remaining 24 items in this questionnaire had over 10 per cent missing values. There is no strict rule regarding the maximum number of missing values to be considered acceptable. The number of missing data may be affected by a number of factors: the nature of the variable, the specialty a patient visited or the patient's treatment [24, 25].
The item 'Transfer of information to external professionals' clearly is not applicable to all patients. Twelve per cent of the day care patients did not answer this item on the questionnaire. This might depend on the specialty or treatment of the patient. Twenty per cent of the dermatology patients did not answer this item, as well as up to 7 per cent of the patients coming for ear nose throat-surgery.
During our pilot study it appeared that day care organisation varied widely between Dutch hospitals. Day care centres differed in name, organisation of the department, employees and (medical) treatments or operations. For example, there are day care centres for surgery, for radiotherapy, psychiatric treatment, dialysis or diagnostics. Therefore, we suggest that this item is only added to the questionnaire if transfer to external professionals is indeed applicable. If this item is deleted, the Cronbach's α still will be good (0.82 rather than 0.86). Another possibility for future research is to add the answering category 'Not applicable', because this might be the reason a relatively high percentage of patients did not answer the question.

As patient satisfaction is seen as indicator of quality of care and satisfaction may depend on the type of hospitalisation, it is reasonable to assume there is a difference in satisfaction between different kinds of hospital care [32, 35]. Day care patients receive a different kind of care than clinical patients. The logistics and atmosphere of day care departments are different in the inpatient clinic. In general, day care patients are in better health than clinical patients. Moreover, health status influences patient satisfaction [23, 32, 36], as do individual conditions, treatments and preferences [37]. It can be expected that day care patients are more satisfied with day care facilities than clinical patients with inpatient care [30, 38, 39]. This corresponds with findings about patient satisfaction about day care admission for neurological second opinions or tertiary referrals [33]. Because the Clinical COPS, Outpatient COPS and COPS-D contain several identical questions, a comparable study can identify possible differences between the three types of care. This is an interesting topic of future research.

Limitations

A number of limitations of the study design must be mentioned.
First, we could not study the characteristics of the non-responders, because of anonymity. Although our response rate is reasonable [14, 40], extremely (dis)satisfied patients may not have returned the questionnaire. However, former research showed that the impact of non-response bias on satisfaction questionnaires of hospitalized patients is relatively small [34, 41]. Also the external validity results showed that although our sample involves somewhat less children than the population of day care patients in the Netherlands, the groups are comparable regarding gender and age. Therefore, we assume that our non-response bias is limited.
Secondly, although the COPS is entirely based on the needs of clinical patients [13], day care patients were not specifically involved in constructing the COPS-D. The adaption is based on suggestions of professionals in hospitals that provide day care. We have assumed that the six general dimensions of *Admission, Nursing care, Medical care, Information, Autonomy* and *Discharge and aftercare* were also important to day care patients. We indeed found high correlations between these dimensions and the day care patient's overall satisfaction. Still, there might be other aspects of day care which are important but not yet covered in the COPS-D. In-depth interviews and focus groups could further establish the content validity of this questionnaire for day care patients.
One of the arguments against assessing patient satisfaction is the skewed score distribution found regularly [34, 42]: most patients are satisfied with the care they receive and only very few are dissatisfied. We indeed found a ceiling effect in our data: the highest percentage of the maximum score given addresses medical care (given by 30.4 per cent of the patients). Nevertheless, high satisfaction figures do not mean that there is no room for improvement [36]. In this study we also see differences in means between the dimensions: e.g., comparing the mean score for *Admission* (M=4.22) and the mean score for *Discharge* (M=3.72). Thus, there is still room for improvement.

Conclusions

The COPS-D is a valid and reliable questionnaire for assessing day care satisfaction. It completes the model of measuring patient satisfaction of the common types of care given in hospitals. The added value when compared to the COPS consists of two

new dimensions: *Operation room* and *Pre-admission visit*. The COPS-D fulfils the conditions made in advance while developing the Clinical and Outpatient COPS: a short, core instrument to screen patient satisfaction. This important information about hospital performance can be used to plan quality improvements. Over the next years, it becomes important to investigate whether hospitals indeed base their quality improvement activities on these patient satisfaction measurements and to what extent patient satisfaction improves after implementing such quality improvement activities.

Author's contributions

Concept and design (SK, TK, LZ, JH), collection of the data and literature (SK), statistical analysis and interpretation of the data (SK, LZ), drafting of the manuscript (SK, TK, LZ, JH), critical revision of the manuscript (TK, LZ, JH), supervision (JH). All authors read and approved the final manuscript.

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Part 2

A comparison of patient satisfaction scores between hospitals and over time

Patient satisfaction revisited: a multilevel approach

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Published as: K.D. Hekkert et al. Social Sciences and Medicine 69 (2009) 68-75 DOI: 10.1016/j.socscimed.2009.04.016

Abstract

Background
Patient satisfaction surveys are increasingly used for benchmarking purposes. In the Netherlands, the results of these surveys are reported at the univariate level without taking case mix factors into account.

Objectives
The first objective of the present study is to determine whether differences in patient satisfaction are attributed to the hospital, department or patient characteristics. Our second aim is to investigate which case mix variables could be taken into account when satisfaction surveys are carried out for benchmarking purposes.

Methods
Patients who either were discharged from eight academic and fourteen general Dutch hospitals or visited the outpatient departments of the same hospitals in 2005 participated in cross-sectional satisfaction surveys. Satisfaction was measured on six dimensions of care and one general dimension. We used multilevel analysis to estimate the proportion of variance in satisfaction scores determined by the hospital and department level by calculating intra-class correlation coefficients (ICC). Hospital size, hospital type, population density and response rate are four case mix variables we investigated at the hospital level. We also measured the effects of patient characteristics (gender, age, education, health status, and mother language) on satisfaction.

Results
We found ICCs on hospital and department level ranging from 0 to 4 per cent for all dimensions. This means that only a minor part of the variance in patient satisfaction scores is attributed to the hospital and department level. Although all patient characteristics had some statistically significant influence on patient satisfaction, age, health status and education appeared to be the most important determinants of patient satisfaction and could be considered for case mix correction. Gender, mother language, hospital type, hospital size, population density and response rate seemed to be less important determinants. The explained variance of the patient and hospital characteristics ranged from 3 to 5 per cent for the different dimensions.

Conclusions
Our conclusions are, first, that a substantial part of the variance is on the patient level, while only a minor part of the variance is at the hospital and department level. Second, patient satisfaction outcomes in the Netherlands can be corrected by the case mix variables age, health status and education.

Introduction

Patient satisfaction is considered to be a major indicator in the evaluation and improvement of quality in health care [1-4]. It is a widely used instrument by health care organisations all over the world in order to capture the patient's personal evaluation of care. Satisfied patients are important for hospitals because they are more likely to continue using health services, comply with medical treatment, maintain the relationship with a specific health care provider [5, 6] and recommend the health service to others [7].
In the Netherlands, a patient satisfaction survey was developed and validated in 2002 directed by the eight academic hospitals [8]. There were two main reasons for hospitals to develop this so-called Core Questionnaire for Patient Satisfaction (COPS). First, it had to feed information back to the management and medical staff as part of quality improvement efforts. By benchmarking their results hospitals hoped to gather valuable information about how well they perform compared with others. They also expected to identify best practices and adapt the solutions in order to solve similar problems encountered in their own institutions [9, 10].
Second, hospitals wanted to enlarge transparency about their performances. In order to make their own choices patients needed to be informed about differences in satisfaction between hospitals.
The last five years, almost all Dutch hospitals have used the COPS as an instrument for benchmarking of and creating transparency about patient satisfaction. The NVZ Dutch Hospital Association together with the Dutch Health Care Inspectorate accepted the COPS as a basic indicator that hospitals have to publish yearly on the internet. In the meantime, managed competition was introduced in the Dutch health care arena. The government emphasized consumer choice and competition among care insurers and providers. This implies that insurers have to negotiate with health care providers including hospitals about price and quality of purchased care [11]. In such a competitive environment, patient satisfaction could become a key to gaining and maintaining market share. Information about patient satisfaction could be used by insurers and patients in order to select care providers. Furthermore, as the results of patient satisfaction surveys are made public on the internet, patients could use this information to make a more informed choice of health care provider. These developments call for refinement of existing quality indicators including patient satisfaction measurements.

Points of critics and support

Although patient satisfaction surveys are widely used instruments, previous research addressed some disadvantages of patient satisfaction surveys. First, some studies consider the lack of consensus regarding the concept of patient satisfaction as one of the weaknesses of satisfaction surveys [5, 12-16]. Indeed, patient satisfaction can have several indicators such as perceived expertise of the physicians, perceived expertise of the nurses or organisational communication culture [8, 17]. So one must be aware of the type of satisfaction he or she is assessing in any particular satisfaction survey.
Second, satisfaction surveys are presumed to have low discriminative abilities [14, 17, 18] implying that the surveys are not able to demonstrate differences between hospitals and departments within hospitals. There is, however, no empirical evidence for this claim.
Third, patient satisfaction surveys have been criticized for their subjectivity [18, 19]. Indeed, patient satisfaction studies are based on subjective judgements of clients. This subjectivity can also be considered as a unique strength of satisfaction measurements because of its ability to assess patient's psychological evaluation of quality of health care [5, 20]. As a result of the mentioned critics, the concept of patient experiences has been proposed [21, 22].
Despite the criticism, considerable research has shown that perceived satisfaction influences to an important extent the quality of care. More specifically, results of patient satisfaction studies help health care providers to identify potential areas for improvement which in turn can increase the effectiveness of health care systems [1, 7]. A recent study found that providing better health care and especially maintaining constant patient-physician communication improves patient satisfaction [23]. The fact that patient satisfaction surveys usually consist of a limited number of items, make them suitable as a quick screening instrument for assessing how patients perceive the care they receive.

Determinants of patient satisfaction

Prior research has made several attempts to define the determinants of patient satisfaction. For this purpose, socio-demographic characteristics of patients are most often studied as predictors of satisfaction. The majority of these studies show

either weak, inconsistent or no relations at all. Age for instance seems to be the most consistent predictor, with older patients being more satisfied [5, 6, 18, 24-27]. However, the effects of gender are less consistent: while many studies showed that female patients are more satisfied [5, 24], other studies showed men to be more satisfied [18, 27], or revealed no differences [18, 25]. Low education [18, 25, 27] and a good state of health [6, 25, 26] tend to lead to more satisfaction. Also these effects appear to be inconsistent across different studies [5, 24]. Furthermore, some studies show a role for ethnicity in determining patient satisfaction [18, 25], but also here no consistence is reached yet.

Aim of this study

An important deficiency of above reviewed studies is the fact that none of them have applied multilevel techniques. This is a serious drawback because there could be variation at the hospital and department levels that is not captured in the reviewed studies. None of these studies investigated the extent to which hospital and department characteristics affect patient satisfaction. Some of the relevant factors for the hospital characteristics have been investigated with regular data analysis. This research points out a relation between organisational, service, financial and provider characteristics of care and patient satisfaction [1, 5, 28, 29]. For example, studies examining the effect of hospital size and teaching status on patient satisfaction with hospital care indicate that larger hospitals [30-32] and teaching hospitals [31, 32] are associated with lower levels of satisfaction. Furthermore, rural hospitals receive higher satisfaction scores compared to urban hospitals [32]. Though, in two other areas that are related to patient satisfaction, multilevel analyses have been executed: patient experiences [31, 33, 34] and patient satisfaction with the general practitioner [35]. While these studies found that some variance was on a higher level, the major part of variance was on the patient level.
We aim to extend previous work on patient satisfaction in two ways. First, we aim to approach patient satisfaction with multilevel techniques. A multilevel approach is necessary because satisfaction can be influenced in different ways at hospital level versus department level or just at the patient level. Investigating the variance in patient satisfaction at three levels is important for two reasons. First, information about the relative importance of each level can be essential for planning effective quality improvements. When it is known on which level satisfaction is determined, this can result in more specific policy improvements by focusing on this particular level. Second, the amount of variance on each level is important for the case mix adjusters that have to be used in satisfaction surveys.
Our second aim is to investigate which case mix adjusters for patient satisfaction could be used. Despite the fact that many researchers investigated factors that potentially affect patient satisfaction, hardly any research concludes about factors that could be taken into account as case mix adjusters for benchmark purposes. Following from this, our research questions that will be answered in the current study are: 1) to what extent does each level contribute to the satisfaction, and 2) what are the case mix variables that could be taken into account when satisfaction surveys are carried out in practice?

Methods

Study population

In 2005 all eight academic hospitals and fourteen out of 88 general hospitals participated. The academic hospitals participated with all inpatient and outpatient departments; the general hospitals with a various number of departments. In every hospital a coordinator was appointed and instructed to ensure the uniformity in data collection across different hospitals. For all departments 200 patients were selected randomly. They were included consecutively from the start of the inclusion period, initially up to one month after discharge or an outpatient visit. We sent the patients a questionnaire by regular mail accompanied by a letter from the particular hospital explaining the purpose of the survey, and a reminder after two weeks. Patients were asked to complete the questionnaire and return it within six weeks. A helpdesk by phone and email was available in case patients needed help.
In the inpatient dataset, valid response rates (without department missing) were 55.7 per cent for academic hospitals (N=16,904) and 47.7 per cent for general hospitals (N= 11,015). In the outpatient dataset, valid response rates were 51.6 per cent for academic hospitals (N=23,344) and 44.5 per cent for general hospitals (N=15,348). These response rates are similar to the response rates which we can expect on the basis of prior research in this field.

Outcome measures

We used the Core Questionnaire Patient Satisfaction (COPS) to measure patient satisfaction with received hospital care. The COPS was developed in 2002 by the Dutch Federation of University Medical Centres (NFU) and has been proven to be reliable and valid [8, 36]. Patient satisfaction was measured on six dimensions of care: admission procedure, *nursing care*, *medical care*, *information*, *patient autonomy* and *discharge and aftercare*. The aspects were measured with two, three or four items. The dimension scores were calculated as the mean item scores per

dimension. The dimensions in the COPS used for the inpatient and outpatient surveys were identical, but the items were slightly adjusted to the context of each setting. The response possibilities on each item were on a 5-point satisfaction scale ranging from 'unsatisfied' to 'very satisfied'. This format is shown to have a better construct validity, more variability and a less peaked score distribution at the item level compared to 5- and 10-point evaluation scales [37]. In addition, the COPS of general hospitals contained one item to measure overall satisfaction measured on a 10-point rating scale. These six dimensions of care and the overall satisfaction were the dependent measures. Furthermore, patients were asked to indicate their age on a scale ranging from 1 (younger than 20 years) to 5 (60 years and older), and were asked to indicate their education level on a scale ranging from 1 (no education) to 6 (university). Patients were also asked to indicate whether they considered Dutch as their mother language. Finally, patient's self-assessed health was measured by asking them to indicate their health on a scale ranging from 1 (unhealthy) to 5 (very healthy) [38]. A variable on hospital level was the type of the hospital: general versus academic. We computed three additional variables afterwards. First, the hospital size was calculated depending on the number of recognized beds each hospital has according to an official website on which all Dutch hospitals are registered (www.kiesbeter.nl). Hospitals with 0-325 beds were considered as small, 326-600 medium sized and hospitals with more than 600 beds were considered as large hospitals. Second, the population density in the area of the hospital was taken as a variable on hospital level. Population density of 0 – 1,000 inhabitants/km^2 was considered low, 1,000-2,000 medium and more than 2,000 inhabitants/km^2 was considered as high dense. Third, the response rate of the hospital was computed as a variable on hospital level, as it is possible that (un)satisfied patients are more likely to return the questionnaire.

Statistics

To evaluate which part of the variance in patient satisfaction is related to respectively the hospital (level 3), the department (level 2) or the patient (level 1), we performed multilevel analyses (MLA) by using MLwiN 2.02 software package[5]. First, we calculated intra-class correlation coefficients (ICCs) [39]. An ICC yields the percentage of variance in patient satisfaction scores which is due to differences between hospitals or between departments.
The ICCs were calculated in an empty model with a random intercept at hospital and department level (raw ICC) and adjusted for mentioned patient and hospital characteristics (adjusted ICC). Chi-square tests were performed to calculate ICCs' statistical significance [40]. We expect that satisfaction measured at the patient level will also partly depend on the hospital and partly on the department level [15, 31, 33-35]. It is likely that patients within the same hospital or within the same department agree more on satisfaction with quality. Furthermore, we expect that adjusted ICCs are lower than raw ICCs [41] indicating that the existing differences between hospitals and departments can partly be explained by differences in case mix adjusters.
Because satisfaction scores were negatively skewed, we performed a square transformation. Residual analysis in MLwiN showed that residuals were distributed more normally after transformation. Afterwards satisfaction scores were transformed into Z-scores in order to calculate standardised coefficients. This enables us to compare the impact of predictors (patient characteristics) because it makes the scale of the predictors irrelevant [42].

5 *We also performed the same analysis with SPSS and obtained nearly identical results*

Results

Descriptive statistics

In case of inpatients 46 per cent of our sample was male, 42 per cent was 60 years or older, 26 per cent had higher education, 63 per cent a good self-reported health status and 87 per cent had Dutch as mother language. Patient characteristics in case of outpatients were similar: 42 per cent was male, 40 per cent was 60 years or older, 30 per cent had higher education, 63 per cent had a good self-reported health status and 88 per cent had Dutch as mother language. Concerning hospital characteristics, the sample consisted of eight academic and fourteen general hospitals; seven small, three medium and twelve large sized hospitals; six hospitals in a low population density area, four medium and twelve high. The response rate varied from 37 per cent to 66 per cent in the inpatient sample and from 32 per cent to 58 per cent in the outpatient sample.
Patient satisfaction in the inpatient setting was relatively high for the dimensions *admission procedure* (M = 3.96; SD = 0.80), *nursing care* (M = 3.95; SD = 0.87), *medical care* (M = 3.99; SD = 0.93) and *patient autonomy* (M = 3.81; SD = 0.79). Satisfaction was moderate for the dimensions *information* (M = 3.65; SD = 0.88) and *discharge and aftercare* (M = 3.54; SD = 0.99). Overall satisfaction was also moderate (M = 7.64; SD = 1.33).
In the outpatient setting satisfaction results were similar: *admission procedure* (M = 3.89; SD = 0.75), *nursing care* (M = 3.88; SD = 0.80), *medical care* (M = 4.08; SD =

0.92), *information* (M = 3.71; SD = 0.86), *patient autonomy* (M = 3.80; SD = 0.80) and *discharge and aftercare* (M = 3.42; SD = 0.99). The same holds for overall satisfaction (M = 7.61; SD = 1.20).

Variance at the hospital level

Table 1 shows the raw and adjusted ICCs (random effect) on the hospital level for the six dimensions and overall satisfaction for the inpatient setting. Table 2 shows the random effect for the outpatient setting. All raw ICCs are statistically significant but small, ranging from 0.3 per cent for *medical care* (outpatient) to 2.7 per cent for overall satisfaction (outpatient). The ICCs were higher for the outpatient setting compared to the inpatient setting for *admission procedure*, but lower for *medical care* and *patient autonom*y. In both the inpatient and outpatient setting, the highest ICC was for overall satisfaction and the lowest ICC was for the dimension *medical care*.

In the inpatient setting adjusted ICCs for the patient characteristics (gender, age, education, health status and mother language) and hospital characteristics (hospital type, hospital size, population density and response rate) were higher than unadjusted ICCs for all dimensions, especially *information* and overall satisfaction. In the outpatient setting the adjustment of ICCs had less consistent effects: some were slightly increased, others not affected or decreased.

Variance at the department level

Table 1 shows the raw and adjusted ICCs (random effect) on the department level for the six dimensions and overall satisfaction in the inpatient setting. Table 2 shows the random effect for the outpatient setting. ICCs for all dimensions are statistically significant but small, ranging from 0.5 per cent for overall satisfaction (outpatient) to 2.7 per cent for *medical care* (inpatient). The ICCs were somewhat higher in the inpatient setting compared to the outpatient setting. The highest ICCs (>2 per cent) were found in the inpatient setting for the dimensions *medical care*, *information* and overall satisfaction. Lowest ICCs were for the dimensions *patient autonomy*, *discharge and aftercare* and overall satisfaction in the outpatient setting. Contrary to the hospital level, adjustment of ICCs for patient and hospital characteristics resulted in lower ICCs in the inpatient setting. Similarly, in the outpatient setting the adjustment of ICCs revealed less consistent effects: some are slightly increased, others not affected or decreased. A considerable part of the variance was on the patient level.

Possible case mix adjusters

In the inpatient setting the patient characteristics age, education and health status had a statistically reliable effect on patient satisfaction for all six dimensions and overall satisfaction (Table 1). Gender however did not have a statistically significant effect on the dimensions *information*, *patient autonomy* and overall satisfaction. Mother language was only statistically significant for the dimensions *nursing care* and *patient autonomy*. Also in the outpatient setting, age, education and health status had a statistically reliable effect on patient satisfaction for all six dimensions and overall satisfaction (Table 2). Gender however did not have a statistically significant effect on the dimensions *patient autonomy* and *aftercare*. Mother language was only statistically significant for the dimensions *admission procedure*, *medical care* and *patient autonomy*. The effect of health status was slightly stronger in the inpatient setting, while the effect of age is slightly stronger in the outpatient setting. There were no major differences between the dimensions regarding the effect of the patient characteristics. Health status and age had obviously the strongest effect on patient satisfaction, with healthy patients and older patients being more satisfied. Lower educated patients and men were more satisfied, but the effect was smaller compared to health status and age. For the dimensions that mother language had an effect, the Dutch were more satisfied. However, the differences between the patient subgroups were rather small in absolute numbers (mean differences of 0.5 on a 5-point scale for health status, and 0.1 or less for gender, not presented). The effect of the hospital characteristics was weaker and less consistent than the patient characteristics. There was a positive relation between response rate and satisfaction, however this effect was not robust and not significant for all dimensions. Type hospital was only statistically significant for *medical care* (outpatient setting): patients from academic hospitals were more satisfied. Hospital size was only statistically significant for *nursing care* (inpatient setting): patients from smaller hospitals were more satisfied.

The explained variance of the patient and hospital characteristics was calculated on the patient level by dividing the difference in variance on the patient level between the empty model and the model with explanatory characteristics by the variance on patient level in the empty model. The explained variance ranged from 2.7 per cent (*admission procedure*) to 4.7 per cent (*information*) in the inpatient setting and from 3.2 per cent (*patient autonomy*) to 5.2 per cent (*aftercare*) in the outpatient setting. We consider a variable as case mix adjuster when adding the variable results in an improvement of the model value (-2 log likelihood) for all dimensions. Consequently, we can conclude from our analyses that health status, age and education are possible case mix adjusters. These three variables consistently appeared to

affect each dimension of satisfaction both in inpatient and outpatient settings. Although some of other variables appeared to be significant on some dimensions, we discard them as case mix adjusters due to weak and inconsistent results.

Discussion

In the current study we investigated within a large data set whether the variance in perceived patient satisfaction is on the level of hospitals, departments or patients by using multilevel analysis. We also investigated the effect of nine case mix adjusters on different dimensions of satisfaction. We will now discuss the implications of our findings for research and practice.

Hospital, department or patient level?

Our study shows that the differences in satisfaction scores are mainly determined at the patient level and to a lower extent at the department and the hospital level. Between 0 to 4 per cent of the variance in patient satisfaction scores was on the hospital and department level; the remaining variance was found to be on the patient level. The patient and hospital characteristics (age, gender, education, health status, mother language, hospital type, hospital size, population density and response rate) explained 3 to 5 per cent of the variance. This is consistent with other findings in the literature. A comparable study on patient experiences showed that ICCs on hospital level range from 0.02 to 0.03 [33], while another study found ICCs on department level ranging from 0 per cent to 7 per cent [31]. Mostly ICCs are lower: in a study where more than 1,000 primary care variables were calculated, the median ICC is 0.01 [41]. A study in nursing homes and care by general practitioners at daytime found higher ICCs on organisational level respectively ranging from 2.7 per cent to 38.4 per cent and 2.0 per cent to 14.5 per cent [43]. The highest ICCs in this study were found on variables such as 'accessibility' and 'accommodation'. For nursing homes and general practitioner practices there are major differences between these items, far more than the differences in treatment and care in hospitals. Therefore, it is difficult to make meaningful comparisons between ICCs in different parts of the health care [41], see also [31, 33, 34].

Determining case mix variables

We studied the influence of several factors on patient satisfaction that could be used as case mix adjusters. We confirmed conclusions from prior studies that age, education and self-reported health status have a clear, consistent and significant influence on the satisfaction outcomes. On the other hand, in our study mother language and gender had a significant effect for some dimensions, but these effects were weak and inconsistent. Hospital size was only significant on two dimensions; hospital type and population density on none. Response rate was statistically significant on some dimensions, but the effect was not robust.
Further analysis on the response rate showed that hospitals with a high response rate as well as hospitals with a low response rate had somewhat higher satisfaction scores, while hospitals with a medium response rate had somewhat lower satisfaction scores. It is possible that both satisfied and unsatisfied patients are more willing to return the survey in order to express their (dis)satisfaction. However, our results cannot confirm this hypothesis, as we have only data about the responders and not about the non-responders. We expect that our research method does not influence the response, as we use a standard procedure with random selection of 200 patients for every department. This procedure prevents that doctors, nurses or other hospital employees have an influence on who is selected to participate.

Future research should explore whether other socio-demographic characteristics than the ones we examined can explain part of the remaining variance. For instance, socio-economic status (defined by postal code) and psychological status [5, 18, 25] will be added to the personal characteristics of some test surveys with the COPS in 2009 in order to analyse their significance. Nowadays, these are no part of our present data set and therefore could not be taken in the analysis.
Furthermore, other studies found that factors relating to the admission itself have an influence on patient satisfaction outcome such as admission procedure [27, 44], patient diagnosis, treatment history, patient global report of outcome and length of stay [45]. It could be argued that some of those characteristics such as length of stay should not be part of a case mix because these are the results of the quality of care and a choice of the staff of the hospital and therefore part of the quality it delivers. Investigating the influence of these factors implies also another way of research because of privacy problems. It could be done by combining the satisfaction data set with data from routinely administrative databases such as the National Medical Registration (LMR) in the Netherlands.
A part of the remaining unexplained variance on the patient level could be explained by existing expectations. Linder-Pelz [46] found that expectations appeared to be the most important social psychological predictor of satisfaction, explaining 8 per cent of the variance in patient satisfaction. Furthermore, she found that patient expectations have an independent effect on satisfaction, irrespective of their

fulfilment. This suggests that patients are likely to express satisfaction no matter what care is given. In contrast to these findings, Fitzpatrick and Hopkins [13] found little relation between expressed expectations and satisfaction. More recently, Jackson [26] found that a lack of unmet expectations was a powerful predictor of satisfaction. Because of these inconsistencies and a lack of conceptual clarity regarding the term expectations in the literature, it is difficult to draw definite conclusions concerning the impact of patient expectations [47].

In sum, we can conclude that patient characteristics explain a major part of patient satisfaction whereas there is only minor variance at the hospital and the department level. This conclusion is supported by a limited number of studies analysing satisfaction surveys with multilevel techniques [15, 35]. In addition, multilevel analysis performed on patient experiences surveys also found that the major part of variance is on the patient level [31, 33, 34]. Concerning case mix adjustment, from a statistical point of view one could conclude that age, health status and education should be considered to be used as case mix variables to correct patient satisfaction outcomes in the Netherlands. However, deciding on which variables should and should not be used as case mix adjusters is not only a statistical exercise. It also depends on the aim of the benchmark. For instance, age as case mix adjuster might favour hospitals that serve ceteris paribus a relatively older patient population. For presenting rankings between hospitals this might seem fair. However, one might also argue that correcting for age takes away incentives for the mentioned hospital to develop age specific programmes that increase satisfaction of relatively older patients. In sum, a definitive answer on case mix correctors depends not just on statistical arguments but also on the aim of the benchmark. This is beyond the scope of our article.

Hospital versus department

We found both in the inpatient and the outpatient setting slightly more variance on the department level than on the hospital level. An exception is overall satisfaction which has a higher ICC on the hospital level, especially in the outpatient setting. This indicates that departments have a higher influence on satisfaction. However, hospitals have a higher influence on overall satisfaction within outpatient setting. Therefore it seems that patients are more able to differentiate between departments than between hospitals. However, the general impression of the hospital seems to be important in determining the overall satisfaction. Our results show that in the inpatient setting the adjustment of the ICC for the case mix increased variance on hospital level and decreased variance on department level. In the outpatient setting the adjustment of ICCs has less consistent effects. Increase in ICC after adjustment is contradictory to what is found in the literature: usually adjusted ICCs are lower than raw ICCs [41]. This increase in ICCs indicates that the true difference between inpatient settings of hospitals is larger when differences in case mix are taken into account. In a similar vein, the decrease in ICCs indicates that the differences between inpatient departments are partly a result of differences in case mix. In sum, we have shown that case mix variables do influence the variance in patient satisfaction.

Limitations, implications and directions for future research

First, a possible limitation of the present study could be that (un)satisfied patients are more likely to return the questionnaire which might result in response bias. However, the impact of non-response bias on comparisons between hospitals seems to be small [48]. In this study we also showed that the effect of response rate as a hospital variable was not robust and not significant on all dimensions. Second, social psychological artefacts can bias the results. There are different types of artefacts, for example social desirability, self-interest, and cognitive dissonance. We assumed that because of anonymity of the survey the effects of social desirability and self-interest are small. Cognitive dissonance implies that patients might show satisfaction in order to justify the time and effort they put in receiving their treatment [18]. Pascoe [5] concluded in his review that social psychological artefacts play a role, but this does not lead to bias in patient satisfaction surveys. Finally, the satisfaction scores we found were generally quite high, as is found in most satisfaction studies [49]. This artefact can be a result of the survey design but it also is likely to be a valid reflection of patient views. On a national level the quality of care in the Netherlands is relatively high [50]. Compared to other industrialized countries Dutch patients express high levels of confidence in the quality and accessibility of care [50], and report higher levels of satisfaction with the health care system [51]. On the other hand, people might be unwilling to express dissatisfaction because of a desire not to appear ungrateful as well as the recognition of unavoidable limitations that are inherent to health care system. Future research can investigate the role of these two factors on the patient satisfaction.

We have shown that patient characteristics, especially age, health status and education have a substantial impact on the outcome of satisfaction research. This suggests that results of satisfaction surveys could be adjusted for case mix of the departments and the hospitals when carrying out benchmarks between or within hospitals. This is important because benchmark projects with case mix corrections

can help health care organisations to make a well-informed choice how to improve the quality of care [7]. Although researchers found that the impact of adjustment for patient characteristics on hospital rankings is small [52], adjustment might provide a more correct comparison. Until now, case mix correction in benchmarks of patient satisfaction has not been carried out in The Netherlands.

Finally, it is possible that variance in patient satisfaction is caused by factors on a lower level than the hospital and the department, but at a higher level than the patient. Therefore, future research can also take into account specific micro-units within departments such as individual doctors [34]. This can yield new insights about the sources of variance in patient satisfaction.

Acknowledgments

The authors thank the Dutch Federation of University Medical Centres (NFU), the Dutch Hospitals Association (NVZ), H.C. de Haes and C. Veldkamp for their input during the completing of the study and their comments on an earlier draft of this article. Furthermore, we thank Jos Twisk and Michiel de Boer for helpful discussion concerning multilevel analysis.

Author's contributions

Concept and design (KH, SC, SK, BB, TK), collection of the data and literature (KH, SK), statistical analysis and interpretation of the data (KH, SC), drafting of the manuscript (KH, SC, SK, BB, TK), critical revision of the manuscript (SC, BB, TK), supervision (BB, TK). All authors read and approved the final manuscript.

Table 1 *Fixed and random effects: coefficients with standard errors of the patient characteristics and ICCs and adjusted ICCs (%) for the dimensions, inpatient setting*

Table 2 *Fixed and random effects: coefficients with standard errors of the patient characteristics and ICCs and adjusted ICCs (%) for the dimensions, outpatient setting*

Table 1

	Admission procedure N = 25,614		Nursing care N = 27,006		Medical care N = 26,905		Information N = 25,510		Patient autonomy N = 25,081		Discharge and aftercare N = 20,168		Overall satisfaction N = 10,510	
Fixed effects	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE
gender[1]	-0.024*	0.007	-0.043*	0.006	-0.020*	0.006	-0.009	0.006	-0.005	0.007	-0.014†	0.007	-0.011	0.010
age[2]	0.126*	0.007	0.126*	0.007	0.163*	0.007	0.142*	0.007	0.091*	0.007	0.117*	0.008	0.119*	0.012
education[3]	-0.054*	0.006	-0.040*	0.006	-0.046*	0.006	-0.056*	0.006	-0.033*	0.007	-0.068*	0.007	-0.033*	0.010
health status[4]	0.156*	0.007	0.163*	0.007	0.163*	0.007	0.230*	0.007	0.226*	0.007	0.232*	0.008	0.236*	0.012
mother language[5]	0.000	0.006	-0.016‡	0.006	-0.009	0.006	0.005	0.006	-0.014†	0.006	0.004	0.007	0.000	0.010
type hospital[6]	-0.040	0.051	0.020	0.057	-0.038	0.056	0.019	0.065	-0.002	0.061	0.075	0.060	-	-
size hospital[7]	-0.057	0.032	-0.074†	0.035	-0.053	0.035	-0.068	0.040	-0.062	0.037	-0.050	0.037	-0.081	0.047
population density[8]	0.043	0.035	0.058	0.039	0.050	0.039	0.069	0.044	0.062	0.041	0.063	0.042	0.086	0.055
response rate	0.104‡	0.035	0.110‡	0.038	0.050	0.039	0.083	0.044	0.099†	0.041	0.101†	0.041	0.164†	0.068
Random effect	ICC[9]	adj ICC[10]	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC
hospital level	0.9*	1.6*	1.2*	2.0*	0.8*	1.9*	0.9*	2.8*	1.2*	2.5*	1.0*	2.3*	2.5*	4.0*
department level	1.8*	1.3*	1.9*	1.4*	2.7*	2.1*	2.4*	1.8*	1.2*	0.9*	1.9*	1.5*	2.1*	1.8*

† p<0.05; ‡ p<0.01; * p<0.001 (chi-square test)

1 Reference group males
2 Reference group younger than 20 years
3 Reference group no education
4 Reference group poor health
5 Reference group Dutch
6 Reference group academic hospitals
7 Reference group small hospitals
8 Reference group low density
9 ICC hospital level respectively department level is variance hospital/total variance respectively variance department/total variance. Represents the amount of variance in patient satisfaction scores that is attributed to the hospital respectively department
10 Adjusted for the patient and hospital characteristics gender, age, education, health status, mother language, type hospital, size hospital, population density and response rate

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Table 2

	Admission procedure N = 37,686		Nursing care N = 37,612		Medical care N = 37,645		Information N = 28,647		Patient autonomy N = 36,449		Aftercare N = 23,948		Overall satisfaction N = 14,566	
Fixed effects	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE	coef	SE
gender[1]	-0.025*	0.005	-0.030*	0.005	-0.020*	0.005	-0.012†	0.006	-0.008	0.005	-0.010	0.006	-0.025‡	0.008
age[2]	0.179*	0.006	0.163*	0.006	0.160*	0.006	0.161*	0.007	0.120*	0.006	0.140*	0.007	0.142*	0.009
education[3]	-0.048*	0.005	-0.046*	0.005	-0.034*	0.005	-0.039*	0.006	-0.018*	0.005	-0.073*	0.007	-0.054*	0.008
health status[4]	0.128*	0.006	0.139*	0.006	0.146*	0.006	0.193*	0.007	0.175*	0.006	0.226*	0.007	0.232*	0.010
mother language[5]	-0.010†	0.005	-0.003	0.005	-0.019*	0.005	-0.008	0.006	-0.019*	0.005	0.007	0.006	0.009	0.008
type hospital[6]	-0.032	0.049	-0.032	0.043	-0.056	0.029	-0.007	0.045	-0.063	0.041	0.022	0.049	-	-
size hospital[7]	-0.039	0.035	-0.034	0.030	-0.047†	0.022	-0.043	0.032	-0.031	0.029	-0.033	0.034	-0.064	0.047
population density[8]	-0.012	0.032	-0.009	0.028	0.037	0.021	0.031	0.030	0.022	0.027	0.008	0.032	0.013	0.043
response rate	0.054	0.030	0.053†	0.026	0.029	0.019	0.041	0.028	0.034	0.025	0.076‡	0.029	0.094†	0.047
Random effect	ICC[9]	adj ICC[10]	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC	ICC	adj ICC
hospital level	1.4	1.6*	1.2*	1.2*	0.3*	0.4*	0.8*	1.3*	0.8*	1.1*	1.3*	1.7*	2.7*	3.5*
department level	1.6*	1.6*	1.3*	1.2*	1.8*	2.2*	1.6*	1.5*	0.8*	1.0*	0.8*	0.6*	0.5*	0.9*

† p<0.05; ‡ p<0.01; * p<0.001 (chi-square test)

1 Reference group males

2 Reference group younger than 20 years

3 Reference group no education

4 Reference group poor health

5 Reference group Dutch

6 Reference group academic hospitals

7 Reference group small hospitals

8 Reference group low density

9 ICC hospital level respectively department level is variance hospital/total variance respectively variance department/total variance. Represents the amount of variance in patient satisfaction scores that is attributed to the hospital respectively department

10 Adjusted for the patient and hospital characteristics gender, age, education, health status, mother language, type hospital, size hospital, population density and response rate

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Is the length of stay in hospital correlated with patient satisfaction?

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Published as: Borghans et al. International Journal for Quality in Health Care 2012; Volume 24, number 5: pp. 443-451 DOI: 10.1093/intqhc/mzs037

Abstract

Objective
To investigate the correlation between length of stay (LOS) and patient satisfaction on the level of hospital wards. The underlying hypothesis is that good quality of care leads both to shorter LOS and to patients that are more satisfied.

Design
We used standardised LOS and standardised patient satisfaction data from seven specialisms: internal medicine, cardiology, pulmonology, neurology, general surgery, orthopaedic surgery and obstetrics & gynaecology in the period 2003-2010. All LOS data were derived from the National Medical Registration and patient satisfaction scores were measured by a questionnaire covering six aspects of care. The LOS data were standardised for the year of discharge, age, primary diagnosis and procedure. Patient satisfaction data were standardised for the year, age, education and health status.

Setting
One hundred and eighty-eight Dutch hospital wards.

Participants
The patient satisfaction data were gathered by questionnaires returned by 102,815 patients.

Main Outcome Measure
Pearson correlations and 2-tailed significance between standardised mean LOS and standardised mean patient satisfaction score.

Results
We found no correlation between LOS and patient satisfaction in six out of seven specialisms. We only found significantly higher patient satisfaction scores in pulmonology for some specific items on hospitals wards with a shorter LOS. These items concerned the reception on the ward, the information provided by nurses on admission, the expertise of the nursing staff, the way information was transferred from one person to another and respect for patient's privacy such as in conversations, and during physical examinations.

Conclusions

We found no evidence that hospital wards with a relatively short mean LOS had higher, or lower, patient satisfaction than hospital wards with a relatively long LOS, with the exception of pulmonology.

Introduction

In the Netherlands, as in many other countries, hospitals have been reducing lengths of stay (LOS) for many years. This reduction reflects the introduction of new medical technologies as well as pressures for cost containment [1-3]. In the Netherlands the average LOS dropped by 5.6 days between 1990 and 2009 [4].

An abundance of literature shows large variations across hospitals in the specific LOS for procedures and diagnoses. After years of reducing average LOS, the case mix adjusted variation in LOS is still substantial [1]. It seems that this remaining variation reflects the underlying processes in hospitals that cause these differences. Hospitals seem to vary in a variety of factors. For example in waiting times, in effective cooperation and communication between care professionals and in the availability and use, both of clinical pathways and standards [5, 6]. Moreover, the number and severity of adverse events could lead to variations in LOS between hospitals. Treating patients with unqualified staff, who may not adhere to guidelines, will result in more adverse events, which may lead to a significantly longer LOS [7-19]. So making the best use of the logistics of the care process such as examinations, treatment and communication will reduce waiting times, and as a consequence, the LOS [5, 20]. But, in addition, the prevention of adverse events will also lead to a shorter LOS. As a consequence, we expect a correlation between LOS and quality indicators.

Patient satisfaction is seen as an important indicator that embraces various aspects of the quality of care [21-31]. It is our hypothesis that differences across hospitals in the underlying processes as mentioned above can be identified by measuring differences in patient satisfaction. Good quality of care might lead both to a shorter LOS and to patients that are more satisfied [32, 33]. Thus, we expect a negative correlation between LOS and patient satisfaction (see Figure 1.)

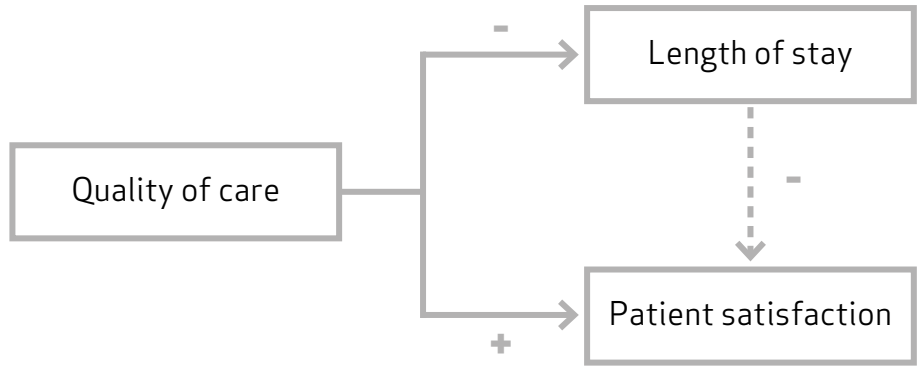

Figure 1 *Model of the correlation between quality of care, length of stay and patient satisfaction*

Figure legend:

+ positive correlation

- negative correlation

There is hardly any research on how patients in general appreciate the actual length of a hospital stay. Some studies have focused on the relationship between LOS and patient satisfaction for a specific diagnosis or treatment. These studies show that a reduced LOS does not adversely affect patient satisfaction [32, 34-37]. Carmel [38] found a significant correlation between patients with a long LOS and their satisfaction with surgical ward nurses. Rosenheck et al also found a positive relationship between LOS and patient satisfaction among psychiatric patients [39]. Other studies showed no clear relationship between LOS and patient satisfaction [24, 40, 41].

There is a lack of research on the hospital ward level within health systems which share the same organizational context. Questions remain such as: 'Do hospital wards with a relatively short LOS have a higher patient satisfaction?' Therefore, the purpose of this paper is to investigate whether we can find evidence for this correlation in an extensive dataset gathered in Dutch hospitals.

Methods

Data

All LOS data were derived from the National Medical Registration (Landelijke Medische Registratie, LMR) which contains data on admissions in general and university hospitals in the Netherlands. This information includes medical data such as diagnoses and surgical procedures as well as data specific to patients, including age and hospital stay. The LMR diagnoses are classified by the ICD-9 CM and procedures by the Dutch Classification System of Procedures. We used the LOS data of 188 hospital wards for which both patient satisfaction data and LOS data were available. We used data from seven specialism where a reduction in the LOS may have the largest impact on the national number of hospital days [1]. These specialisms are: internal medicine, cardiology, pulmonology, neurology, general surgery, orthopaedic surgery and obstetrics and gynaecology.
We used patient satisfaction data from 188 hospital wards gathered by an independent research organization, Kiwa Prismant, in the period 2003-2010 using the 'Core Questionnaire for the assessment of Patient Satisfaction' (COPS) [42, 43]. The COPS is a short core questionnaire to measure patient satisfaction, based on the needs of clinical patients in university hospitals. The questionnaire was developed to compare satisfaction scores between hospitals, and to identify opportunities for improvements in the quality of care. The clinical COPS consists of six dimensions, each dimension is constructed by two, three of four questions: *admission procedure* (three items), *nursing care* (two items), *medical care* (two items), *information* (four items), *autonomy* (two items) and *discharge and aftercare* (three items). Factor analysis showed a good reliability of these dimensions (Cronbach's alpha ranging between 0.80 and 0.88).
Originally, COPS was developed in university hospitals [44]. Since 2004, general hospitals too use the COPS as an instrument for measuring patient satisfaction. Most hospital wards participated several times with the COPS, but for this study each hospital ward is only taken into account once. We used the data from the clinical wards, day care data were excluded. See Appendix for the exact content of the COPS.

Data preparation

The LOS and satisfaction scores were based on the actual and the expected observations for a ward. The LOS scores have been expressed in the quotients of the mean observed and mean expected LOS for all patients admitted onto the clinical ward in the same year as the year when the patient satisfaction was measured. A ratio >1 indicates that the mean observed LOS was higher than the mean expected LOS. Day care and clinical patients that could have been treated in day care were excluded. The mean expected LOS of the ward was based on expectations for every individual patient, taking into account the following characteristics:

- Year of discharge
- Age (divided into five classes: 0, 1-14, 15-44, 45-64, 65+ years)
- The primary diagnosis that resulted in the admission including about 1,000 diagnoses classified by the ICD-9 in three digits
- Procedures, classified by the Dutch Classification System of Procedures. The procedures considered depend on the diagnosis of the patient

The expected LOS of an individual patient concerned the Dutch national mean LOS that was associated with these characteristics [45]. An exception was made for patients with an extreme LOS (100 hospital days or longer), and for patients who died in the hospital. For the latter two groups the expected LOS was kept equal to the actual LOS and consequently the ratio of actual LOS to the expected LOS was always 1.

The satisfaction questionnaire contained 16 questions about six aspects of care. The answer categories for each question were on an asymmetrical 5-point Likert-type scale ranging from 'unsatisfied', 'somewhat satisfied', 'rather satisfied', 'quite satisfied' to 'very satisfied'. To calculate the expected score we used all patient satisfaction data gathered by Kiwa Prismant from Dutch general and university hospital wards since 2003. This resulted in a database with 102,815 patients included in one of the seven specialisms mentioned above. Each patient has an actual score on the sixteen questions of the questionnaire. The expected score per patient was based on the national mean patient satisfaction score and the characteristics that influence patient satisfaction scores [42]:

- Year: we used two-year periods, because the number of participating hospital wards would otherwise be too small for some specialisms: 2003-2004, 2005-2006, 2007-2008 and 2009-2010
- Age: we divided patients into five age groups: younger than 20, 20-39, 40-54, 55-59 and 60 years and older
- Education: we divided patients into five categories: none, lower, middle, higher and university
- Health status: we divided patients into five categories: bad, moderate, good, very good and excellent

As a national mean patient satisfaction score per specialism we used all scores of all patients of all hospitals per 2-year period. In order to standardize the patient satisfaction scores, we used the ratio of the observed patient satisfaction score and the expected score. A ratio >1 indicated a higher patient satisfaction score than expected. A ratio <1 indicates a lower patient satisfaction score than might be expected, based on the national mean. We calculated the mean standardized patient satisfaction score (per specialism) per hospital ward by adding all scores of all patients of this ward together, divided by the number of patients. Eventually, this resulted per specialism in a standardized mean patient satisfaction score per ward on each of the 16 questions of the questionnaire.

Analysis

For all 188 hospital wards in this study, we calculated the Pearson correlations and the two-tailed significance between standardized mean LOS and standardized mean patient satisfaction score. Every hospital ward was counted only once and priority was given to the most recent data and the highest response rates.

Results

The LOS data had an overall standard deviation of the quotients of mean observed and mean expected LOS of 0.14. The standard deviation was largest in cardiology (0.16) and smallest in general surgery (0.11), see Table 1.

Table 1 *Minimum, median, maximum and standard deviations of the quotients of mean observed and mean expected LOS*[6]

	Internal Medicine	Cardiology	Pulmonology	Neurology	General surgery	Orthopaedic surgery	Gynaecology Obstetrics &	TOTAL
min	0.74	0.58	0.82	0.74	0.79	0.80	0.76	0.58
median	1.05	0.86	0.93	1.01	0.99	0.97	1.00	0.99
max	1.29	1.24	1.22	1.26	1.28	1.37	1.26	1.37
stdev	0.12	0.16	0.12	0.12	0.11	0.15	0.12	0.14

6 *The quotients are calculated by dividing the mean observed LOS by the mean expected LOS. Ay care and clinical patients that could have been treated in day care were excluded. The mean expected LOS of the ward was based on expectations for every individual patient, taking into account the following characteristics of the patients: year of discharge, age, primary diagnosis that resulted in the admission and procedure. The procedures considered depend on the diagnosis of the patient. The expected LOS of an individual patient concerned the Dutch national mean LOS that was associated with these characteristics. An exception was made for patients with and extreme LOS (100 hospital days or longer), and for patients who died in hospital. For the latter two groups the expected LOS was kept equal to the actual LOS.*

On the 16 items of the COPS the patient satisfaction data had a mean standard deviation ranging from 0.03 to 0.05. The standard deviation was largest in the item: 'transfer of information to external professionals' in neurology (0.06) and smallest in the item 'information provided by nurse on admission' in general surgery (0.02), see Table 2.

Table 3 shows the Pearson correlation and the two-tailed significance between the standardized mean LOS and the standardized mean patient satisfaction score, on each question of the COPS and for each of the seven medical wards (pulmonology, obstetrics and gynaecology, cardiology, general surgery, internal medicine, neurology and orthopaedic surgery).

Table 2 *Median, minimum, maximum and standard deviations of the quotients of mean observed and mean expected patient satisfaction scores*[7]

7 *The quotients are calculated by dividing the observed patient satisfaction score by the expected patient satisfaction score. The expected score is based on the national mean score and on the patient characteristics age, education and health status. The mean standardized patient satisfaction score per specialism and per hospital ward was calculated by adding all scores of all patients in this ward together, divided by the number of patients. This resulted in a mean standardized score per specialism per ward on all items of the questionnaire.*

Table 2

	Admission		Nursing care		Medical care		Information	
	Reception	Information provided	Personal attention	Expertise	Personal attention	Expertise	Clarity by nurses	Clarity by doctors
Pulmonology (N=23)								
median	0.994	0.991	0.998	0.994	0.995	0.999	0.998	1.000
minimum	0.912	0.908	0.937	0.927	0.897	0.892	0.896	0.896
maximum	1.063	1.062	1.072	1.071	1.060	1.072	1.087	1.049
SD	0.029	0.030	0.036	0.033	0.038	0.040	0.036	0.034
Obstetrics & gynaecology (N=27)								
median	1.000	0.991	0.989	0.987	1.013	1.002	0.995	1.000
minimum	0.934	0.917	0.920	0.928	0.882	0.925	0.930	0.866
maximum	1.074	1.068	1.075	1.059	1.073	1.049	1.048	1.064
SD	0.035	0.032	0.041	0.033	0.046	0.033	0.036	0.043
Cardiology (N=25)								
median	1.003	0.996	1.001	1.001	1.002	0.999	1.004	1.000
minimum	0.951	0.934	0.923	0.931	0.879	0.907	0.883	0.847
maximum	1.064	1.059	1.060	1.062	1.053	1.051	1.065	1.050
SD	0.026	0.031	0.028	0.031	0.034	0.030	0.036	0.037
General surgery (N=30)								
median	1.000	1.003	0.991	0.987	1.001	0.994	0.987	0.997
minimum	0.924	0.951	0.912	0.936	0.885	0.913	0.932	0.897
maximum	1.048	1.041	1.081	1.095	1.062	1.060	1.068	1.068
SD	0.031	0.023	0.033	0.032	0.044	0.036	0.035	0.044
Internal medicine (N=28)								
median	0.993	0.993	0.988	0.979	0.985	0.990	0.987	0.980
minimum	0.915	0.901	0.876	0.901	0.890	0.897	0.861	0.902
maximum	1.078	1.075	1.055	1.062	1.057	1.056	1.071	1.068
SD	0.035	0.0380	0.042	0.034	0.043	0.041	0.048	0.044
Neurology (N=27)								
median	1.001	1.002	0.996	0.998	1.003	1.006	1.005	0.994
minimum	0.907	0.933	0.872	0.905	0.864	0.898	0.859	0.809
maximum	1.051	1.061	1.077	1.063	1.062	1.061	1.058	1.094
SD	0.038	0.034	0.042	0.035	0.048	0.041	0.048	0.053
Orthopaedic surgery (N=28)								
median	0.992	0.997	0.997	0.999	1.002	0.999	1.003	0.997
minimum	0.938	0.941	0.918	0.937	0.893	0.936	0.933	0.911
maximum	1.049	1.040	1.066	1.050	1.076	1.074	1.053	1.076
SD	0.027	0.025	0.033	0.029	0.047	0.035	0.032	0.043
Mean SD per item	**0.032**	**0.030**	**0.036**	**0.032**	**0.043**	**0.036**	**0.039**	**0.043**

smallest standard deviation per item largest standard deviation per item

Table 2

	Information		Patient autonomy			Aftercare		
	Transferred	Rapidity	Self-sufficient	Participation in decisions	Privacy	Information further treatment	Information passed on	Procedure discharge
Pulmonology (N=23)								
median	0.990	1.005	0.997	0.997	0.999	1.000	1.002	1.002
minimum	0.904	0.905	0.940	0.927	0.933	0.916	0.881	0.855
maximum	1.060	1.084	1.040	1.043	1.071	1.093	1.071	1.046
SD	0.032	0.047	0.028	0.031	0.034	0.038	0.051	0.045
Obstetrics & gynaecology (N=27)								
median	0.994	1.001	0.992	1.002	0.996	1.009	0.993	0.989
minimum	0.876	0.872	0.939	0.907	0.924	0.897	0.899	0.900
maximum	1.080	1.069	1.041	1.058	1.054	1.067	1.070	1.080
SD	0.047	0.049	0.027	0.040	0.038	0.045	0.044	0.044
Cardiology (N=25)								
median	1.003	1.013	1.004	0.994	1.003	1.005	0.992	0.999
minimum	0.877	0.848	0.912	0.867	0.922	0.809	0.879	0.811
maximum	1.050	1.049	1.056	1.049	1.041	1.072	1.085	1.065
SD	0.037	0.041	0.027	0.035	0.027	0.047	0.042	0.046
General surgery (N=30)								
median	0.988	0.997	0.997	1.005	0.997	0.986	0.999	0.990
minimum	0.911	0.927	0.924	0.905	0.924	0.903	0.912	0.900
maximum	1.065	1.084	1.038	1.051	1.041	1.080	1.069	1.096
SD	0.041	0.038	0.028	0.034	0.035	0.046	0.046	0.048
Internal medicine (N=28)								
median	0.982	0.990	0.985	0.992	0.977	0.984	0.995	1.000
minimum	0.867	0.888	0.917	0.837	0.922	0.834	0.853	1.072
maximum	1.086	1.084	1.075	1.089	1.057	1.084	1.092	0.824
SD	0.051	0.051	0.038	0.060	0.034	0.057	0.058	0.051
Neurology (N=27)								
median	0.996	1.011	0.994	0.999	1.010	1.005	1.003	1.009
minimum	0.885	0.832	0.939	0.887	0.909	0.868	0.854	0.876
maximum	1.091	1.120	1.070	1.088	1.071	1.137	1.118	1.103
SD	0.050	0.060	0.031	0.044	0.041	0.053	0.062	0.050
Orthopaedic surgery (N=28)								
median	0.993	0.995	1.006	0.992	1.000	1.005	1.007	1.005
minimum	0.911	0.897	0.913	0.934	0.930	0.919	0.866	0.902
maximum	1.082	1.074	1.062	1.059	1.053	1.057	1.073	1.073
SD	0.042	0.039	0.032	0.034	0.029	0.035	0.045	0.043
Mean SD per item	**0.043**	**0.046**	**0.030**	**0.040**	**0.034**	**0.046**	**0.050**	**0.047**

SD = Standard deviation

Table 3 *Correlations between standardised mean length of stay and standardised mean patient satisfaction score for the 16 questions of the core questionnaire*

	Admission		Nursing care		Medical care		Information	
	Reception	Information provided	Personal attention	Expertise	Personal attention	Expertise	Clarity by nurses	Clarity by doctors
Pulmonology (N=23)								
Pearson Correlation[a]	-0.55	-0.61	-0.50	-0.54	-0.43	-0.47	-0.52	-0.49
Significance (two-tailed)	0.0060	0.0021	0.0160	0.0084	0.0383	0.0250	0.0104	0.0163
Obstetrics & gynaecology (N=27)								
Pearson Correlation[a]	-0.02	0.17	0.06	0.12	0.27	0.16	0.25	0.39
Significance (two-tailed)	0.9297	0.3905	0.7726	0.5347	0.1787	0.4157	0.1997	0.0418
Cardiology (N=25)								
Pearson Correlation[a]	0.11	-0.16	0.10	0.07	-0.07	-0.18	0.02	-0.09
Significance (two-tailed)	0.6131	0.4544	0.6380	0.7388	0.7274	0.3783	0.9261	0.6758
General surgery (N=30)								
Pearson Correlation[a]	-0.25	0.03	-0.25	-0.22	0.29	0.19	-0.13	0.20
Significance (two-tailed)	0.1847	0.8584	0.1876	0.2385	0.1141	0.3129	0.4772	0.2896
Internal medicine (N=28)								
Pearson Correlation[a]	-0.17	-0.14	-0.21	-0.11	0.02	-0.02	-0.10	-0.05
Significance (two-tailed)	0.3820	0.4656	0.2755	0.5933	0.9050	0.9232	0.6015	0.7899
Neurology (N=27)								
Pearson Correlation[a]	0.19	0.00	0.28	0.22	-0.07	-0.01	-0.10	-0.13
Significance (two-tailed)	0.3385	0.9912	0.1556	0.2694	0.7317	0.9507	0.6256	0.5041
Orthopaedic surgery (N=28)								
Pearson Correlation[a]	0.06	-0.03	-0.09	-0.17	0.08	0.01	-0.23	-0.05
Significance (two-tailed)	0.7508	0.8924	0.6367	0.3829	0.6884	0.9713	0.2338	0.8078

a The Pearson correlations were calculated between standardized mean LOS and standardized mean patient satisfaction score

correlation is significant at the 0.05 level (2-tailed)

correlation is significant at the 0.01 level (2-tailed)

Table 3

	Information		Patient autonomy			Aftercare		
	Transferred	Rapidity	Self-sufficient	Participation in decisions	Privacy respected	Information further treatment	Information passed on	Procedure discharge
Pulmonology (N=23)								
Pearson r[a]	-0.58	-0.39	-0.37	-0.36	-0.61	-0.30	-0.46	-0.50
Sig. (2-tailed)	0.0039	0.0649	0.0853	0.0897	0.0021	0.1640	0.0270	0.0143
Obstetrics & gynaecology (N=27)								
Pearson r[a]	0.32	0.28	0.08	0.10	0.10	0.20	0.23	0.12
Sig. (2-tailed)	0.1068	0.1589	0.6756	0.6059	0.6312	0.3200	0.2509	0.5632
Cardiology (N=25)								
Pearson r[a]	0.02	0.14	0.20	0.01	0.02	0.29	0.43	0.33
Sig. (2-tailed)	0.9108	0.5159	0.3327	0.9718	0.9208	0.1587	0.0306	0.1082
General surgery (N=30)								
Pearson r[a]	-0.14	-0.06	-0.05	0.19	0.19	0.01	-0.14	-0.02
Sig. (2-tailed)	0.4550	0.7616	0.7787	0.3152	0.3264	0.9408	0.4755	0.9221
Internal medicine (N=28)								
Pearson r[a]	-0.07	0.05	-0.04	-0.07	-0.12	-0.03	-0.08	-0.13
Sig. (2-tailed)	0.7231	0.8107	0.8595	0.7408	0.5522	0.8681	0.6911	0.5036
Neurology (N=27)								
Pearson r[a]	0.08	0.03	0.22	0.01	-0.05	0.12	0.17	0.11
Sig. (2-tailed)	0.6967	0.8754	0.2686	0.9596	0.7931	0.5353	0.3945	0.5734
Orthopaedic surgery (N=28)								
Pearson r[a]	-0.03	-0.18	0.15	-0.11	0.24	0.06	0.18	0.09
Sig. (2-tailed)	0.8612	0.3478	0.4550	0.5852	0.2194	0.7798	0.3666	0.6545

a The Pearson correlations were calculated between standardized mean LOS and standardized mean patient satisfaction score

For six out of seven specialisms no significant correlations at the 0.01 significance level were found. For these specialisms, we found no evidence that patients who stayed on wards with a relatively short mean LOS were less or more satisfied than patients who stayed on wards with a longer mean LOS.
Pulmonology is an exception. We observed 5 out of 16 items of patient satisfaction with significant correlations with LOS at the 0.01 significance level. On these five questions, patients were more satisfied on the wards with shorter mean LOS. This concerned the satisfaction about the 'reception on the ward' (r^2= -0.55; p=0.006); 'the information provided by nurses on admission' (r^2=-0.61; p=0.002); 'the expertise of the nursing staff' (r^2=-0.54; p=0.008); 'the way information was transferred from one person to another' (r^2=-0.58; p=0.004) and 'the respect for patient's privacy such as in conversations with doctors during physical examinations and during visiting times' (r^2=-0.61; p=0.002).

Discussion

As stated in the introduction, in the literature, good quality of care is often associated with shorter stays and shorter stays are not often associated with an adverse effect on patient satisfaction. For six out of seven specialisms we found no correlation between LOS and patient satisfaction, which means that we found no evidence that hospital wards with a relatively short mean LOS had higher, or lower, patient satisfaction than hospital wards with a relatively long LOS. The exception was pulmonology where we found significantly higher patient satisfaction scores for some specific items on hospital wards with a shorter LOS.
The negative correlations for pulmonology are significant and should results in further research. Our findings concern the admission, the (transfer of) information, the expertise of the nursing staff and the privacy. Without pretending to be complete we found some suggestions in literature that might contain some explanations for the negative correlations between LOS and patient satisfaction at pulmonology wards.
Firstly, pulmonology diseases are characterized by the complexity of their care, indicated by a long hospital stay and the involvement of several health care professionals. Clear communication towards pulmonary patients could be difficult. This will influence their satisfaction.
Secondly, communication and information are essential for all wards. Patients who are well informed are more satisfied and are more willing to accommodate doctor's recommendations. In chronic respiratory diseases the emphasis on formation is based on treatment, symptom relief, and the prevention of the progression of the illness. Information on the prognoses of the disease is important to patients, but this need is not always fulfilled for pulmonary patients [46].
Thirdly, patients with lung cancer – who form an important part of the pulmonary group - are less satisfied with the care received from physicians than other patients with cancer. They encounter more unfulfilled psychological and social needs compared to other cancer groups [47].
Fourthly, in pulmonary patients, psychiatric comorbidity is highly prevalent. It also plays a part in the development of functional deterioration and in determining poor medical outcomes. For example, delirium with cognitive disturbance is an acute psychopathological disturbance that usually improves considerably during the hospitalization [48].

As is common in literature we used patient satisfaction in this study as an indicator of the quality of care [24, 30]. Patient satisfaction and patient experiences have been used extensively in Dutch hospitals in the last decade for comparing hospital's quality of care and for making quality improvements [43, 49-51]. We assumed that, in cases where the quality of care is better, patients know that the quality is better and as a result of this they will be more satisfied concerning the care they received. But two crucial questions need answering. Firstly, are patient really capable of distinguishing between good and inferior quality of care and, secondly, are the questions asked by the patient satisfaction questionnaire suitable to measure this?
For patients with adverse outcomes, post-discharge, we know that they negatively influence patient's overall evaluation of the quality of their care [26]. However, we hesitate to suggest they are more negative simply because of the adverse outcome or whether this is also because of the lower quality of care, even if this did not result in an adverse outcome. Concerning the second question we doubt whether the patient satisfaction questionnaire really tackles the quality of care. It tackles the patient's possibly subjective perception of the quality of care. The questions in the questionnaire include more or less subjective topics like dignity, personal treatment and information given by the professionals. 'Objective' topics about the logistics and organization of care are not included in the questionnaire. Since patient satisfaction is influenced by patient's personal relationships with health care professionals such as doctors and nurses [21], a longer LOS might also influence the satisfaction in a positive way. A longer LOS allows for the development of more meaningful personal relationships.
Because we doubt whether the patient satisfaction questionnaire tackles the quality of care sufficiently, we suggest asking patients more directly how long they stayed

in hospital and how they experienced their LOS. In future this could be done in the patient satisfaction questionnaire or in one of the Consumer Quality Indexes. This is in line with literature supporting the relationship between patient-centred care and clinical benefits such as the survival of acute myocardial infarction and lower patient mortality rates [22, 27]. Also better compliance, recovery and reduced admission and readmission rates are associated with patient-centred care [23]. Therefore, in the future, patient reports about their care should be accompanied by assessments of their clinical outcomes [22, 23, 27].

Limitations

We could not study the characteristics of the non-responders of the patient satisfaction surveys, because of their anonymity. Although the response rate was reasonable [31], it could be that only extremely satisfied, or dissatisfied patients returned the questionnaire. However, former research showed that the impact of a non-response bias on satisfaction questionnaires of hospitalized patients is relatively small [25, 28]. For LOS data there were no non-responders. Hospitals that participated in the LMR, participated with all their clinical patients.
In the Netherlands, patient satisfaction data have been gathered separately from information about LOS. Kiwa Prismant received the questionnaires anonymously and it was not possible to link the outcomes on the patient level to the LOS of the individual patient. Therefore, our analysis is carried out at the level of the ward. No conclusions can be drawn on the level of the individual patients. From this year, however, the satisfaction questionnaire has been extended to include a question about the LOS of the patient. In the future it will be possible to make a study of the relationship between the LOS and patient satisfaction on the patient level.

Conclusion

We found no evidence that hospital wards with a relatively short mean LOS had higher, or lower, patient satisfaction than hospital wards with a relatively long LOS, with the exception of pulmonology.

Author's contributions

Concept and design (IB, SK, TK, GW), collection of the data and literature (IB, SK), statistical analysis and interpretation of the data (IB, SK), drafting of the manuscript (IB, SK, TK, GW), critical revision of the manuscript (TK, GW), supervision (GW). All authors read and approved the final manuscript.

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Trends in patient satisfaction in Dutch university medical centres: room for improvement for all

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Published as: Kleefstra et al. BMC Health Services Research (2015) 15:12 DOI 10.1186/s12913-015-0766-7

Abstract

Background
Results of patient satisfaction research provide hospitals areas for quality improvement. Although it may take several years to achieve such improvement, not all hospitals analyse changes in patient satisfaction over time structurally. Consequently, they lack information from patient's perspective on effectiveness of improvement programmes. This study presents a trend analysis of the patient satisfaction scores in the eight university medical centres in the Netherlands. We focus on the trends, effect size and its consequences for improving patient-centred care.

Methods
The Core Questionnaire for the assessment of Patient Satisfaction (COPS) was used in four large-scale nationwide comparative studies (2003-2009). Data were analysed at a national level, and for each academic hospital separately. We analysed the polynomial contrasts in the four measurements by performing an univariate analysis of variance (ANCOVA). The trend lines are presented graphically, with the means, SD, F-statistics and the standardized effect size including confidence intervals expressed by Cohen's d. By analysing the (logit transformed) percentages of very satisfied patients we examined the change scores.

Results
The dataset consisted of 58,055 inpatients and 79,498 outpatients. Significant positive trends were found on national level and hospital level, especially in outpatient departments. Improvement was especially seen on the dimensions information and discharge and aftercare. Not only university medical centres with a lower score at the start, but surprisingly some best practices and university medical centres with a high initial score improved.

Conclusions
We conclude that significant trends in patient satisfaction can be identified on a national and a hospital level, in inpatient and outpatient departments. The observed effect size expressed by Cohen's d is rather small. Hospitals have found room for improvement, even hospitals with initial high satisfaction scores. We recommend that hospitals monitor their patient satisfaction scores over time and relate these to quality interventions and organizational changes. Furthermore, we recommend to

expand the research to subgroups of unsatisfied patients to improve patient-centred care for all patients.

Introduction

Over the last decades hospitals have been working on improving patient-centred care by developing and implementing quality improvement strategies and activities based on the patient's perspective [1-6]. The Institute of Medicine defines patient-centred care as: "Providing care that is respectful of and responsive to individual patient preferences, needs, values, and ensuring that patient values guide all clinical decisions" [7]. Results of patient experience and satisfaction research can inform hospitals of areas requiring improvements from patient's perspective [2, 3, 5, 6, 8]. In fact, the continuous assessment of patient's perspective is increasingly recognized as a major component of quality management [9]. Several studies have shown that significant improvement in most aspects of patient experience or satisfaction can be achieved over time [2, 5, 6, 8-12], provided that organizations have adopted a strategic approach to patient focus [11, 13]. This cultural change will probably take several years to be implemented. Consequently, it takes time to achieve improvement in patient satisfaction or experiences [3, 11]. Therefore, by analysing patient satisfaction scores over time, hospitals can monitor whether their quality interventions result in better outcomes and assess hereby the effectiveness of improvement programmes from the perspective of the patient [2-6, 11-13]. In practice, however, not all hospitals analyse changes in patient satisfaction scores over time structurally [3, 4, 6]. As a consequence, these hospitals lack information on effectiveness of their programmes for improving patient-centred care.

It is therefore no surprise that only a few studies were performed concerning trends over time in patient satisfaction on a national or organizational level. There is also hardly any research that links trends to improvements made based on previous patient satisfaction research. For instance, the NHS national surveys show significant improvement in most aspects of patient's experiences of inpatient and outpatient care and treatment in the UK (NHS, 2003-2009) [2, 5]. In South Korea, patient satisfaction increased dramatically in inpatient and outpatient care (1989-2003), due to governmental policies on increased health expenditures, better availability of resources and quality improvement efforts [10]. In Denmark, patient satisfaction results on a national level for outpatients improved, but remained unchanged for inpatients (1999-2006). Changes in patient satisfaction showed a so called ceiling effect: the best scoring departments had little or no room for improvement in patient satisfaction [6].

Patient surveys are generally accepted tools to monitor quality performance from the perspective of the patient, provided that the results should be attributed to smaller units than the organizational level, as well as combined with qualitative and organizational data [4-6, 11]. At the same time, there are some objections to the use of continuous patient satisfaction surveys for quality improvement. First, some consider patient satisfaction as a subjective judgment, and difficult to interpret [2, 14]. Second, in general patients tend to be highly satisfied with their hospital care and these high scores are said to be difficult to improve. As a consequence, patient satisfaction questionnaires often show a skewed score distribution [9, 15-17]. Activities highly successful in improving other indicators can increase the already high scores by only a limited extent [14, 18].
Indeed, research regarding trends in patient satisfaction shows that the biggest improvement takes place in departments with originally the lowest patient satisfaction and that departments with high scores hardly can improve theirs [6, 19]. Such ceiling effect would imply that repeated measurements tend to lose their impact over time. Once an acceptable score for hospital standards has been achieved it would become difficult to develop successful initiatives that lead to further improvement [6]. This would be a serious obstacle to improving patient-centred health care based on patient satisfaction scores.
In this study we investigate patient satisfaction data from the eight university medical centres in the Netherlands. They performed large scale nationwide comparative studies with the same instrument and the same procedure two-yearly from 2003 [20]. The added value of these as compared to earlier studies is that feedback was detailed on a low organizational level, i.e., inpatient and outpatient departments, with next to the quantitative, qualitative data collected by asking patient's free-text comments. Based on these measurements, the university medical centres made quality interventions such as redesigning the patient flow to reduce waiting times and increase accessibility, distributing patient leaflets, creating websites for patients and organizing courses in hospitality for staff. This cycle of measurement and improvement was repeated with the same methods three times until 2009.
Using the data of these four measurements, we addressed the following questions. (1) Can significant trends in patient satisfaction be identified on a national and a hospital level, in inpatient and outpatient departments? (2) Do hospitals with initial high satisfaction scores find room for improvement? By answering these questions,

we hope to contribute to the discussion whether patient surveys over time offer structural opportunities for monitoring and improving patient-centred care.

Methods

In a time series design we analysed patient satisfaction data collected from all eight university medical centres in the Netherlands [20]. These data covered the measurements for 2003, 2005, 2007 and 2009.

Instrument

Patient satisfaction was assessed using the Core Questionnaire for the assessment of Patient satisfaction (COPS). The COPS is a reliable and valid Dutch questionnaire in a clinical and outpatient version. Further information on the development and validation of the COPS questionnaire can be found in an earlier publication [20]. The COPS consists of six quality dimensions: *admission/reception* (2 or 3 items), *nursing care* (2 items), *medical care* (2 items), *information* (4 items), *autonomy* (2 or 3 items) and *discharge and aftercare* (2 or 3 items). The six dimensions of the inpatient and outpatient version are equal, however some questions are different, given the different nature of the inpatient and outpatient departments. For three dimensions the content and number of items thus slightly varied. Patients can rate their satisfaction on a 5-point Likert-scale with answering categories 'unsatisfied' (=1), 'somewhat satisfied' (=2), 'rather satisfied' (=3), 'quite satisfied' (=4) and 'very satisfied' (=5). The labels were spaced as comparably as possible from a semantic point of view. An intentionally skewed wording of answering categories was chosen, i.e. with one label 'negative' and four labels 'positive', as patients are likely to give answers to positively framed responses rather than to negative ones [9, 21]. Dimension scores were composed by adding up the item scores and dividing the resulting total score by the number of items. To establish the overall satisfaction we calculated the mean of the six dimensions of the COPS. Patients could write down comments using free text space after every dimension and at the end of the questionnaire. These comments were used by the hospitals to make quality improvements, but they were not part of the analyses in this trend study. The questionnaire included patient's background characteristics such as age, gender and education. Finally, patients were asked to rate their general health on a 5-point scale (1= bad, 2=moderate, 3=good, 4=very good, 5=excellent).

Sample and procedure

The COPS was used in four large-scale nationwide comparative studies in all eight university medical centres in the Netherlands. These university medical centres are geographically spread throughout the Netherlands. The capital Amsterdam has two centres. In 2011 the eight hospitals had on average 948 beds (range 715-1,320), on average 6,887 full-time equivalent professionals (range 4,113-9,674), on average 31,430 admissions (range 21,161-41,797), comprehending on average 204,347 days (range 125,811-288,799), on average 138,260 first outpatient visits (range 123,435-157,665), an average length of stay of 6.7 days (range 5.6-8.7). The main tasks are complex patient care, experimental research and education [22, 23].
The study sample was stratified according to the main medical specialties, i.e. 17 clinical and 27 outpatient specialties. Based on pilot studies [20, 21, 24] two hundred fifty consecutive patients were approached from every medical specialty in each hospital. We did not perform a power analysis to confirm the preferred power level. A coordinator was appointed in each university medical centre and instructed to ensure a comparable approach across eight hospitals.
In 2003 and 2005, the COPS was sent to patients within two months after admission or an outpatient visit, accompanied by a letter from the hospital. Specific information was given in the letter in English, French, German, Spanish, Turkish and Moroccan, inviting patients to ask the help of others in case they were unable to read Dutch. Questionnaires could be returned to an independent research organization in a pre-stamped return envelope. A reminder was sent after two weeks.
In 2007 and 2009, the same procedure was followed, supplemented by the possibility to complete the questionnaire online using a personal code in the letter. It remained possible to send the questionnaire back by mail. During all four measurement periods a helpdesk using phone and email was installed for patients needing support. Prior to each measurement round the university medical centres reported the quality interventions they made based on the previous measurement to the independent research organization.

Analyses

To answer our first research question, we examined the presence of significant trend lines on a national and a hospital level [25], for inpatient and outpatient departments. We analysed the polynomial contrasts in the four measurements by performing a univariate analysis of variance (ANCOVA). Patient's age, education and health status, which are known to influence patient satisfaction, were significantly different across the four measurements. Therefore, these were taken as a covariate in the

analyses. As multilevel analyses on this data in an earlier study [26] revealed that differences in satisfaction scores were mainly determined at the patient level and to a very little extent at the department and the hospital level (ICC's between 0 and 0.04), it was considered unnecessary to account for the hierarchical structure of the data. The confidence intervals were adjusted for multiple comparisons by Bonferroni. Subsequently, we determined the effect of the trend line. The effect of a polynomial contrast is determined by the number of peaks and falls in the curve. The following contrasts are possible:

- Linear, i.e., a line that has no peak or fall and can be increasing or decreasing,
- Quadratic, i.e., a curve with a peak or fall and,
- Cubic, i.e., a curve with two bending points.

If there is more than one significant trend line, the smallest significance level indicates the dominant trend line. If the significance of both trend lines is close, the plot indicates the trend line. We only report significant trend lines. The trend lines are presented graphically, with the means, SD, F-statistics and the standardized effect size including confidence intervals expressed by Cohen's d. Cohen's d is an accepted measure of the standardized effect size. Using Cohen's d facilitates interpretation of change since it can be compared to standards of size and a large amount of literature [27]. We related the interpretation of the effect size to Cohen's conventions [28, 29], in absence of effect sizes (/Cohen's d) in previous patient satisfaction publications: a standardized effect size of 0.2 is considered 'small' in magnitude, an effect size of 0.5 'medium' and an effect size of 0.8 'large'.
To answer our second research question, we first checked our data for two possible ceiling effects. First, the score limitation at the top of a scale [9, 30] of the questionnaire, i.e. the percentage of patients giving the highest possible score (namely 5='very satisfied'). The COPS was designed with an intentionally skewed wording of answering categories to prevent such ceiling effect. In clinical research (health status questionnaires) a ceiling effect of 15 per cent is considered the maximum acceptable [31, 32]. We calculated the overall percentage very satisfied patients by adding the 'very satisfied'-scores per item, divided by the number of items in the questionnaire. Furthermore, we computed the absolute increase of percentage very satisfied patients between 2003 and 2009 to indicate change. We logit transformed the percentage scores to account for the potential numerical ceiling effect, i.e. the fact that it is more difficult to achieve a change from 90 to 95 per cent than it is form 60 to 65 per cent [33]. Data were analysed using IBM SPSS 20.0.

Results

Sample

The total dataset of the inpatient departments consisted of 58,055 patients, the dataset of outpatients of 79,498 patients.

Table 1 *Number of patients in de datasets, per year, hospital and total*

	Inpatient					Outpatient				
	2003	2005	2007	2009	Total	2003	2005	2007	2009	Total
UMC										
1	2,206	1,943	1,863	1,605	7,617	2,167	2,428	2,441	2,325	9,361
2	1,483	1,399	1,654	1,340	5,876	2,156	1,820	2,093	1,869	7,938
3	1,978	2,040	1,564	1,704	7,286	2,714	2,687	2,745	2,962	11,108
4	1,611	1,627	1,301	1,806	6,345	2,175	2,237	2,850	1,876	9,138
5	1,800	1,818	2,095	1,677	7,390	2,565	2,320	3,185	3,151	11,221
6	2,470	1,994	1,910	1,758	8,132	2,651	2,539	2,707	2,134	10,031
7	2,290	2,245	2,234	1,819	8,588	2,870	2,637	2,375	2,192	10,074
8	1,532	1,960	1,956	1,373	6,821	3,816	2,420	2,653	1,738	10,627
Total	**15,370**	**15,026**	**14,577**	**13,082**	**58,055**	**21,114**	**19,088**	**21,049**	**18,247**	**79,498**

Patient visited the 17 (clinic) and 22 (outpatient) main medical specialties in the Netherlands. The response rates of 2003, 2005 and 2007 were consistently 53 per cent. In 2009 the response rate was 42 per cent. The patient's level of education, age and health status differed significantly between the four measurements. In 2009 both the inpatient and outpatient respondents were older, higher educated and assessed their health status as less negative compared to the earlier measurements (see Table 2 and 3).

Table 2 *Patient characteristics inpatient departments (%)*

		2003	2005	2007	2009
Gender	Male	50.3	49.0	48.6	48.5
	Female	49.7	51.0	51.4	51.5
Education*	None	15.1	14.1	13.2	12.2
	Lower education	26.1	25.5	24.2	22.9
	Middle education	29.6	30.6	30.9	31.7
	Higher education	8.7	8.7	8.8	8.5
	College	14.5	14.7	15.7	17.4
	University	6.1	6.4	7.2	7.3
Age*	Younger than 20 years	14.7	13.7	12.4	11.0
	20-39 years	17.7	16.8	16.0	16.1
	40-54 years	20.4	19.4	19.0	18.9
	55-59 years	10.0	9.8	9.9	9.5
	60 years and older	37.3	40.3	42.7	44.5
Health status*	Bad	5.6	5.3	5.8	4.7
	Moderate	27.1	27.3	27.5	26.5
	Good	45.3	45.2	45.1	46.6
	Very good	13.9	14.2	14.3	15.1
	Excellent	8.0	8.0	7.3	7.2

* Pearsons chi-square < 0.05

Table 3 *Patient characteristic outpatient departments (%)*

		2003	2005	2007	2009
Gender	Male	43.2	43.9	44.3	43.7
	Female	56.8	56.1	55.7	56.3
Education*	None	13.9	11.7	11.8	9.3
	Lower education	23.5	22.5	21.6	21.0
	Middle education	29.4	30.5	30.2	32.1
	Higher education	10.1	9.7	10.1	9.7
	College	15.6	17.2	17.5	18.7
	University	7.5	8.3	8.8	9.2
Age*	Younger than 20 years	14.7	12.2	11.4	9.2
	20-39 years	19.7	19.3	17.3	16.8
	40-54 years	22.0	22.7	21.8	20.9
	55-59 years	9.9	10.7	10.3	10.1
	60 years and older	33.7	35.2	39.2	43.0
Health status*	Bad	5.3	5.0	4.8	4.4
	Moderate	31.7	29.4	30.8	30.8
	Good	45.4	46.8	46.5	47.0
	Very good	12.0	12.6	12.6	12.9
	Excellent	5.5	6.1	5.3	4.9

* Pearsons chi-square < 0.05

Are significant trends in patient satisfaction found on a national and a hospital level, in inpatient and outpatient departments?

The overall patient satisfaction scores on a national level showed a significant linear increase in the time period 2003-2009 for inpatient and outpatient departments. For the inpatients the mean satisfaction increased 0.05 on a 5 point scale: F (df) 3.857 (3), Cohen's d 0.07 (95 per cent CI 0.04-0.10), p=0.009; for outpatients 0.09 F (df) 18.468 (3), Cohen's d 0.12 (95 per cent CI 0.09-0.15), p < 0.001.
Figure 1 shows the significant trends in patient satisfaction per dimension for each university medical centre. The statistics of the trends (means, SD, F-statistics and Cohen's d) are found in Table 4 and Table 5.

Table 4 *Trend statistics for significant trend lines per university medical centre for inpatient departments (trend, means, SD, absolute mean difference, Cohen's d (95% CI), F-statistics, p-value, N)*

	Trend	Year	Mean	Absolute mean difference (2003-2009)	SD	Cohen's d (95% CI)	F (df)	p-value	N
UMC 1 Discharge and aftercare	⟋	2003	3.42	0.17	1.03	0.16 (0.08-0.24)	6.322 (3)	<0.001	4,983
		2005	3.47		0.99				
		2007	3.52		0.99				
		2009	3.58		0.99				
UMC 1 Overall	⟋	2003	3.75	0.11	0.75	0.16 (0.08 -0.25)	5.443 (3)	0.001	4,348
		2005	3.78		0.72				
		2007	3.84		0.73				
		2009	3.87		0.74				
UMC 2 Admission	⋁	2003	3.94	0.03	0.80	-	8.107 (3)	<0.001	5,139
		2005	3.83		0.81				
		2007	3.86		0.83				
		2009	3.97		0.80				
UMC 2 Nursing care	⋁	2003	3.95	0.01	0.87	-	8.428 (3)	<0.001	5,336
		2005	3.83		0.88				
		2007	3.83		0.90				
		2009	3.96		0.88				
UMC 5 Admission	⋁	2003	3.96	0.07	0.83	-	6.13 (3)	<0.001	6,415
		2005	3.93		0.80				
		2007	3.92		0.86				
		2009	4.03		0.83				
UMC 5 Information	⟋	2003	3.66	0.11	0.88	0.11 (0.08-0.19)	6.142 (3)	<0.001	6,508
		2005	3.64		0.85				
		2007	3.72		0.84				
		2009	3.76		0.87				
UMC 5 Discharge and aftercare	⟋	2003	3.52	0.16	1.02	0.16 (0.08-0.24)	9.397 (3)	<0.001	4,872
		2005	3.47		0.98				
		2007	3.55		0.98				
		2009	3.68		0.97				

⟋ = significant linear positive trend line, p ≤ 0.001

⋁ = significant quadratic trend line

On a hospital level patient satisfaction in the inpatient clinics of two out of eight university medical centres showed a significant positive trend line on the dimension *discharge and aftercare* and one on the dimension *information*. UMC 2 showed two significant quadratic trend lines, on the dimensions *admission* and *nursing care*, UMC 5 showed a quadratic trend line on the dimension *admission*. In both hospitals, satisfaction on these dimensions decreased in 2005 and remained stable in 2007, but showed an increase in 2009. The overall patient satisfaction score of university medical centre 1 shows a significant positive amelioration.

Table 5 *Trend statistics for significant trend lines per university medical centre for outpatient departments (trend, means, SD, absolute mean difference, Cohen's d (95% CI), F-statistics, p-value, N)*

	Trend	Year	Mean	Absolute mean difference (2003-2009)	SD	Cohen's d (95% CI)	F (df)	p-value	N
UMC 1 Reception	/	2003	3.75	0.16	0.81	0,19 (0.13 - 0.25)	12.867 (3)	<0.001	8,648
		2005	3.80		0.78				
		2007	3.87		0.77				
		2009	3.90		0.76				
UMC 1 Nursing care	/	2003	3.77	0.13	0.87	0.15 (0.09-0.22)	7.002 (3)	<0.001	8,661
		2005	3.82		0.84				
		2007	3.88		0.81				
		2009	3.90		0.81				
UMC 1 Medical care	/*	2003	4.00	0.19	0.96	**0.20 (0.14-0.26)**	11.746 (3)	<0.001	8,674
		2005	4.10		0.92				
		2007	4.10		0.90				
		2009	4.18		0.86				
UMC 1 Information	/*	2003	3.61	0.16	0.90	**0.20 (0.13-0.27)**	8.143 (3)	<0.001	6,831
		2005	3.66		0.87				
		2007	3.70		0.86				
		2009	3.78		0.84				
UMC 1 Autonomy	/*	2003	3.70	0.16	0.83	**0.20 (0.14-0.27)**	12.825 (3)	<0.001	8,505
		2005	3.82		0.79				
		2007	3.79		0.79				
		2009	3.86		0.74				
UMC 2 Information	/	2003	3.64	0.16	0.92	0.18 (0.11-0.25)	5.229 (3)	0.001	5,636
		2005	3.70		0.86				
		2007	3.75		0.84				
		2009	3.80		0.85				
UMC 3 Reception	S	2003	3.84	0.07	0.75	-	12.229 (3)	<0.001	10,242
		2005	3.81		0.77				
		2007	3.92		0.74				
		2009	3.91		0.75				
UMC 3 Nursing care	S	2003	3.86	0.06	0.80	-	11.835 (3)	<0.001	10,252
		2005	3.83		0.83				
		2007	3.94		0.78				
		2009	3.92		0.78				
UMC 4 Autonomy	∧	2003	3.70	0.01	0.86	-	6.183 (3)	<0.001	8,268
		2005	3.79		0.82				
		2007	3.78		0.79				
		2009	3.71		0.81				
UMC 5 Reception	/	2003	3.93	0.11	0.73	0.16 (0.10-0.21)	7.083 (3)	<0.001	10,349
		2005	3.95		0.72				
		2007	3.98		0.72				
		2009	4.04		0.69				
UMC 5 Nursing care	/	2003	3.95	0.10	0.78	0.15 (0.09-0.20)	8.512 (3)	<0.001	10,376
		2005	3.95		0.77				
		2007	4.01		0.73				
		2009	4.06		0.73				
UMC 5 Information	/	2003	3.71	0.16	0.86	0.19 (0.13-0.25)	8.942 (3)	<0.001	8,271
		2005	3.76		0.85				
		2007	3.78		0.84				
		2009	3.87		0.83				

	Trend	Year	Mean	Absolute mean difference (2003-2009)	SD	Cohen's d (95% CI)	F (df)	p-value	N
UMC 5 Aftercare	/	2003	3.38	0.16	1.01	0.17 (0.11-0.24)	5.311 (3)	0.001	6,771
		2005	3.47		0.98				
		2007	3.46		0.97				
		2009	3.55		0.96				
UCM 5 Overall	/	2003	3.85	0.12	0.70	0.18 (0.10-0.25)	5.237 (3)	0.001	5,629
		2005	3.89		0.69				
		2007	3.89		0.69				
		2009	3.97		0.66				
UMC 6 Reception	/	2003	3.92	0.10	0.72	0.13 (0.07-0.19)	10.038 (3)	<0.001	9,334
		2005	3.92		0.73				
		2007	3.99		0.70				
		2009	4.01		0.69				
UMC 6 Nursing care	/	2003	3.90	0.09	0.77	0.12 (0.06-0.18)	8.611 (3)	<0.001	9,331
		2005	3.91		0.78				
		2007	3.99		0.75				
		2009	3.99		0.74				
UMC 6 Medical care	/	2003	4.02	0.14	0.94	0.14 (0.09-0.20)	14.475 (3)	<0.001	9,336
		2005	4.02		0.93				
		2007	4.14		0.87				
		2009	4.15		0.85				
UMC 6 Information	/	2003	3.63	0.17	0.90	0.19 (0.13-0.26)	14.539 (3)	<0.001	7,512
		2005	3.66		0.90				
		2007	3.78		0.82				
		2009	3.80		0.86				
UMC 6 Autonomy	/	2003	3.80	0.09	0.78	0.12 (0.06-0.18)	5.319 (3)	0.001	9,157
		2005	3.84		0.79				
		2007	3.88		0.76				
		2009	3.89		0.74				

	Trend	Year	Mean	Absolute mean difference (2003-2009)	SD	Cohen's d (95% CI)	F (df)	p-value	N
UMC 6 Aftercare	/	2003	3.37	0.14	1.01	0.14 (0.07-0.21)	7.327 (3)	<0.001	6,353
		2005	3.45		0.98				
		2007	3.53		0.97				
		2009	3.51		0.99				
UMC 6 Overall	/	2003	3.79	0.12	0.72	0.17 (0.09-0.25)	9.956 (3)	<0.001	5,385
		2005	3.83		0.71				
		2007	3.93		0.66				
		2009	3.91		0.68				
UMC 8 Reception	/	2003	3.75	0.12	0.78	0.16 (0.10-0.21)	6.501 (3)	<0.001	9,779
		2005	3.76		0.77				
		2007	3.82		0.77				
		2009	3.87		0.76				
UMC 8 Information	/	2003	3.64	0.11	0.87	0.13 (0.06-0.19)	6.136 (3)	<0.001	7,567
		2005	3.61		0.89				
		2007	3.71		0.84				
		2009	3.75		0.84				

/ = significant linear positive trend line, $p \leq 0.001$
∧ = significant quadratic trend line
∿ =significant cubic trend line
* = significant linear trend line and Cohen's d>0.2

In the outpatient clinics we found five university medical centres that showed significant positive trend lines on the dimension *information*, four that showed a significant positive trend line on the dimension *reception*. Three university medical centres show significant positive trend lines on *nursing care* and two out of eight university showed positive trend lines on the dimensions *medical care*, *autonomy* and *discharge and aftercare*. UMC 3 showed two significant cubic trend lines, on the

dimensions *reception* and *nursing care*. Satisfaction on these dimensions decreased in 2005, but showed an increase in 2007, which was consolidated in 2009. UMC 4 showed a significant quadratic trend line on the dimension *autonomy*: satisfaction on this dimension increased in 2005 and remained stable in 2007, but showed a decrease in 2009. The overall patient satisfaction scores of university medical centre 5 and 6 show a significant positive increase.
University medical centre 1 showed three significant ($p \leq 0.001$) linear positive trend lines with an observed effect size expressed by Cohen's d of 0.2: *medical care* (Cohen's d 0.20, 95% CI 0.14-0.26), *information* (Cohen's d 0.20, 95% CI 0.13-0.27) and *autonomy* (Cohen's d 0.20, 95% CI 0.14-0.27).

Do hospitals with initial high satisfaction scores find room for improvement?

For inpatient departments, 26 per cent of the patients is 'very satisfied' on average (range 24 to 27 per cent in 2003 and 22 to 27 per cent in 2009). Table 6 shows the percentages very satisfied patients, their logit transformed scores and the change on both scores between 2003 and 2009 for inpatient departments on a hospital level.

Table 6 *Percentage very satisfied patients, logit transformed score and change between 2003 and 2009 in inpatient departments*

UMC	2003		2009		Change	
	% very satisfied	Logit transformed score	% very satisfied	Logit transformed score	in % very satisfied	in logit transformed score
UMC 7	26.8	3.29	27.2	3.30	0.4	0.01
UMC 3	26.7	3.28	26.9	3.29	0.2	0.01
UMC 5	26.2	3.27	26.9	3.29	0.7	0.03
UMC 6	25.8	3.25	25.0	3.22	−0.8	−0.03
UMC 8	25.1	3.22	26.1	3.26	1.0	0.04
UMC 4	25.0	3.22	22.3	3.10	−2.7	−0.11
UMC 1	24.6	3.20	25.8	3.25	1.3	0.05
UMC 2	23.6	3.16	24.3	3.19	0.6	0.03

The university medical centres having the highest percentage very satisfied patients in 2003 (UMC 7 and 3) still showed an increase in very satisfied patients, although not as strongly as university medical centres with a lower initial proportion of very satisfied patients. Two average performing university medical centres show a decrease in satisfaction.

For the outpatient departments, 24 per cent of the patients is 'very satisfied' on average (range 21 to 25 per cent in 2003 and 23 to 28 per cent in 2009). Table 7 shows the percentage of very satisfied patients, their logit transformed scores and the change on both scores between 2003 and 2009 for outpatient departments on a hospital level.

Table 7 *Percentage very satisfied patients, logit transformed score and change between 2003 and 2009 in outpatient departments*

UMC	2003		2009		Change	
	% very satisfied	Logit transformed score	% very satisfied	Logit transformed score	in % very satisfied	in logit transformed score
UMC 7	25	3.22	26.6	3.28	1.6	0.06
UMC 5	24.7	3.21	27.7	3.32	3	0.11
UMC 2	23.6	3.16	25.7	3.25	2.1	0.09
UMC 3	23.4	3.15	22.8	3.13	−0.6	−0.03
UMC 4	23.2	3.14	22.5	3.11	−0.7	−0.03
UMC 6	22.8	3.13	24.8	3.21	2	0.08
UMC 8	22.2	3.10	22.9	3.13	0.7	0.03
UMC 1	21.2	3.05	24.4	3.19	3.2	0.14

The highest increase in very satisfied patients was found in the university medical centre with initially the lowest percentage of very satisfied patients (UMC 1). The smallest change in very satisfied patients was found in UMC 3, 4 and 7, average to low performers. Two university medical centres with the highest percentage of very satisfied patients (UMC 7, 5 and 2) still showed room for improvement.

Discussion

Our study shows significant positive trend lines in patient satisfaction in the university medical centres in the period 2003-2009 on a national level. Also, several significant positive trend lines are found on a hospital level, especially in the outpatient departments. This is contrary to the fluctuating Dutch consumer confidence [34] and, according to the Dutch Health care Consumer Panel, the declining confidence in Dutch hospitals: confidence decreased from 76 per cent of the respondents in 2002 to 66 per cent of the respondents in 2009 [35]. However, these increasing patient satisfaction scores are in line with the results from studies in Denmark, England, South Korea and the Netherlands [2, 6, 10, 36-38]. An explanation for the increased patient satisfaction could be the quality interventions based on the results of the previous measurements. The dimensions *information* and *discharge and aftercar*e showed most room for improvement in each measurement, with mean scores lower than other dimensions. Indeed, most of the self-reported quality interventions made by the university medical centres concerned these dimensions. The results show significantly increased patient satisfaction on these dimensions in several university medical centres.

In comparing studies, the standardized effect size is a necessary statistic to provide some indication of practical significance of an effect [39, 40]. To the best of our knowledge, however, this is the first study to report the magnitude of the change in patient satisfaction scores by means of Cohen's d [28]. As a result, common effect sizes of patient satisfaction research are unknown. We know from literature that, when the sample size is large, the observed effect size is a good estimator of the true effect size [41]. However, there has always been discussion about the strong negative correlation between observed effect sizes and sample sizes [41, 42]. As a result, large sample sizes studies like ours tend to report small or trivial effects. It is possible to obtain statistically significant results even for extremely small effects in large samples. On the other hand, large sample sizes give researchers the assurance of being capable of detecting an effect, even if it is small [41, 42]. The observed effect size of differences found, as referred to Cohen, is limited. However, it is not only the magnitude of effect that is important. Also, its practical value must be considered [29]. For instance, the fact that these four large scale nationwide studies are comparable in instrument, methods, procedures and number of patients participating per hospital and specialty, gives weight to the relevance of the scores. Small effects may have enormous implications in a practical context, they may accumulate over time to become large effects and they may be quite important theoretically [40]. For instance, a small difference could nevertheless be important for patients. Whether the effects in patient satisfaction we observed are 'practically relevant' is hard to answer in the absence of other publications reporting effect sizes, and in the absence of other measures to compare the changes in patient satisfaction scores with.

According to the threshold of 15 per cent applied in health status questionnaires [31, 32], our study shows a ceiling effect: we found 24 per cent of the outpatients and 26 per cent of the patients in inpatient departments were 'very satisfied'. However, the overall scores in our study are not as high as scores found in a study in inpatient departments in Norway [15]. Bjertnaes and colleagues found a mean satisfaction score of 4.2 on a 5-point Likert scale, where 5 represents the best score. Forty per cent of the patients gave the highest score. In our study for inpatients the results were a mean of 3.9 and 26 per cent respectively. Therefore, the decision to choose the intentionally skewed answering categories of the COPS in order to limit the ceiling effect of the questionnaire, seems to have worked out well [9, 21].
High patient satisfaction scores do not mean there is no room for improvement [15, 43]. In our data – even though changes are small -, a substantial number of scores is increasing over time, when controlled for a potential numerical ceiling effect, even in hospitals with initial high scores. Also, the biggest change is not found by definition in hospitals with a low initial score. We agree with Friesner and colleagues, who state that in patient satisfaction research the focus should be on maintaining the high mean scores while reducing the variation in responses [18]. Our data show that this was the case for almost all the university medical centres: de SD decreased in 2009 in inpatient and outpatient departments, with the exception of the SD of UMC 7 in inpatient and outpatient departments (see Table 8). Furthermore, the use of patient satisfaction research for quality improvements should preferably focus on the low scoring subgroups of patients while maintaining the high scores. Knowledge of the problems experienced within these subgroups of unsatisfied patients is valuable for tailoring quality improvement work [15, 44] and may improve patient-centred care for all patients.
Finally, high patient satisfaction scores dropping down in time could indicate a stagnation of quality improvement. From this point of view monitoring patient satisfaction scores in time could be a useful indicator for the supervision and regulation of quality of care by, for instance, the national health care inspectorate.

Table 8 *Overall UMC SD-scores in time*

		Inpatient	Outpatient
UMC 1	2003	0.75	0.76
	2009	0.74	0.70
UMC 2	2003	0.74	0.74
	2009	0.69	0.70
UMC 3	2003	0.69	0.73
	2009	0.70	0.68
UMC 4	2003	0.78	0.73
	2009	0.74	0.73
UMC 5	2003	0.72	0.70
	2009	0.71	0.66
UMC 6	2003	0.68	0.72
	2009	0.68	0.68
UMC 7	2003	0.69	0.68
	2009	0.70	0.71
UMC 8	2003	0.74	0.71
	2009	0.72	0.70

Strength and limitations

Given our large sample size, the uniform procedure followed by all eight university medical centres, we could well establish reliable changes in patient satisfaction over time. Another strength of our approach is that the quantitative results were supplemented by patient comments reported at department level, thus consisting a useful base for quality interventions [45]. Furthermore, the survey time of all university medical centres was equal and performed at the same time in between-hospital comparisons [16, 46].

However, our study also has some limitations. We did not perform a power calculation at the start of the measurements. Because of the significant differences found in our study, a post hoc power analysis is not of added value. In fact, the applications of post hoc power analyses are extremely limited [47]. It is for example not recommended because the observed power is almost always a biased estimator of the true power. If the goal is to determine the sample size needed to detect a practically important effect, one can refer to the power tables mentioned by Cohen [27, 41].

Also, the response rate dropped in 2009 from 53 to 42 per cent, while satisfaction scores improved in 2009. Although the response rate was still reasonable [48], satisfied patients may have responded in particular. Given the anonymity of the study, no data to perform a non-response analysis were available. However, former research showed that the impact of non-response bias on satisfaction questionnaires of hospitalized patients is relatively small [9, 49]. Furthermore, the satisfaction scores in case of significant trends not only improved in 2009, but also in 2005 and 2007.

Finally, the role of quality improvement activities by the hospitals is difficult to establish in this research. Although the results of the measurements gave direction to the topics of quality improvement activities the hospitals made, it is not possible to dissociate quality improvements from general organizational changes. Patient satisfaction scores may be difficult to interpret [2, 14] and are influenced by many external factors. The environment in hospitals changes constantly. For instance, the economic situation [50], staff satisfaction [51], organizational circumstances [6, 51] and public reporting of the results, especially for hospitals with low scores at the start are known factors to influence patient satisfaction results [6, 8, 14, 19, 52]. However, such external incentives alone are insufficient drivers of improvement efforts [11, 53]. Enhancing internal motivation by integrating the cycle of measurement and improvements based on the results in the quality management system of university medical centres almost certainly resulted in increased awareness about the patient's perspective.

Conclusions

We conclude that significant trends in patient satisfaction can be identified on a national and a hospital level, in inpatient and outpatient departments even though the observed effect size expressed by Cohen's d is rather small. In other words, hospitals have found room for improvement, even when their scores were high initially. Our results indicate that monitoring patient satisfaction scores over time results may give valuable information on the effectiveness of quality programmes for hospitals from the patient's perspective. Also, programmes targeted at problem areas identified by patients might improve patient satisfaction scores. The quality interventions the hospitals made based on previous measurements and the increased awareness of the patient's perspective could be possible mechanisms leading to the increased patient satisfaction scores. However, to complete the picture, future patient satisfaction research should keep track of external an organizational circumstances that might influence these scores. In the original measurement reports sent to the university medical centres results were presented

on department level, so quality interventions could be tailored to department-specific targets. It would be valuable to also expand future research to identify subgroups of unsatisfied patients. In this way a twofold value is added: unsatisfied patients can indicate risks in quality or safety aspects in hospital care, and tailoring quality interventions to this subgroup can lead to improved patient-centred care for all patients.

Acknowledgements

The authors thank the NFU (Dutch Federation of University Medical Centres) for their willingness to be open about their patient's judgments and to be able to learn from them. We had full access to the data of the four measurements and are grateful for their support during this study. We also thank M.G.E. Verdam, MSc, department Medical Psychology and N. van Geloven, PhD, Clinical Research Unit, Academic Medical Centre Amsterdam for their statistical support.

Author's contributions

Concept and design (SK, TK, LZ, JH), collection of the data and literature (SK), statistical analysis and interpretation of the data (SK, LZ), drafting of the manuscript (SK, TK, LZ, JH), critical revision of the manuscript (TK, LZ, JH), supervision (JH). All authors read and approved the final manuscript.

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Patient rating sites as a new development in monitoring quality

Investigating the potential contribution of patient rating sites to hospital supervision: a mixed method study

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Abstract

Background
Over the last decades the patient perspective on health care quality has been unconditionally integrated into quality management. For several years now patient rating sites have been rapidly gaining attention. These offer a new approach towards hearing the patient's perspective on the quality of health care.

Objective
The aim of our study is to explore whether and how patient reviews of hospitals, as reported on rating sites, have the potential to contribute to health care inspector's daily supervision of hospital care.

Methods
Given the unexplored nature of the topic, a mixed method study was designed.
We performed two rounds of interviews with ten senior inspectors, addressing their use as well as their judgment on the relevance of review data from a rating site.

Results
All ten Dutch senior hospital inspectors participated in this research. The inspectors showed, at first, some reluctance to use the major patient rating site in their daily supervision. This was mainly because of objections such as worries about how representative they are, subjectivity and doubts about the relevance of patient reviews for supervision. However, confrontation with, and assessment of, negative reviews by the inspectors resulted in 23 per cent of the reviews being deemed relevant for risk identification. Most inspectors were cautiously positive about the contribution of the reviews to their risk identification.

Conclusions
Patient rating sites can be of value to the risk-based supervision of hospital care carried out by the health care inspectorate. Inspectors see it as an additional source of information to detect poor quality of care.

Introduction

Over the last decades the patient's perception of health care quality has been unconditionally integrated into quality management. Traditional patient satisfaction or experience surveys have become accepted tools for measuring health care quality. These tools were demonstrated to add valuable information to professional quality indicators and outcome measures [1, 2]. For several years now a new approach towards hearing the patient's perspective on the quality of health care, by the use of patient rating sites, has rapidly gained attention. These specialized internet rating sites allow patients to express and rate their experiences and satisfaction with health care providers and institutions. These ratings are intended to be a source of information on quality for other patients looking for health care providers [3-5]. This is especially the case in the US, Germany and the UK where many patients look for information on these sites. Their use is often stimulated by governments [6-11].

At first, the introduction of patient rating sites caused doctors and policymakers to raise several objections against the use of this information. They were supposed to be vulnerable to a number of pitfalls, such as being manipulated, showing a large variation in the number of ratings for hospitals and physicians, being emotionally burdensome for physicians who were either criticized or even not rated at all, or being biased by selection of patients, for example by an overrepresentation of dissatisfied patients [5, 7, 8, 10, 12, 13]. Furthermore, the average number of ratings for individual physicians was still low, implying that the assessments found for physicians may change over time when more patients took part [7]. Finally, information from rating sites was not case mix adjusted for patient characteristics such as age, level of education and health status. This is known to be necessary to prevent bias and thus allow the results to be properly interpreted [14, 15].

However, recent results from research on rating sites increasingly contradicted these arguments and showed their advantages. Ratings are mostly positive [4, 9, 10, 16, 17], and correlate with relevant clinical outcomes such as decreased mortality, readmissions, infection rates and decubitus [5, 7, 18-20]. These correlations are at least as strong as for the traditional paper surveys method [8, 18, 20]. Moreover, information on rating sites is up-to-date and might thus detect episodes of poor care or outliers in a more timely manner which a once-only survey might miss [8]. Also, these ratings can be given to all health care professionals and institutions while survey data regard, mostly, only one part of them. Last but not least, there is reason to believe that these rating sites will become commonplace. In fact, an increasing number of people consult the internet, looking for health care quality information. This rose from 19 per cent of North American adults in 2001 to 88 per cent in 2010; 24 per cent of them consulted review sites. Also the number of ratings has risen rapidly. In 2010 up to 16 per cent of all US physicians were reviewed [6, 7, 9, 20] while 37 per cent of physicians in Germany were reviewed in 2012 [21].
An awareness of 65 per cent of the US population and a usage of 23 per cent shows that patients are increasingly turning to online rating sites [22]. A German study showed that approximately 65 per cent of patients using a rating site have consulted a particular physician based on these ratings [3].

A recent scoping review concluded that although literature about the topic is still limited, social media, and especially patient rating sites, can become a fast and cheap way to gather information about the quality of care and could complement traditional methods [23]. Thus, while some caution interpreting the information is needed given methodological restrictions [23], using patient rating sites might help to detect poor performance [8, 18, 20, 24, 25]. It is therefore stated that neither physicians nor policy makers should underestimate the growing influence of ratings sites for patients in providing information, and for physicians in offering opportunities to improve the quality of their care, based on the concerns mentioned in reviews [3, 4].

Because of the potential value of the information for judging the quality of care, some supervisory bodies already use rating sites as an additional source of information [20, 26-29]. In England, for example, the Care Quality Commission (CQC) actively uses patient rating information from the NHS Choices website, alongside other rating sites, to identify potential risks to patient safety [24, 27]. Similar initiatives are found in Australia and Ireland [28].
The Dutch health care inspectorate's (IGZ) supervisory framework for risk detection in hospitals contains several process and outcome indicators developed to monitor the quality and safety of hospital care [30]. Although research shows that IGZ inspectors expect patients to be capable of detecting poor performance or risks that might be missed by regular inspection visits [28], patient's experiences are not yet included, systematically, in risk detection [31]. However, the inspectorate has become more interested in using information from rating sites to expand their methods to detect poor performance [32] having been stimulated by their colleagues working in health care supervision abroad and by the growing emphasis on patient participation [28]. In addition, an earlier study had already shown the value of the largest patient rating site in the Netherlands, ZorgkaartNederland, in assessing the risk-based supervision of elderly care [25].

The aim of our study is to explore whether patient experiences reported on rating sites can, in the eyes of health care inspectors, contribute to risk identification in hospital care.
We address three research questions:

1 Do health care inspectors already use patient experiences on rating sites in their daily supervision of hospitals and in what way?
2 Do inspectors expect patient experiences in hospitals, reported on rating sites, to contribute to their estimation of risk?
3 Does presenting, actively, patient reviews reported on the rating site ZorgkaartNederland alert inspectors in their estimation of risks to patient safety?

Methods

Given the unexplored nature of the topic, an exploratory, mixed method study was designed. We used a semi-structured interview approach along with an investigation of the judgment of the review data from a patient rating site. The Consolidated criteria for reporting qualitative research (COREQ) guidelines [33] were followed to ensure the completeness of the reporting.

Participants

For the supervision of hospital care, the IGZ divided the field into ten segments. Each segment covers ten hospitals on average with one senior inspector being responsible. Our sample thus consisted of ten senior inspectors.

Study design and procedure

Step 1 First round of interviews, exploring use and views

In January and February 2015 the primary researcher (SK) performed the first round of semi-structured interviews with the senior inspectors to establish their actual use in the supervision of health care, of patient experiences reported through rating sites and to explore their views on the potential contribution of such patient ratings (research questions 1 and 2). They were approached by email. Interviews were recorded on audiotape. Field notes were made during the interviews. The interviews lasted up to one hour. The first two interviews were discussed with two researchers (IB and RK) to ensure completeness and interview techniques.

Step 2 Selecting hospitals and reviews

After the first round of interviews, the inspectors were provided with texts of negative reviews on the rating site ZorgkaartNederland regarding one of the hospitals under their supervision. ZorgkaartNederland [34] is the Federation of Patient and Consumer Organization's (NPCF) non-commercial patient rating site [35]. It has the largest number of patient ratings in the Netherlands, with more than 265.000 ratings and 950.000 visitors per month. Patients can anonymously rate either the care organization or their care provider on a scale of 1 to 10 based on six factors: appointments, accommodation, employees, listening, information and treatment. The average of the six scores yields the overall rating, which is a valid summary of the factor's scores [36]. Patients have to clarify their rating with a written review checked by the website's editorial office. Patients are thus not allowed to give unfounded ratings. Even so, the editorial office checks the Internet Protocol (IP) address of every individual review, thus further diminishing the chance of receiving double ratings from one person. Patient characteristics are not asked for, so case mix correction is not possible [37].

We defined a rating as a quantitative score given to a hospital or doctor and a review as a written comment [17]. For each inspector we selected, at random, one hospital under their supervision. Only hospitals with at least 50 ratings in the period from November 1st 2013 until October 31st 2014 (one year) were eligible, in order to have a substantial number of ratings. Besides, at least ten negative ratings had to be available for this hospital, as the reviews belonging to these ratings were expected to contain most useful information for inspectorates [25]. Therefore, we categorized ratings based on the average overall rating according to the international known measure of recommendation, the Net Promotor Score. This measure considers the numbers 9 and 10 as positive ('promotors'), the numbers 7 and 8 as neutral and the numbers 0 till 6 as negative recommendations ('detractors') [38]. If the hospital had less than ten negative ratings, we selected, at random, another hospital.

Subsequently, we presented the negative reviews of the hospital selected in an Excel sheet, which was sent by email to the inspectors. We also provided the hospital's contextual information such as the mean rating, the total number of positive and negative ratings and the percentage of negative ratings, as compared to other hospitals. Inspectors were asked to score the relevance of each negative review for the health care inspectorate according to a previously developed ordinal assessment scheme [25]: 'no additional value (0)', 'relevant, information leads to a signal in the file of the organization (1)', 'relevant, information leads to further

investigations (2)', or 'relevant, information leads to immediate action (3)'. Inspectors filled in the score list and returned it to the researcher prior to the second interview.

Step 3 Scoring negative reviews and identifying underlying motives

The primary researcher (SK) performed a second round of interviews from April until June 2015. These interviews focused on the content of the negative reviews selected. The aim was to determine whether the reviews contained information on risks to patient safety (research question 3). The inspectors were asked what elements in the text of the reviews triggered their scoring. When reviews were labelled as 'further research required' and 'immediate action necessary' inspectors were asked whether these reviews provided information they already knew or which was new. These interviews were also tape recorded.

Analysis

All interviews were transcribed verbatim and were sent to the interviewees for triangulation. They were analysed following guidelines for qualitative research [39] and by using a digital qualitative data analysis programme, Atlas-ti [40]. Analysis was performed in parallel with the interviewing. In the first round of interviews the first interviews were analysed inductively, aiming to explore and identify relevant views and propositions. In the second round of interviews open coding (summarizing and categorizing the data) was gradually replaced with axial coding (confirmation of codes and the identification of broader relationships). Finally, data were clustered across interviews to derive common themes. The inspector's scoring of the negative reviews was analysed descriptively [25]. The arguments for the scores were described. We performed a member check by sending all quotes to all interviewees to ensure interpretation and hereby validity.

Results

Sample

All ten senior inspectors consented to participate in both interviews. Their average age was 53 (range 40-64). Seven were female. All inspectors were educated as a health care professional and had worked in a hospital for several years. The average number of working years as an inspector was 8,5 years (range 1-17). Four inspectors used social media (Twitter, Facebook) for private purposes. All used the internet for their work (Google, ZorgkaartNederland, Twitter, news websites).

First research question: Do health care inspectors already use patient experiences on rating sites in their daily supervision of hospitals and in what way?

Seven inspectors used ZorgkaartNederland to gather information in their supervision work. When preparing their annual meeting with the board of a hospital or in case of reports of serious incidents they looked for information on search machines such as Google and then ended up at the patient rating site ZorgkaartNederland.

> *"Then I google that person. You end up at ZorgkaartNederland very quickly. The first hit of Google apparently is ZorgkaartNederland." (Respondent 3)*

> *"In particular I use ZorgkaartNederland, in any case I look at it in preparation for the annual board interview. And, if we focus on a specific doctor involved in a report or for example because of the suspicion of incompetence, then I check ZorgkaartNederland for the individual judgement relating to the doctor." (Respondent 2)*

Three inspectors did not use the patient rating site ZorgkaartNederland. They did, however, gather their information from the internet, but in their cases from hospital websites, newsletters or news websites, not from a source which contains the patient's perspective.

> *"I read newsletters from hospitals. (…) But Twitter is also a possible source. (…) For me that is easy to read, and very handy because I can scan very quickly whether it is valuable for me or not." (Respondent 6)*

Second research question: Do inspectors expect patient experiences in hospitals, reported on rating sites, to contribute to their estimation of risk?

All inspectors who ended up at ZorgkaartNederland indicated that they find it hard to use this information or give weight to this information in their daily supervision.

> *"I think you should be very careful with this information. It must be seen as a signal, not more than that. A signal deserves to be taken seriously and to be properly checked and verified." (Respondent 10)*

"What do you do with it? You take it with you. In that way you use it, but concretely in the conversation with the hospital board, or, in the reports, no, you don't use it that way." (Respondent 1)

Thus, apart from a source for gathering information, the seven inspectors using ZorgkaartNederland did not apply the content of the information for risk identification in their daily supervision practice. However, they saw the reviews as a signal, providing interesting background or contextual information. In the opinion of five inspectors these signals should always be verified and checked by other available information.

"In fact it is an indicator. An indicator always needs further research. It must be seen in combination with other indicators: what are the connections and the relevant themes?" (Respondent 2)

The inspectors brought up three main doubts concerning the weight and value of ZorgkaartNederland as a source for identifying risks.

Firstly, four inspectors feared bias or selectivity, that is they felt that only a small group of people uses rating sites.

"The number of reviews is too small to be taken seriously. Only a small group of patients makes the effort." (Respondent 5)

Inspectors felt that this group is probably not representative of the patient population of a hospital. For example, hospitals might stimulate very satisfied patients to rate their experiences, in order to raise their average rating. Besides, positive reviews may have been posted by family and friends of the doctor.

Secondly, nine inspectors indicated that reviews are often too subjective and emotionally driven. Accordingly, reviews may polarize public opinion at a certain moment and can be used for unnecessarily blaming the doctor.

"I feel the psychology of reviewers on a rating site is interesting. In fact, there is a lot of psychology on those sites. People parrot each other easily and therefore strengthen the message and are thus polarizing what happened at a certain moment. And that gives an incorrect picture of the hospital or doctor. It is influenced too much by the moment and the polarization. We should be aware of that." (Respondent 8)

"It can be used for blaming and shaming. That is very easy on the internet because it is safe and anonymous." (Respondent 9)

Thirdly, inspectors had doubts about the relevance of the content of reviews for the inspectorate's estimation of risk. Negative reviews were thought to contain mostly remarks on the way patients are addressed, the bad food, signage or waiting times, not about potential risks to safety.

"Patients talk on a very basic level, often about how patients are addressed, and that is not within our remit." (Respondent 5)

"I don't know how to interpret the reviews. You know, if a doctor is nice he gets an eight although technically speaking he is not so good. The patient can't interpret that. (…) I feel that's no use for me." (Respondent 6)

If information on ZorgkaartNederland could be integrated into other sources of information on patient safety, most inspectors would consider this information to contribute towards the identification of risks. They indicated that the value of reviews for their supervision would improve if the reviews were supported by facts and were substantial, but also that the tone of the texts matters.

"It depends on whether the review is supported by facts. If it is written in concrete, correct sentences (…) I would rather adopt it than when it is a story of verbal abuse like 'it was really awful' with a lot of emotions." (Respondent 10)

Yet, the inspectors indicated that they would be triggered to act if a review contains medical errors, serious incidents, damage, unacceptable care or, shortcomings of care. Those reviews would be taken more seriously than reviews about how patients are addressed or about complaints. They would also pay attention when the number of negative reviews suddenly rises, because this could be a signal of failing. The inspector should have the feeling that the review was not written impulsively,

"but that another reasonable patient could echo this judgment as well." (Respondent 8)

Selected hospitals and reviews

The hospitals selected had on average 21 negative ratings (see Table 1).

Table 1 *Mean ratings of the hospitals selected and of all the hospitals covered by ZorgkaartNederland (November 1st 2013 – 31st October 2014)*

	Ratings of 10 selected hospitals (mean (range))	Ratings of all (94) hospitals on ZorgkaartNederland (mean (range))
Total number of ratings	129 (65 - 170)	173 (4 - 859)
Mean rating score	8.2 (7.9 – 8.6)	8.5 (7.5 - 9.1)
Positive ratings (score>8.4)	86 (40 – 116)	122 (3 – 598)
Neutral ratings (score 6.5-8.4)	22 (11-33)	36 (1 – 250)
Negative ratings (score<6.5)	21 (12 – 28)	15 (0 – 56)
Percentage >6.4	83.6 (78.5 – 89.7)	91.1 (67.9 – 100)
Percentage <6.5	16.4 (10.3 – 21.5)	8.9 (0 – 32.1)

Third research question: Does presenting, actively, patient reviews reported on the rating site ZorgkaartNederland alert inspectors in their estimation of risks to patient safety?

In total 207 negative reviews were presented to the inspectors, who scored these according to their relevance. The inspectors scored 47 (22.7 per cent) reviews 'relevant' (score 1, 2 or 3) (see Table 2).

The reasons reviews were considered irrelevant

Most of the reviews that were scored as non-relevant for supervision (160 / 207; 77.3 per cent) were labelled as a complaint dealing with how patients were addressed, the attitude of the doctor, information and communication, or waiting times. Inspectors indicated that dealing with such complaints is a task of the hospital itself, that is, the board or a complaint officer or committee.

> *"This is about how the patient is addressed such as bad experiences with being listened to. I reckon that this happens in every hospital and I am convinced that a lot of improvements can be made in this respect, but it is not a task of the health care inspectorate." (Respondent 7)*

Table 2 *The relevance of reviews as scored by the inspectors*

	Negative reviews (N)	Percentage	Percentage of 'relevant' scores
No additional value (0)	160 (in 10 hospitals)	77.3	--
Relevant, information leads to a signal in the file of the organization (1)	31 (in 7 hospitals)	15.0	66.0
Relevant, information leads to further investigations (2)	15 (in 6 hospitals)	7.2	31.9
Relevant, information leads to immediate action (3)	1 (in 1 hospital)	0.5	2.1
Total	**207**	**100**	**100**

Other motives not to score the review as relevant were their vagueness, the shortness of the description or the highly emotional tone such as with comments like:

> *"'He is a horrible man.' That man may well be horrible, but what can the health care inspectorate do about it?" (Respondent 3)*

The reasons reviews were considered relevant

Thirty-one reviews (31/207; 15 per cent) were scored as 'relevant, information leads to a signal in the file of the organization' (score 1). The reasons why inspectors gave this score were:

- the review mentioned risks concerning quality and safety;
- the review had a medical content;
- the review could indicate a structural problem, such as shortcomings in care for vulnerable elderly patients or children, therefore it could contribute to the compilation of a file on that particular hospital or department;
- the doctor was also an instructor to students;
- the department or doctor were well-known, for instance from an earlier investigation, or an underperforming department.

"I know this doctor, he came up more often in conversations. He is also mentioned in an earlier investigation. Although no serious incidents have been reported against him, he is known to be a difficult man to deal with – so to speak!" (Respondent 1)

Fifteen reviews (15/207; 7.2 per cent) were scored as 'relevant, information leads to further investigations' (score 2). The reasons the inspectors gave for considering these reviews to be of greater relevance were medical, procedural or related to the hospital's profile:

- the review mentioned serious incidents or surgical or medical errors, complications or damage to the patient or other major consequences such as a long length of stay;
- or the review concerned medication, it was, for instance, forgotten, or a prescription meant for another patient was given in error during discharge from the hospital;
- the review concerned actual procedural themes in the hospital, for instance deficiencies in procedures concerning the primary treating physician, about cardiac rehabilitation, or about shortcomings with anticoagulants.

If reviews concerned the hospital's profile this might indicate two possibilities. Either the review was about a topic in which the hospital was not specialized;

"This hospital has no department for genetic research, so in that context, if genetic factors play a role, it should be taken care of by specific procedures. And, according to this review there was insufficient attention given to genetic factors." (Respondent 8)

Or the review was related to a topic in which the hospital was specialized.

"This hospital is a bariatric centre. Given that context this should not have happened here." (Respondent 2)

One review (1/207; 0.5 per cent) was indicated as 'relevant, information leads to immediate action' (score 3). The considerations given by the inspector were:

- the review described a serious incident which was also reported to the inspectorate;
- the review concerned an already notorious doctor;
- moreover, the hospital had not reacted properly after this serious incident.

The other general considerations for estimating a greater relevance:
The inspectors mentioned several other considerations for judging reviews to be of greater relevance:

- the number of reviews concerning a specific department, doctor, or topic;
- the concreteness of the review;

"Five operations, two times outpatient operations, five infections; these are concrete facts which make me wonder what kind of operation room was that?" (Respondent 4)

- their own opinion and experiences with how the hospital was functioning;

"I am aware of a serious incident that happened recently in this department, so when I saw this review I was alerted. Then I saw another review about a doctor and again it was this same department. So maybe there is more going on there." (Respondent 3)

- the given period of time and the actual events that took place in the hospital;

"This hospital has had a lot of negative publicity in that specific period. I think that is reflected in the negative reviews" (Respondent 7)

- the ranking of the hospital on other well-known ranking lists;

"Since several years this hospital is on top of a number or ranking lists. However, last year it fell down (…) I think it is interesting to interpret this period, especially where does this organization come from, where are they now and where are they heading for?" (Respondent 2)

- what was already known by the IGZ from other quality indicators;
- the contextual information about the mean scores of all hospitals was considered by most inspectors in their assessment of the reviews as valuable, but never decisive.

"The percentage of negative reviews is high compared to other hospitals, but maybe this hospital challenges patients to offer a rating on ZorgkaartNederland. That fits in with the positive picture I have of this hospital". (Respondent 3)

Did the reviews cover new information, or that which was already known?

The actions of nine inspectors were triggered especially by reviews that confirmed their knowledge about, and experience with, the hospital. In these instances, the reviews on ZorgkaartNederland supported the other sources of information used. Five inspectors explicitly indicated that the reviews rendered new information, mostly concerning a specific doctor or department that was mentioned more than once in the reviews.

> *"For me it resulted in two new points of attention: this doctor, who was mentioned four times and I have never heard of, and also the critical remarks about that specific department I did not know of." (Respondent 5)*

The contribution of the reviews

After having been confronted with the reviews, the inspectors mentioned two ways in which they could use this information from ZorgkaartNederland in future supervisory work. According to nine inspectors, this information could be used to put topics, departments or specific doctors onto the agenda in the yearly interview with a hospital board.

> *"I would mention it as a signal: I saw on ZorgkaartNederland that…Have you seen it as well and what do you think about it? And if so, what have you done about it?" (Respondent 10)*

Three inspectors indicated that this new information could be used in unannounced visits to the hospital, especially referring to specific departments who came to attention through the reviews.

> *"We assess a lot of things, indicators, reports of serious incidents, but if you look for themes in order to make an unannounced visit, this could be part of it, definitely. People make an effort to write a review on ZorgkaartNederland, they do that on purpose." (Respondent 9)*

Discussion

We examined whether patient experiences as reported on patient rating sites have a potential to contribute to hospital inspectors identification of risks to safety. Currently, most inspectors only use patient experiences on the patient rating site ZorgkaartNederland as a source for gathering background or contextual information about a hospital or a doctor. It automatically arises with searching the internet. However, for most the question remains: What exactly to do with the ratings and reviews, and how to determine the value of the picture they get? This could be caused by three main objections brought up by the inspectors at the beginning of this study. Firstly, inspectors worry about how representative the patient rating sites are, given, for instance, the selected group of patients responding and the relatively low number of ratings. Secondly, they indicate that reviews are often too subjective and emotionally driven. Thirdly, they had doubts about the relevance of the content of these reviews for supervision.
Earlier research showed, too, another objection among inspectors to the use of patient rating sites for supervision. This was their concern about whether patients are able to evaluate the medical expertise and capabilities of an individual doctor [28, 41].

Concerning how far rating sites are representative, it is known from literature that users of patient rating sites significantly differ from non-users on socio-demographic and psychographic variables and health status. Users are significantly younger and more highly educated. Also female patients and patients with chronic diseases use patient rating sites more often than other patient groups [16, 42].
However, research on the data provided by ZorgkaartNederland [37] showed that the self-selected sample of patients on ZorgkaartNederland did, in fact, lead to representative ratings about Dutch health care in hospitals. Moreover, research into the content of reviews showed that the review process is not just a one-off reflection of a single moment, but contextualizes this within a series of previous experiences [41]. This may place the prevalent 'n=1' objection in perspective.
The subjectivity of patient's assessment is a well-known discussion in literature. Indeed, a patient's assessment of care is subjective, by nature. Nevertheless a lot of research has been done, showing positive relationships between patient's (subjective) assessments and the quality of care, patient safety and clinical effectiveness [43-49].
Although there is evidence of the correlation between scores on patient rating sites and quality indicators and clinical outcomes on a hospital level [5, 7, 18-20], little research has been carried out on the association between patient ratings and physician quality metrics. Gao and colleagues found a significant positive relationship between online ratings and physician quality as shown by board certification, education and malpractice claims [7]. However, more research on this topic is needed to overcome this objection.
When confronted with the text of negative reviews from one of the hospitals under

their supervision, 23 per cent of the reviews were scored as relevant for risk estimation by the inspectors. Reviews were indicated as relevant when they contained information about major safety problems such as medication errors, serious incidents, severe damage or consequences for the patient, structural organizational problems such as a mal-functioning department or doctor, actual themes and whether the reviews are in line with the hospital's profile. Many of these 'medical' indicators of possible relevance were also mentioned by inspectors at the beginning of the study, before having scored the reviews presented. However, the scoring of the reviews revealed new relevant indicators such as structural and procedural organizational problems which could produce a relevant score for risk estimation.

Compared to research carried out on reviews concerning long term elderly care [25], the percentage of reviews considered relevant by hospital inspectors was lower (23 per cent vs. 62 per cent). However, from the relevant hospital reviews, 34 per cent is seen as 'relevant, information leads to further investigations' (score 2) or even 'relevant, information leads to immediate action' (score 3), compared to 15 per cent in the elderly care. Safety issues in hospitals might be judged serious at an earlier stage than in long term care given the high-risk processes involved. The high number of reviews judged to identify safety issues is in line with patient safety literature, which states that there is evidence to suggest that hospital patients can be used as partners in identifying poor and unsafe practice and help enhance effectiveness and safety [44, 50]. Although most comments are classified as physician-related concerns [4, 13], content analyses of reviews in literature showed three dominant themes indicated by patients: interpersonal manner, technical competence and system issues. These all include potential risks to patient safety [13]. It is important to note that the use of rating sites is likely to increase in the near future when the generation socialized with social media reaches the age in which health questions and doctors become dominant. As a result these kinds of sources might become even more relevant [3, 4, 11, 42] for patients and physicians, as well as for stakeholders such as the health care inspectorate.

Implications

Hospital inspectors at first showed some restraint in their concrete use of ZorgkaartNederland in their daily supervision. However, after being confronted with the reviews and scoring of the negative reviews of one of the hospitals under their supervision, most inspectors were cautiously positive about the contribution of the reviews to their risk identification. It therefore appears to be worthwhile to provide health care inspectors regularly with a summary of negative reviews on carefully-edited rating sites such as ZorgkaartNederland, complemented with contextual information, regarding hospitals under their supervision.

Almost all inspectors indicated that specific themes, departments or doctors on ZorgkaartNederland could be presented in their annual interview with the hospital board. Also specific departments which showed up negatively in the reviews could be subjected to unannounced visits.

Another positive aspect of using ratings and reviews in supervision is the availability of actual information, in addition to the yearly available conventional quality indicators. Thus, a more efficient way of risk-based prioritizing within a huge number of health care organizations is a possibility [25]. This is especially important in health care sectors with a substantial number of organizations or professionals such as the elderly care sector, general practitioners, dentists and pharmacists. In this way, patient ratings and reviews can become a structural part of the supervisory framework for risk detection.

Strength and limitations

This study has strengths and also limitations. The fact that the patient rating site ZorgkaartNederland is an independent, non-commercial website, with its own editorial office which judges the reviews one-by-one on their substantiating text, and checks on the sender of the rating, is a strength of this patient rating site. It increases the value of the reviews. This is not necessarily the case with all patient rating sites in other countries.

The hospitals selected were not necessarily representative of hospitals on ZorgkaartNederland. However, the focus of our research was on the identification of risks in the texts of the negative reviews. Therefore, we wanted a substantial number of negative reviews per hospital and put the minimum threshold on ten. In that way it was possible to identify trends, themes, departments or doctors that were, for instance, mentioned more than once.

In this research design, we selected, for each inspector, a hospital for which he or she was responsible. In fact, most inspectors have known these hospitals for some time. They therefore assess the reviews according to their own point of reference, consisting of their accumulated knowledge and experiences. This can be a support to information already known by the inspectors, for instance about a dys-functional department. However, this could also blind the inspector to new insights or safety aspects. It would be worthwhile to investigate, in a future study, whether an inspector unacquainted with a certain hospital, would come to the same or a different selection of relevant reviews.

Conclusions

Patient rating sites can contribute to the risk-based supervision of hospital care of a health care inspectorate. It is seen by most inspectors as an additional source of information from the patient's perspective to detect poor quality of care. However, it should always be accompanied and verified by other quality and safety indicators.

Acknowledgements

The authors thank the NPCF for fully access to the data of ZorgkaartNederland.

Author's contributions

Concept and design (SK, IB, TK, LZ, JH), collection of the data and literature (SK), analysis and interpretation of the data (SK, IB), drafting of the manuscript (SK, IB, TK, LZ, JH), critical revision of the manuscript (IB, TK, LZ, JH), supervision (TK, JH). All authors read and approved the final manuscript.

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Summary and general discussion

Introduction

According to the Institute of Medicine, health care should be safe, effective, patient-centred, timely, efficient and equitable [1]. An important way to measure quality of health care is to evaluate it from the patient's perspective [2]. Patients can offer a unique contribution to the evaluation of health care. Some evidence suggests that the patient's perspective on the quality of care is associated with other measures of quality, such as patient safety aspects and clinical effectiveness [3-13]. Moreover, there is some evidence that patients can detect risks to patient safety [14-23].

There are several methods for measuring the patient's perspective on the quality of hospital care. This thesis focusses on the use of both patient satisfaction and patient reviews placed on rating sites.

At the same time, using the patient's perspective for judging the quality of care has been met with considerable resistance [9, 24]. Patient satisfaction is seen as a cognitive evaluation of and an emotional reaction to the care provided [24], and defined in terms of the patient's evaluations of what happened during their care, compared to what patients expect to receive from health care. This holistic, multidimensional concept of patient satisfaction leads to a lot of discussions. The first point of criticism is that it is difficult to measure. Patient satisfaction is affected by many different factors, including: an individual's expectations; their needs and desires; prior satisfaction; predisposition and use of health care; health status and outcome. Therefore, it differs among individuals and would be a complex concept to cover comprehensively [25-27]. A second criticism concerns the subjectivity of satisfaction. Because personal components are an important part of satisfaction, patient satisfaction scores are of less use for measuring improvements in quality [25-30]. A third criticism of patient satisfaction is that satisfaction scores are often positively skewed, and therefore undifferentiated [30-32]. Finally, patient satisfaction scores are thought to be unusable for discriminating between hospitals because they rarely address the outcomes and effectiveness of treatment [30, 33, 34], and because most of the variations in performance are due to differences in patients rather than differences in doctors [35].

In recent years, patient rating sites, offering a new approach towards hearing the patient's perspective on quality and safety in health care are rapidly gaining attention. Patient rating sites are specialized internet rating sites, allowing patients to express and rate their satisfaction and experiences with health care. These public patient rating sites can be used by other patients looking for care, by hospitals looking for areas to improve their care, and by other stakeholders such as the health care inspectorate, in order to monitor the patient's assessments of care. Moreover, they are increasingly used to detect risks to the quality of care or safety aspects. Research yielded evidence that patients can identify medical errors, adverse events or predict malpractice risks [15, 19, 22, 23]. However, the use of patient rating sites for evaluating the quality of care also raises some objections, such as questions about their representativeness, their supposed vulnerability to manipulation and the impossibility adjusting the results for case mix.

The overall theme of this thesis is to contribute to the knowledge of how to use the patient's perspective for monitoring the quality of care, as measured in patient satisfaction research or patient rating sites. In doing so it will consider the discussions about the patient's perspective in gaining insight into the quality of care. This chapter provides a summary of the research issues involved followed by the main conclusions of the research itself. A number of comments relating to the conceptual and methodological aspects are then offered, followed by an examination of the implications of the research findings for policy together with an agenda for future research.

Summary and the main conclusions

Part I The development and validation of patient satisfaction questionnaires

Chapter 2 describes the development and validation of a short, core instrument to screen patient satisfaction in the eight university hospitals in the Netherlands in order to compare their scores and use them for improving care. This 'Core Questionnaire for the Assessment of Patient Satisfaction in Academic Hospitals' (COPS) was based on the needs of both inpatients and outpatients. By developing the COPS, the university hospitals could be transparent about their patient's judgements. The COPS is shown to be a reliable and feasible instrument for measuring the satisfaction of university hospital patients. It allows a comparison between different hospitals, and gives benchmark information both on a hospital, as well as a department level. Used together with previous measurements, it can help to make improvements. The COPS was used by all Dutch university hospitals from 2003 until 2009, during which time it was also adopted by almost all general hospitals in the Netherlands.

The following years, witnessed a trend towards day care being substituted more frequently for clinical care. OECD figures showed that in seven European countries and Australia there was a 121 per cent increase in day care surgical procedures in the period from 2000 to 2007 [36]. Day care admissions have advantages from the patient's perspective, such as the prevention of hospitalization, a decrease in waiting times and a more rapid recovery at home. Also, the replacement of clinical care by day care showed good clinical outcomes for different specialties [37-43].
The increase in the number of day care admissions makes it necessary to understand the experiences of this patient group. Therefore, an instrument was developed focussing on the day care processes, and, based on the existing COPS for clinical patients. In **Chapter 3**, the development and validation of this COPS-D is described, were D standing for day care. For this particular COPS, two extra aspects were added: *pre-admission visit* and *operation room*. The COPS-D appeared to be a valid and reliable questionnaire for assessing day care satisfaction. It completes the model for measuring the patient satisfaction of the common types of care given in hospitals. Hereby, it fulfils the conditions formulated in advance while developing the clinical and outpatient COPS. These are that it is a short, core instrument to screen patient satisfaction in order to make comparisons between hospitals as a base for improving hospital care.

Part II A comparison of patient satisfaction scores between hospitals and over time
Patient satisfaction scores are often used for benchmarking hospitals with each other, in order to compare performance. For instance in order to identify best practices that can be used as an example for quality improvements. However, hospitals differ in the way they organize care and in their patient population. Therefore, it is necessary to examine the case mix factors in order to make adjustments so that hospitals can be accurately compared with each other. In **Chapter 4**, we performed a study to determine whether differences in patient satisfaction can be attributed to hospital, department or patient characteristics. Secondly, we investigated which case mix variables should be taken into account when patient satisfaction questionnaires such as the COPS are used for benchmarking purposes. Our study showed that patient characteristics explain the major part of patient satisfaction, whereas there is only minor variance on the hospital and the department levels. When the aim is benchmarking between or within hospitals case mix adjustment factors should be the patient characteristics of age, education and health status. This is important because benchmark projects with case mix corrections can provide a more valid comparison and therefore help health organizations to make a well-informed choice about how to improve the quality of care [44].
The patient's perspective is frequently used as an indicator to judge the quality of hospital care, together with outcomes considered to be more objective, such as the length of stay (LOS) in the hospital. Good quality of care might lead to a shorter LOS, and might also lead to more satisfied patients. Therefore, in **Chapter 5**, we performed a study to investigate the correlation between the LOS and patient satisfaction as measured by the COPS. The LOS and patient satisfaction scores of seven medical specialties on a hospital ward level were correlated. We found in six out of seven specialties there was no evidence that hospital wards with a relatively short mean LOS provided a higher, or lower, degree of patient satisfaction than wards with a relatively high mean LOS. The only exception was pulmonology where significantly higher satisfaction scores were found for specific items on wards with a shorter LOS. These specific items included: the reception on the ward; the information provided by nurses on admission; the expertise of the nursing staff; the way information was transferred from one person to another; and respect for the patient's privacy such as in conversations and during physical examinations.
The fact that we found no correlations in six out of seven specialties could well be explained by the fact that the LOS is related to other dimensions of care, for instance, efficiency or effectivity, while patient satisfaction is more related to patient-centred care or processes. We, therefore, suggest, in future research, that questions about how long patients stayed in hospital and how they experienced their LOS should be addressed directly.
When hospitals use their results of patient satisfaction research corrected for case mix in order to make improvements in the quality of care, then it is necessary to monitor their patient satisfaction over time. This is because it often takes several years to achieve improvements [45, 46]. However, not all hospitals monitor and analyze changes in patient satisfaction over time in a structural manner [45, 47, 48]. Therefore, they might miss information from the patient's perspective regarding the effectiveness of their improvements in the quality of care. Moreover, patient satisfaction scores tend to be skewed towards the positive end and so are considered to be difficult to improve upon [26, 49-52]. In addition, the greatest improvements in patient satisfaction scores often take place in departments which originally scored the lowest [48, 53]. In **Chapter 6**, we performed a trend analysis of patient satisfaction scores in the eight Dutch university hospitals. We focussed here on trends, effect size and its consequences for improving patient-centred care. The scores were tailored to the department level and provided to hospitals with

qualitative comments on how to improve care. Here, we found that there were significant positive trends in patient satisfaction scores on a national and on a hospital level, in both inpatient and outpatient departments. The effect size we observed, however, is rather small. We used intentionally skewed answering categories in order to limit the ceiling effect of the questionnaire. This appears to have worked. We found a substantial number of scores increasing over time, even when controlled for a possible ceiling effect, and even in hospitals with an initial high score. Indeed, the greatest change was, by definition, not found in hospitals with a low initial score. Therefore, we conclude that monitoring patient satisfaction scores over time may give valuable information on the effectiveness of quality improvement programmes, provided that they are accompanied by external and organizational circumstances that might have had an influence on these scores. Secondly, patient satisfaction scores can be presented on a more detailed level, for instance to the subgroup of unsatisfied patients. These patients might indicate risks to the quality or safety aspects of hospital care. Therefore, tailoring quality interventions to this subgroup can lead to improved patient-centred care for all patients. Finally, high scores which gradually decline over time could indicate a stagnation of the improvements in the quality of care. Therefore, monitoring patient satisfaction scores over a period of time, for instance by other stakeholders such as the health care inspectorate, could be a useful indicator of the quality of care.

Part III Patient rating sites as a new development in monitoring the quality of care
In **Chapter 7**, we described a study addressing whether and how reviews on a patient rating site have the potential to identify risks in patient safety to hospital care and could, therefore, contribute to the daily supervision of health care inspectors. We performed a mixed method study, conducting individual interviews to explore the use and views of inspectors about how far one can use patient rating sites. Furthermore, we presented to inspectors negative reviews from the Dutch patient rating site ZorgkaartNederland and asked the inspectors to score the relevance of the reviews in terms of information on the risks to patient safety. Finally, we conducted a second interview to explore which elements in the reviews triggered inspector's concerns and rendered information on risks to patient safety. The hospital inspectors scored 23 per cent of the reviews as relevant to the estimation of risk. Reviews were indicated as relevant when they contained information about major safety problems such as medication errors, serious incidents, severe damage or consequences for the patient. They were also considered to be relevant when containing information about structural organizational problems such as a mal functioning department or doctor, actual themes that were important at that time in the hospital, and whether reviews were in line with the hospital's profile. Most inspectors were cautiously positive about the contribution of the reviews to their identification of risk. They were seen as an additional source of information to detect poor quality of care. However, according to the inspectors, they should always be accompanied and verified by other quality and safety indicators.

General discussion

Our studies showed that valid and reliable patient satisfaction questionnaires can indeed be used to assess or monitor the quality and safety of care from the patient's perspective. When used for improvements in the quality of care, reliable comparisons of patient satisfaction scores between, and within, hospitals and over time, can be made. However, they should be corrected for case mix with regards to age, education and health status. They should also contain qualitative patient comments and be tailored either to a lower level than the hospital, such as a department or specialty, or to specific subgroups such as unsatisfied patients. A direct correlation between patient satisfaction scores and an organizational indicator such as the length of stay in hospital could not be found in our study. Finally, the patient's perspective as presented by reviews on patient rating sites can contribute to the detection of risks to patient safety, and can therefore be used by hospital inspectors as an additional indicator to identify poor quality of care. These main findings will now be discussed based on conceptual and methodological considerations.

Conceptual considerations

As stated before, four main conceptual objections arose up when using patient satisfaction for measuring the quality of care from the patient's perspective. These are: the multidimensional concept and difficulties in how to measure it; its subjectivity; the degree to which satisfaction scores are skewed; and the supposed lack of discriminative power.

The multidimensional concept and the difficulties in how to measure it
Our studies showed that with regard to the aspect of the multidimensional concept of patient satisfaction, valid and reliable questionnaires measuring patient satisfaction can indeed be used to assess the quality of care. However, one aspect still remains underexposed in our research, namely the dimension of patient expectations. The fulfilment of expectations is said to be the most

important predictor of overall satisfaction [54]. It is the result of the patient's prior expectations versus their current experiences with the hospital. Prior expectations can only be partly controlled by health care providers, and hence hospital experiences of the equal quality of care may be rated differently due to differences in prior expectations [54]. What matters most to patients in meeting their prior expectations concerns the emotional and human features of the encounter, such as effective communication, adequate information, and clinical outcomes [55]. This is in line with a study showing the most important expectations of GP patients, that is that the doctor shows an interest and listens, explains the problem and answers doubts, and gives a medical diagnosis [56]. Only a small proportion of patient satisfaction research includes patient expectations [26]. Also, in developing the COPS and COPS-D, the patients involved were asked only what they considered the most relevant items to them, not what their expectations were and whether they were met or not. However, the COPS was designed to be a short, reliable and valid core questionnaire to screen patient satisfaction and compare the satisfaction between hospitals. Based on these results, hospitals were supposed to do further research on departments with low satisfaction scores. This could involve patient's prior expectations, and lead to improvements in quality on a departmental level. Although research showed that 90 per cent of the clinicians state that asking patients about their expectations is very important, only 16 per cent reported actually asking [57]. Hence, it is essential that hospitals take a more active role in training clinicians to address patient expectations and initiate programmes to improve the quality of care. Such steps would also include managing patient expectations [57]. This could improve the quality of patient-centred care and hereby patient satisfaction. Yet, there is still no consensus how to put the management of patient expectations into operation or even how to measure them [54, 58]. Furthermore, methods to manage patient expectations need to be researched [55, 57, 59]. These discussions support the use of patient experience questionnaires, which are supposed to be influenced less by subjective expectations than satisfaction surveys [35].

Subjectivity

Patient satisfaction is by nature subjective. Our research shows that despite being subjective, patient satisfaction questionnaires can be valid, reliable, and of use for improving the quality of care. We also showed that the reviews on a patient rating site contain relevant information about aspects of quality and safety in hospital care, which are suitable for health inspectors in their daily supervision. So, despite the patient's, possibly subjective, assessments of care, patients can be used as partners in identifying poor and unsafe practice, and hence help to enhance clinical effectiveness and safety [4, 60]. Moreover, information gained from patients regarding events related to safety, and perceptions of safety, supplement other methods of monitoring safety and identifying risk. Research showed that 45 per cent of the adverse events raised by patients were not documented in the medical records, nor recorded in the critical incident system [19, 22]. Therefore, the subjectivity of the patient's perspective is clearly of added value in addition to clinical perspectives.

Skewness of scores

Our studies show that with regard to the objection to highly positive patient satisfaction scores, high scores still do not mean that there is no room for improvement. The answering categories of the COPS were intentionally skewed, and this made improvements still possible. In patient satisfaction research the focus should be on maintaining these high scores, while reducing the variation in responses [50]. Furthermore, high patient satisfaction scores do not necessarily mean that care received is always excellent [61]. They might even mask negative experiences [62, 63]. When, for instance, 85 per cent of the patients are satisfied, the hospital might ignore the 15 per cent who showed less satisfaction. The focus should, therefore, be on identifying low scoring subgroups of patients, tailoring improvements in the quality of care to their comments, and thereby improving the satisfaction for all patients.

Discrimination between providers

The discriminative power of a patient survey should meet the following two criteria. The instrument must detect significant and meaningful differences between health care providers and the sample sizes required for reliable estimates on the provider level are available [64]. Indeed, patient satisfaction scores have their limitations in discriminating between good and bad practice. After all, variation is caused mainly on a patient level. In fact, most other instruments measuring the patient's perspective, such as the Consumer Quality Index, have the same limitations [64, 65]. This restriction should be taken into account when interpreting results from the patient's perspective. However, our research showed that, indeed, best practices can be esthablished on the hospital and department level. This indicates that discriminating between hospitals is possible with research into patient satisfaction, provided that the sample sizes are large enough, and the patient characteristics such as age, education and health status are taken into account when benchmarking organizations.

Other methods of measuring the quality of care from the patient's perspective

These conceptual objections, the multidimensional concept of patient satisfaction, its subjectivity, the positive scoring and the supposed lack of discriminative power, have led to the development and widespread use of other instruments in recent years.

Patient experiences

- Over the last decade there has been a shift from measuring patient satisfaction towards measuring patient experiences. The Picker Institute originally developed patient experience questionnaires for the NHS in the United Kingdom [66]. Other examples of a patient experience questionnaire include the CAHPS (Consumer Assessment of Health care Providers and Systems) [67]. Instead of asking whether patients are satisfied, patients are asked specific questions about their experience of the delivery of care. They are asked whether certain processes or events actually occurred during the course of a specific episode of care [66]. This is based on the assumption that the experiences reported should be influenced less by subjective expectations than satisfaction [35]. The questionnaires address issues that are of concern to patients and are built upon qualitative in-depth interviews with patients and focus groups, as is the case with the COPS. If the purpose is to monitor the performance of hospitals or departments and point out areas that could be improved, then this way of questioning patients could be of more worth than an overall satisfaction score [28, 66]. Collecting detailed reports of what actually happened to patients during their hospital stay can be used for continuous improvements in the quality of hospital care. Another purpose of assessing patient experiences is the external accountability of the health care providers to other stakeholders. For example, such assessments could assist health insurers in purchasing health care, or patients in choosing a provider [28, 68]. However, these questionnaires and methods need to be standardized in order to attain the goal of a fair comparison.

This has led to the development in the Netherlands of a series of Consumer Quality Indexes (CQ-I), for different care sectors and specialties, which have been used frequently since 2006. A lot of research is being carried out into how far the CQ-Is are valid and of use. As is the case with the COPS, most variance among patient experiences of inpatient hospital care is explained on the level of the patient, not on the department's or hospital's level [65]. When used for quality improvements, the results should ideally be applied in detail to the department level [65]. Some critical comments were made about their limited usability for quality improvements, for instance the complex way of presenting results or concerning improvements to be made beyond the reach of the hospital staff. Furthermore, the experience surveys were criticized for their limited attention towards the perceived outcome, and the length of their questionnaires [68, 69]. These comments are in line with the objections raised against the use of patient satisfaction questionnaires. However, the COPS was already developed as a short, core, questionnaire consisting of 16 questions to screen patient satisfaction on the most important aspects for patients. The COPS is meant to be the starting point for further, qualitative research on how to improve these aspects. One idea would be to continue for instance with focus groups with patients, as could be the case when using CQ-Is for quality improvements [70].

The objections encouraged the development of shorter questionnaires to assess patient experiences in the Netherlands, the Patient Reported Experience Measures (PREMs). Moreover, it has led to the abolition of the mandatory use of the CQ-I in the care sector in 2016 [71]. The objections also supported the use of Patient Reported Outcome Measures (PROMs), to provide complementary information about the outcomes of care. In this way other quality domains such as clinical effectiveness and safety are also covered [72]. PROMS are patient's self-reported health status and can be used for several purposes, including monitoring clinical practice, outcome measures for clinical trials and as an indicator of the quality of care. Within this last purpose, several sub-purposes are possible, including public information for patients, information for supervision or information for health care insurers about purchasing. Research found weak positive relationships between the patient's experiences and PROMS. The domain of communication with, and trust in, the doctor is being most strongly associated with safety and effectiviness [72].

Global rating of satisfaction

- The patient's overall assessment of th quality of health care is often reported as a global rating (scale 0-10). This is a summary score indicating patient satisfaction. It is often used as summary information regarding the quality of care and presented in public communications. In our studies with the COPS, the university hospitals decided not to include this overall assessment score, because this score was too global to use for comparisons. However, general hospitals adopting the COPS for their satisfaction research added this global score in order to present it in their public communications. Research into which

aspect of care - structure, process or outcome - contributed most to the overall quality showed that process aspects explained by far the most variance in the global rating. This was followed by structural aspects and, to a lesser degree, outcome aspects [73]. Process-related aspects were the doctor-patient communication and information, structure-related aspects were waiting times and the continuity of care, and outcome-related aspects were improvements in, or worsening of, symptoms. This applies to all patient groups and is congruent with previous research [74-76]. Furthermore, research by Jenkinson [30] showed that this global score on a 5-point rating scale indicating 'overall patient satisfaction' was determined by physical comfort, emotional support and respect for the patient's preferences. However, Krol found that such a global rating is less valid than an overall rating score based on the summary score of the quality indicators in a patient experience questionnaire [77]. This global satisfaction score is largely associated with the willingness to recommend the hospital to others, which is another one question-score, which is widely used [78].

Net Promotor Score

- The Net Promotor Score (NPS) was introduced by Reichheld in 2003, and is used in several commercial companies [79]. The NPS is a single metric (scale 0-10) that quantifies the response to a single direct survey question: How likely are you to recommend this service? In the UK a variation of the NPS, 'the Friends and Family Test' (FFT), is widely used. Hereby patients are asked whether they would recommend an intervention or service to a loved one. As with the NPS, three categories of responders are identified: promoters (those who would definitely recommend the service and use it again, score 9 and 10); passives (those who are broadly happy, but would not actively promote the service, score 7 and 8); and detractors (who actively discourage others to experience the service, score 0 to 6). The overall NPS is simply calculated from the percentage of promoters minus the percentage of detractors. Whereas highly satisfied customers (promoters) are likely to tell others and bring new referrals, dissatisfied customers (detractors) may do the opposite [80]. The FFT can be used to compare the performance of hospitals and departments, highlight problems, trigger improvements in services, provide patients with understandable information in order to make choices and give information much faster than with traditional patient surveys [81, 82]. Opponents argue that the FFT is not validated, has inadequate methodological consistency and can be inappropriate for some patients [81]. Although research found a strong correlation between the overall global satisfaction rating and the recommendation question or loyalty, these concepts are not the same [77, 78, 82-84]. Different attributes contribute to the overall assessment and the recommendation [82, 84]. Moreover, a willingness to recommend may be an objective, active judgement, while satisfaction is an affective, passive response [84]. Associations with other measures of hospital quality are mild to moderate, indicating that caution is needed when using the FFT as a comparative measure of hospital performance [81]. Also, the FFT reflected poorly the scores of the quality indicators on patient experiences, making it seemingly less valid as a summary of patient experiences than a global rating or, especially, an overall score [77]. Finally, prior studies used for developing the COPS showed that a 5-step response-scale appeared to be the optimal format, compared to a 10-step evaluation scale [85].

Methodological considerations

Each chapter in this thesis highlighted methodological issues concerning the studies performed. Here, some general remarks are addressed concerning research on the quality of care from the patient's perspective.

Non-response analyses

All studies performed with the COPS and COPS-D dealt with the fact that we could not perform non-responders analyses, due to the anonymity of the studies. In fact, very satisfied or dissatisfied patients particularly may have responded. Fortunately, our response rates were still quite reasonable [86, 87]. Former research showed that the impact of non-responder bias on the patient satisfaction questionnaires of hospitalized patients is rather small [51, 88]. Moreover, in our study in Chapter 5, we showed that the effect of the response rate as a hospital variable was not robust and only significant in the dimensions of nursing care, aftercare and overall satisfaction.

Improvements in quality

The underlying goal of all our studies was to provide aspects, indicated by patients, to improve the quality and safety of care. However, in none of our studies we did perform an analysis on the relationship between improvements in quality raised by the questionnaires or the rating site, and those made by the hospitals. Studies on the effectiveness of efforts to improve quality were not part of our research designs. However, for future research, we suggest investigating to what extent patient satisfaction increases after implementing improvements in quality made on the basis of results from former research.

The implications for practice and future research

The following remarks should be taken into account when using the patient's perspective as an outcome measure to monitor the quality of hospital care.

The patient's perspective used for improvements in quality

We have showed that, in order to improve the quality of hospital care, research by questionnaires such as the COPS could be used as starting point to screen patient satisfaction and indicate areas for improvement. Subsequently, follow-up studies could be used to perform improvement activities. The results of research into the patient's perspective should preferably be presented on a low organizational level – that is from departments, doctors, and dissatisfied patients. Furthermore, by conducting an analysis on the question level instead of on the mean aspect or overall scores, this offers more useful results for indicating improvements. Also presenting the percentages of given answers in addition to only mean scores could be worthwhile. And, in addition, the quantitative research should be completed by text comments. Qualitative research on text comments showed that, even when giving a high satisfaction rate, patients are still able to detect areas for local improvements [61]. When benchmarking, hospitals, departments or specialities, or in time, the samples size should be large enough, and results should be corrected for case mix regarding age, education and health status. Finally, tailoring results and comments to different patient groups helps to understand the types of problems faced by these groups and to make adequate improvements [60, 89]. Research showed that dissatisfied patients indicated far more areas for improvement than satisfied patients [60]. Future research should preferably focus on the effects of these specific improvements in quality based on the tailored results of research into the patient's perspective.

The patient's perspective for risk detection in patient safety

Hearing the patient's voice is becoming increasingly important in health care supervision. In Chapter 7, we found that patients can, indeed, detect risks to patient safety, as indicated in reviews on a patient rating site, which can contribute to the daily supervision of hospital care by the health care inspectorate. This is in line with qualitative research addressing the text comments of dissatisfied patients who expressed a large number of safety issues in their text comments [60]. However, when exploring the views of inspectors about this patient's perspective, we found initially that inspectors agree with the importance of the patient's input, though, with some restrictions. They felt that the patient's remarks should not be too subjective, nor too emotional, nor contain too much information about the way patients were addressed by the doctor. In short, the contribution of patients should preferably in a sense be 'clinical', and somewhat removed from subjectivity. This is remarkable, since the subjectivity is obviously the prime value of looking at the patient's perspective. An explanation could be that inspectors are focused on safety aspects, that they are used to work with clinical quality and safety indicators and objective facts. By contrast, the subjectivity of care assessments and the way patients are addressed by the doctor means that inspectors, often, do not regard this as part of their remit – one that is defined by objective indicators. However, when confronted with the negative reviews, they became more positive about the contribution of the patients concerning specific safety aspects of hospital care. Still, they insisted that the patient's voice should always be accompanied and verified by clinical indicators. This caution of inspectors for the subjective value of patient reviews is a point of concern for supervision policy in the near future. It takes more research to understand and support the value of the patient's perspective on quality and safety, for instance by comparing the patient's perspective with clinical outcome indicators or with supervision judgements. Probably, it takes more time to incorporate the patient's voice structurally into supervision. However, a promising start has been made.

The patient's perspective in transparency in the quality of care

In recent years transparency in the quality of care has been promoted by the Dutch government [68]. Transparency of quality of care is defined as the availability and comparability of information about the quality of health care providers [68], for instance from the patient's perspective. It is seen as an important way to stimulate or secure the quality of care. In the Dutch health care system, four actors have an interest in transparency: patients in order to make a choice of provider; providers in order to initiate improvements to quality and for external accountability; health insurance companies, in order to help them to purchase care based on quality; and government, for supervision and sustainability. A review of five years of actively using results of CQ-Is showed that health insurance companies, in particular, have tried to use these results in their purchasing of care [69]. A minority of the patients used public information for choosing a provider, and although health care organizations embrace the opportunities to hear the patient's perspective for improvements in quality, they exhibited restraint and a defensive attitude with regard to using the patient's perspective in external accountability [68]. However, public reporting of the quality of care stimulates improvements in quality [90] especially for low scoring providers [53].

The growing use of online patient rating sites with their public reporting of quality may lead to an increasing use of the patient's perspective on rating sites by these four actors. More and more patients judge their providers on rating sites and an increasing number may even choose their provider based on the reviews of others. Moreover, it may motivate providers even more to make improvements to quality especially when they are poorly rated, or when health insurance companies select preferred providers in their purchase of care. A Dutch health insurance company recently contracted the first hospital based on this notion of 'value based health care'. Here, quality from, among others, the patient's perspective, is leading in purchasing care [91]. However, it is then necessary to assess the reliability and validity of public resources, such as patient rating sites, on a regular basis. Another concern is the impossibility of case mix correction for patient characteristics, as rating sites consist of the anonymous reactions of patients. Future research should focus on these aspects, as they are important for all actors in promoting transparency about the quality of care from the patient's perspective.

Conclusion

Patient satisfaction research performed by COPS-questionnaires provides a valid and reliable method to give insight into the patient's perspective on the quality and safety of care. They have turned out to be helpful in evaluating and monitoring hospital care and contribute to improving its quality. This is inspite of the critical comments concerning the concept and the methodological considerations when addressing patient satisfaction. Patient rating sites offer new opportunities for hospitals and health care inspectorates to use the patient's perspective in improving and monitoring the quality and safety of hospital care.

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Appendices

Nederlandse samenvatting

COPS-questionnaires

Dankwoord

List of publications

Portfolio

Curriculum Vitae

Nederlandse samenvatting

Introductie

Het doel van dit proefschrift is bij te dragen aan de kennis over het gebruik van het patiëntenperspectief bij het monitoren van kwaliteit van ziekenhuiszorg. Kwaliteit van zorg vanuit het patiëntenperspectief wordt in dit proefschrift gemeten met patiënttevredenheidsvragenlijsten en een patiëntwaarderingswebsite.

Kwalitatief goede gezondheidszorg is veilig, effectief, patiëntgericht, tijdig, efficiënt en toegankelijk. Een belangrijke manier om kwaliteit van zorg te beoordelen is evaluatie vanuit het perspectief van de patiënt. Patiënten bieden, vanuit hun gezichtpunt, een unieke bijdrage aan evaluatie van zorg. Uit onderzoek blijkt dat er een relatie bestaat tussen kwaliteit van zorg vanuit het perspectief van de patiënt en andere kwaliteitsmaten, zoals patiëntveiligheid en klinische effectiviteit van zorg. Bovendien wijst onderzoek uit dat patiënten in staat zijn risico's in patiëntveiligheid aan te geven.

Tegelijkertijd is er veel weerstand tegen het gebruik van het patiëntenperspectief om kwaliteit van zorg te beoordelen. Zo wordt patiënttevredenheid gezien als een cognitieve evaluatie van en een emotionele evaluatie op de gegeven zorg. In die emotie spelen individuele verwachtingen van de zorg een belangrijke rol. Ook allerlei patiëntkenmerken zoals persoonlijkheid, leeftijd, opleiding en gezondheidstoestand spelen hierin mee. Tevredenheid is dus een concept met verschillende dimensies, en is daardoor moeilijk te meten. Bovendien kan het per persoon verschillen. Een tweede bezwaar is de subjectiviteit van het patiëntenperspectief. Daardoor zou het minder bruikbaar zijn voor kwaliteitsverbeteringen. Ten derde zijn tevredenheid-scores vaak erg hoog; patiënten zijn in het algemeen erg tevreden over de zorg die zij krijgen. Dat maakt dat er weinig verschillen zijn tussen ziekenhuizen en weinig mogelijkheden tot verbetering. Dit hangt samen met het vierde bezwaar: patiënt-tevredenheidsvragenlijsten zouden slecht in staat zijn om verschillen in kwaliteit van zorg tussen ziekenhuizen of afdelingen aan te tonen.

De laatste jaren zijn patiëntwaarderingswebsites sterk in opkomst. Dit zijn websites waarop patiënten anoniem hun ziekenhuis of zorgverlener waarderen met een cijfer tussen de 1 en 10, en deze waardering onderbouwen met tekst. Het doel van deze websites is om andere patiënten te helpen bij het maken van een keuze voor een dokter of ziekenhuis. Daarnaast hopen deze websites ziekenhuizen verbeterpunten in de zorg aan te reiken. Ook andere stakeholders, zoals de Inspectie voor de Gezondheid (IGZ), kunnen deze openbare informatie gebruiken voor het monitoren van kwaliteit van zorg. Patiëntwaarderingswebsites worden, zeker in het buitenland, steeds vaker gebruikt om risico's in kwaliteit en veiligheid te detecteren. Ook het gebruik van informatie van patiëntwaarderingswebsites stuit echter op bezwaren vanuit het veld. Het gaat dan bijvoorbeeld over de representativiteit van de waarderingen, het vermeende gemak tot manipulatie van de informatie door instellingen of zorgverleners, of de onmogelijkheid tot het corrigeren voor patiëntkenmerken vanwege de anonimiteit.

Samenvatting onderzoeksresultaten

Dit proefschrift bestaat uit drie delen. Het eerste deel beschrijft de ontwikkeling en validatie van twee patiënttevredenheidsvragenlijsten. Het tweede deel beschrijft de resultaten van onderzoek naar tevredenheid wanneer het wordt gebruikt voor het vergelijken van ziekenhuizen onderling, en in de tijd. Het derde deel beschrijft het gebruik van ZorgkaartNederland als mogelijke bron voor het ontdekken van risico's in kwaliteit en veiligheid door de Inspectie voor de Gezondheid.

Deel I ontwikkeling en validatie van patiënttevredenheidsvragenlijsten
Hoofdstuk 2 beschrijft de ontwikkeling en de validatie van de 'Kernvragenlijst patiënttevredenheid in Academische Ziekenhuizen', de zogenoemde KPAZ. De acht academische ziekenhuizen in Nederland besloten in 2002 een korte kernvragenlijst voor hun patiënten te ontwikkelen. Het doel was om patiënttevredenheid te meten, de ziekenhuizen onderling te benchmarken en verbeterpotentieel aan te tonen. Bovendien wilden de academische ziekenhuizen transparant zijn over de oordelen van hun patiënten over de geleverde zorg. De KPAZ bestond uit twee versies, een voor de klinische opnamepatiënten en een voor poliklinische zorg. Patiënten werden bij de ontwikkeling van de KPAZ betrokken: alleen díe aspecten die voor patiënten het meest belangrijk waren werden in de KPAZ opgenomen. Dit betrof de *ontvangst op de afdeling/polikliniek*, de *bejegening en behandeling door verpleegkundigen*, de *bejegening en behandeling door artsen*, *informatievoorziening*, *privacy* en *ontslag en nazorg*. Dit proces leverde betrouwbare en valide vragenlijsten, te gebruiken om tevredenheid van patiënten op deze zes aspecten te screenen. Het onderzoek werd in drie rondes in alle acht de academische ziekenhuizen uitgezet. Het vond plaats volgens dezelfde procedures en tijdspad in 2003, 2005 en 2007. Resultaten van het onderzoek werden op specialismeniveau aan de ziekenhuizen gepresenteerd.

De resultaten gingen vergezeld met een interne (alle specialismen binnen een ziekenhuis) en een externe benchmark (de specialismen in vergelijking met dezelfde specialismen in de andere ziekenhuizen). Dit resulteerde in best practices, en inzicht in verbeterpotentieel. Ziekenhuizen konden vervolgens zelf met de resultaten aan de slag in vervolgtrajecten om verbeteringen door te voeren. Dit leidde ertoe dat vanaf 2004 ook veel algemene ziekenhuizen in Nederland de KPAZ gingen gebruiken om hun patiënttevredenheid in kaart te brengen en op basis daarvan verbeteringen te maken.

Hoofdstuk 3 beschrijft de ontwikkeling en validatie van de KPAZ voor dagbehandeling (KPAZ-D). Het aantal patiënten dat in dagbehandeling werd behandeld steeg flink in de laatste decennia. Dagbehandeling heeft voordelen voor de patiënt, zoals het voorkomen van ziekenhuisopnames, korte wachttijden en thuis herstellen van de behandeling. Het heeft echter ook nadelen. Patiënten geven bijvoorbeeld aan bang te zijn om 'te vroeg' naar huis gestuurd te worden. Ook moet de zorg thuis goed geregeld zijn. Om de kwaliteit van zorg van deze steeds groter groeiende groep patiënten in kaart te brengen, werd de KPAZ-D ontwikkeld. De klinische KPAZ kreeg twee extra aspecten die specifiek voor dagbehandelingpatiënten van belang waren: *verpleegkundig spreekuur*, over de voorbereiding van de opname, en *operatiekamer*. Uit dit onderzoek bleek dat de KPAZ-D een valide en betrouwbare vragenlijst is om de patiënttevredenheid van dagbehandelingpatiënten te meten en verbeterpotentieel aan te kunnen geven. Zodoende complementeerde de KPAZ-D het model van het meten van patiënttevredenheid voor de belangrijkste groepen patiënten in ziekenhuizen.

Deel II Vergelijking van patiënttevredenheid tussen ziekenhuizen en in tijd
Patiënttevredenheidsscores worden veel gebruikt om ziekenhuizen met elkaar te vergelijken, met als doel te komen tot best practices en inzicht in verbetermogelijkheden. Ziekenhuizen verschillen echter van elkaar in organisatie van zorg, en in patiëntenpopulatie. Om ziekenhuizen eerlijk met elkaar te kunnen vergelijken is het daarom noodzakelijk te kijken welke factoren patiënttevredenheid beïnvloeden, zodat een goede correctie voor verschillen in patiëntenpopulatie kan plaatsvinden. **Hoofdstuk 4** beschrijft een onderzoek dat analyseert of verschillen in patiënttevredenheid toe te schrijven zijn aan het ziekenhuis, de afdeling of de patiënt. Daarnaast werd gekeken naar voor welke karakteristieken gecorrigeerd moest worden wanneer ziekenhuizen de KPAZ-resultaten gebruiken om te benchmarken. Dit onderzoek wees uit dat slechts een klein deel van de variantie in patiënttevredenheid verklaard werd door verschillen tussen afdelingen of ziekenhuizen. De patiëntkenmerken leeftijd, opleiding en gezondheidstoestand hadden een relatief grote invloed op patiënttevredenheid, en moeten meegenomen worden in de case mix correctie voor een eerlijke vergelijking van patiënttevreden-heid in ziekenhuizen.

Patiënttevredenheid wordt gebruikt als indicator van kwaliteit van zorg, vaak naast meer klinische indicatoren, zoals ligduur in ziekenhuizen. Goede kwaliteit van zorg kan leiden tot een hogere patiënttevredenheid en een kortere ligduur. **Hoofdstuk 5** beschrijft een onderzoek naar de correlatie tussen patiënttevredenheid en ligduur van zeven specialismen in ziekenhuizen. Patiënten bleken echter even tevreden over ziekenhuizen met een korte gemiddelde ligduur als over ziekenhuizen met een langere gemiddelde ligduur. Het specialisme Longziekten vormde hierop de uitzondering: daar waren patiënten in ziekenhuizen met een kortere ligduur meer tevreden over de ontvangst op de afdeling, de informatie die zij kregen van verpleegkundigen bij opname, de deskundigheid van verpleegkundigen, de overdracht tussen verschillende professionals en de privacy. Het feit dat er bij de andere specialismen geen correlatie gevonden is kan te maken hebben met dat ligduur meer verbonden is met bijvoorbeeld logistieke aspecten van zorg, terwijl tevredenheid meer gerelateerd is aan patiëntgerichte zorg. Om daadwerkelijk een relatie tussen beide indicatoren te kunnen vinden is het in toekomstig onderzoek aan te raden patiënten direct te vragen naar hun tevredenheid over de ligduur in het ziekenhuis.

Wanneer ziekenhuizen, op basis van case mix gecorrigeerde patiënttevredenheidsscores, verbeteracties in de zorg initiëren, is het nodig de patiënttevredenheid in de tijd te monitoren. Het kost immers vaak langere tijd voordat kwaliteitsverbeteringen daadwerkelijk geïmplementeerd zijn in de dagelijkse zorg. In de praktijk blijkt dat monitoring van patiënttevredenheidsresultaten in ziekenhuizen niet veel gebeurt. Dit heeft tot gevolg dat informatie over de effectiviteit van verbeterprogramma's vanuit het patiëntenperspectief gemist wordt. **Hoofdstuk 6** beschrijft een trendanalyse over vier landelijke metingen met de KPAZ in de acht universitair medische centra (UMC's), in 2003, 2005, 2007 en 2009. Het doel van dit onderzoek was te zien of er trends in tevredenheid waren, en wat de consequenties waren voor kwaliteitsverbetering. De vier landelijke onderzoeken vonden tegelijkertijd plaats in de acht ziekenhuizen en volgens identieke procedures. De resultaten werden op specialismeniveau teruggekoppeld aan de ziekenhuizen, met bijgevoegde commentaren van patiënten. De UMC's konden zo in vervolgtrajecten gericht verbeteracties inzetten. Uit de trendanalyse bleek dat er significante, positieve trends te zien waren op landelijk en ziekenhuisniveau, zowel in de klinieken als de poliklinieken.

Dit effect was echter klein. Om de positieve tevredenheidscores beter te kunnen differentiëren heeft de KPAZ een scheve verdeling van antwoordcategorieën, vier positieve en een negatieve categorie. Dit bleek effectief: zelfs bij controle voor het vermeende plafondeffect van tevredenheid bleek een substantieel aantal scores te verbeteren in tijd. Dit gold ook voor UMC's die al een hoge tevredenheidscore hadden aan het begin van de metingen. De grootste stijging in tevredenheid vond niet per definitie plaats in UMC's met een lage beginscore. Hoge tevredenheidscores betekenen dus niet dat er geen verbetering meer mogelijk is. De conclusie uit dit onderzoek is dan ook dat het monitoren van patiënttevredenheidsscores in de tijd een waardevolle bijdrage levert aan het bepalen van de effectiviteit van verbeterprogramma's. Daarnaast is het van belang om tevredenheidscores van bepaalde subgroepen in kaart te brengen, bijvoorbeeld van de groep ontevreden patiënten. Juist deze groep kan risico's in kwaliteit of veiligheid in de zorg aangeven, waarop verbeteringen mogelijk zijn. Dit kan leiden tot verbetering van patiëntgerichte zorg voor alle patiënten.

Deel III Patiëntwaarderingswebsites als nieuwe ontwikkeling in monitoring kwaliteit van zorg

Hoofdstuk 7 beschrijft een onderzoek naar reviews op de patiëntwaarderingswebsite ZorgkaartNederland. Dit is de bekendste en grootste waarderingswebsite in Nederland, een initiatief van de Nederlandse Patiënten en Consumenten Federatie (NPCF). Er is gekeken of de waarderingen die patiënten over ziekenhuizen en zorgverleners plaatsen mogelijke risico's op het gebied van patiëntveiligheid bevatten, en zoja, welke. Daarmee werd onderzocht of ZorgkaartNederland kan bijdragen aan het risicogestuurd toezicht van zieken-huisinspecteurs van de IGZ. Hiertoe zijn twee rondes individuele interviews gehouden met tien ziekenhuisinspecteurs om hun ideeën over de bruikbaarheid van patiëntwaarderingen voor toezicht te onderzoeken. Daarnaast kregen de inspecteurs negatieve waarderingen over een ziekenhuis voorgelegd, om te bepalen of de inhoud voor toezicht relevante informatie over patiëntveiligheidsrisico's bevatte. 23 procent van deze negatieve waarderingen bleek, volgens de inspecteurs, informatie te bevatten die relevant was voor toezicht. Dat betrof informatie over risico's in patiëntveiligheid, zoals medicatiefouten, incidenten, schade of blijvende gevolgen voor de patiënt. Ook structurele organisatorische problemen zagen zij als relevante informatie. Voorbeelden hiervan waren waarderingen die gingen over disfunctionerende afdelingen of zorgverleners, of over bekende thema's die op dat moment speelden in het ziekenhuis. Verder was van belang dat de waarderingen overeen kwamen met het profiel van het ziekenhuis. Wanneer dit niet het geval was, zag de inspecteur dat als een risico. Een voorbeeld hiervan betrof een waardering over problemen rond een maagverkleiningsingreep. Volgens de inspecteur hadden die problemen niet mogen plaatsvinden, omdat het ziekenhuis een gespecialiseerd bariatrisch centrum heeft. De inspecteurs bleken na afloop van het onderzoek voorzichtig positief over de bijdrage van de reviews aan risicodetectie voor toezicht. Voor hen bleek Zorgkaart-Nederland een extra bron om risico's te detecteren. Zij gaven echter ook aan dat de risico's uit deze waarderingen altijd geverifieerd met en vergezeld moeten worden van andere kwaliteitsindicatoren en bronnen van risicotoezicht.

Dit proefschrift laat zien dat patiënttevredenheidsvragenlijsten zoals de KPAZ en KPAZ-D valide en betrouwbare informatie kunnen opleveren voor de monitoring van kwaliteit en veiligheid vanuit het patiëntenperspectief. Wanneer ziekenhuizen ze gebruiken voor het vergelijken met andere ziekenhuizen, of in de tijd, met als doel verbetermogelijkheden te detecteren, is case mix correctie op de patiëntkenmerken opleiding, leeftijd en gezondheidstoestand noodzakelijk. Daarnaast is het belangrijk om resultaten te presenteren op een laag niveau in de ziekenhuizen, bijvoorbeeld op specialisme- of afdelingsniveau. Tekstuele commentaren van patiënten zijn daarbij een noodzakelijke aanvulling. Ook is het waardevol de resultaten te differentiëren naar vraagniveau of patiëntgroepen, bijvoorbeeld ontevreden patiënten, en percentages van gegeven antwoorden weer te geven naast gemiddelde scores. Tot slot laat het proefschrift zien dat de reviews op ZorgkaartNederland kunnen bijdragen aan het detecteren van risico's in patiëntveiligheid, en zodoende gebruikt kunnen worden als toegevoegde bron voor risicogestuurd toezicht door de IGZ.

Discussie

De discussie gaat allereerst in op de onderzoeksresultaten in relatie tot de conceptuele overwegingen zoals beschreven in de introductie. Vervolgens komen enkele methodologische overwegingen aan bod. De discussie sluit af met consequenties voor beleid en toekomstig onderzoek.

Overwegingen ten aanzien van het begrip patiëntenperspectief

In de introductie werden vier bezwaren beschreven tegen het gebruik van het patiëntenperspectief in beoordeling van kwaliteit van zorg: het begrip patiënttevredenheid kent verschillende dimensies, en is daardoor moeilijk te meten, het oordeel vanuit patiëntenperspectief is subjectief en individueel bepaald, tevreden-

heidscores zijn erg hoog, en ten slotte is het discriminerend vermogen van tevredenheidvragenlijsten beperkt. Deze bezwaren maken het, volgens opponenten, moeilijk om resultaten van tevredenheidonderzoek te gebruiken om verbetermogelijkheden in kwaliteit van zorg aan te geven.

Dit proefschrift laat zien dat, ondanks dat patiënttevredenheid verschillende dimensies kent, dit wel degelijk valide en betrouwbare onderzoeksresultaten oplevert om kwaliteit van zorg vanuit het patiëntenperspectief te beoordelen. Niettemin blijft één belangrijke dimensie van tevredenheid onderbelicht: de verwachtingen van patiënten. Dit aspect is ook in ons onderzoek met de KPAZ en KPAZ-D niet meegenomen. Dat heeft te maken met het doel waarvoor de KPAZ ontwikkeld is: screening van patiënttevredenheid op de voor patiënten meest belangrijke aspecten om vervolgens in vervolgonderzoek verbetermogelijkheden te kunnen bepalen. Verwachtingen van patiënten spelen een belangrijke rol in het oordeel van patiënten over kwaliteit van zorg. Toch wordt er in de praktijk nog weinig naar gevraagd, of mee gedaan. Het zou een waardevolle aanvulling zijn voor ziekenhuizen om professionals te trainen in het vragen naar patiëntverwachtingen en het managen daarvan. Dat zal zeker ten goede komen aan verbeteren van patiëntgerichte zorg.

Het perspectief van patiënten op kwaliteit van zorg is per definitie subjectief. Ons onderzoek naar reviews op ZorgkaartNederland toont aan dat, ondanks de subjectiviteit, patiënten wel degelijk risico's in kwaliteit en veiligheid kunnen aangeven. Het patiëntenperspectief is dus, juist dankzij die subjectiviteit, een aanvulling op al gebruikte objectieve en klinische uitkomstindicatoren.

Patiënten in Nederland zijn tevreden over de kwaliteit van zorg in ziekenhuizen. Niettemin gaf ons onderzoek aan dat er, ondanks die hoge scores, ruimte voor verbetering mogelijk is. Voor ziekenhuizen is het van belang om de hoge scores zo hoog mogelijk te houden, en de spreiding in scores te verkleinen. Daarnaast bleek uit ons onderzoek dat differentiatie naar subgroepen van belang is. Door te kijken naar oordelen van bijvoorbeeld de groep ontevreden patiënten, en te werken aan de aspecten die zij aangeven, is verbetering van patiëntgerichte zorg voor die groep ook bereikbaar. Tot slot is het monitoren van de scores door de tijd heen van belang. Dalende scores kunnen een stagnatie in kwaliteitsverbetering aanduiden. Patiënttevredenheidsscores kunnen zodoende als indicator gebruikt worden door stakeholders bij het monitoren van kwaliteit van zorg.

Ons onderzoek gaf aan dat niet ziekenhuis- of afdelingskenmerken, maar de patiëntkenmerken opleiding, leeftijd en gezondheidsstatus het meest van invloed zijn op tevredenheid. Daarmee is inderdaad het discriminerend vermogen van tevredenheidvragenlijsten om significante verschillen tussen ziekenhuizen in kwaliteit van zorg vast te stellen, beperkt. Deze beperking geldt echter ook voor andere methoden om vanuit het patiëntenperspectief kwaliteit van zorg te beoordelen, en is kennelijk inherent aan het beoordelen van kwaliteit vanuit patiëntperspectief. Niettemin konden we, als gevolg van onze grote steekproef aan patiënten en de case mix correctie op de genoemde patiëntkenmerken, in ons onderzoek wel significante verschillen tussen ziekenhuizen en afdelingen aantonen. Case mix correctie, en een voldoende grote steekproef, zijn voorwaarden om een eerlijke vergelijking tussen ziekenhuizen mogelijk te maken, en verbeterpotentieel aan te geven.

Methodologische overwegingen

Elk hoofdstuk in dit proefschrift bevat methodologische kanttekeningen specifiek voor de uitgevoerde studie. Hieronder volgen nog enkele methodologische overwegingen van algemene aard bij het doen van onderzoek naar kwaliteit van zorg vanuit het patiëntenperspectief.

Omdat de onderzoeken met de KPAZ en de KPAZ-D anoniem uitgevoerd zijn, konden we geen non-respons analyses toepassen. Het kan dus zijn dat zeer tevreden, of zeer ontevreden patiënten vooral de vragenlijsten beantwoord hebben. Niettemin is het aantal deelnemers in de studies behoorlijk te noemen, in vergelijking met ander onderzoek naar patiënttevredenheid. Daarnaast liet het hoofdstuk over de case mix factoren zien dat responspercentage als ziekenhuisvariabele geen bepalende factor was in tevredenheid van patiënten.

Hoewel alle studies tot doel hadden aspecten voor kwaliteitsverbetering aan te geven, viel onderzoek naar de effectiviteit van de ingezette kwaliteitsverbeteractiviteiten niet binnen onze scope. Effectiviteitstudies van verbeteracties op basis van onderzoek naar kwaliteit van zorg vanuit het patiëntenperspectief is zeker een belangrijk onderdeel van toekomstig onderzoek.

Consequenties voor beleid en toekomstig onderzoek

Het patiëntenperspectief en kwaliteitsverbeteringen

Presentatie van resultaten van onderzoek naar kwaliteit van zorg vanuit het patiëntenperspectief, met als doel het aangeven van verbetermogelijkheden, kan baat hebben bij de volgende aandachtspunten:

- Vragenlijstonderzoek als startpunt om aan te geven wáár patiënten ontevreden over zijn, vervolgonderzoek om aan te geven waaróm patiënten daar ontevreden over zijn en wat er aan verbeterd kan worden;
- Vergelijken van ziekenhuizen, afdelingen of specialismen, en in de tijd met voldoende steekproefgrootte, en gecorrigeerd voor de patiëntkenmerken opleiding, leeftijd en gezondheidstoestand;
- Presentatie van resultaten op een lager niveau (specialisme, afdeling, zorgverlener);
- Aanvulling met kwalitatieve commentaren van patiënten;
- Analyse en presentatie op vraagniveau, of van alleen relevante vragen;
- Analyse en presentatie van specifieke subgroepen (bijvoorbeeld ontevreden patiënten);
- Presentatie van percentages van gegeven antwoorden in aanvulling op gemiddelde scores;
- Analyse van effecten van verbeteracties.

Zodoende kunnen verbeteracties op maat en gericht ingezet worden en wordt de bruikbaarheid van onderzoek naar het patiëntenperspectief op kwaliteit en veiligheid van zorg verhoogd.

Het patiëntenperspectief en risicodetectie in patiëntveiligheid

Het gebruik van het patiëntenperspectief op kwaliteit en veiligheid van zorg in het toezicht is een belangrijk onderdeel van het Meerjarenbeleidsplan 'Gezond Vertrouwen' (2016-2019) van de IGZ. De ziekenhuisinspecteurs zagen het gebruik van reviews op ZorgkaartNederland om risico's in patiëntveiligheid te detecteren als mogelijk waardevolle aanvulling op al gebruikte bronnen. De inspecteurs stelden hier in eerste instantie echter wel voorwaarden aan: de reviews moeten bij voorkeur niet te subjectief zijn, niet te emotioneel zijn, en niet te veel gaan over bejegening van de patiënt door de zorgverlener. Kortom, aanvankelijk dachten ze met name meerwaarde te zien in bijdragen van patiënten die bij voorkeur in zekere zin 'klinisch' zijn, ontdaan van subjectiviteit. Dat is opmerkelijk, omdat subjectiviteit bij uitstek hét kenmerk is van het patiëntenperspectief. Een verklaring hiervoor kan zijn dat inspecteurs zich richten op veiligheidsaspecten; zij zijn gewend te werken met klinische kwaliteits- en veiligheidsindicatoren en objectieve feiten. De subjectieve oordelen over zorg, en de manier waarop de patiënt bejegend wordt door de zorgverlener, vallen zodoende kennelijk buiten de scope van de ziekenhuisinspecteur. Na de reviews van ZorgkaartNederland beoordeeld te hebben op relevantie voor toezicht, waren zij positiever over de bruikbaarheid van de reviews. Zij gaven echter ook aan dat de reviews geverifieerd en vergezeld moeten worden van klinische veiligheidsindicatoren. De terughoudendheid van inspecteurs voor het benutten van subjectieve patiëntoordelen is een punt van aandacht voor de IGZ. Meer onderzoek naar de waarde van het patiëntenperspectief voor toezicht, en de validatie van oordelen vanuit het patiëntenperspectief met bijvoorbeeld klinische uitkomstindicatoren, of inspectieoordelen, zijn noodzakelijke voorwaarden voor het succesvol implementeren van het patiëntenperspectief in het risicogestuurd toezicht.

Het patiëntenperspectief en transparantie van kwaliteit van zorg

De Nederlandse overheid promoot transparantie van kwaliteit van zorg. Transparantie wordt gedefinieerd als de beschikbaarheid en vergelijkbaarheid van informatie over kwaliteit van zorgaanbieders. Het patiëntenperspectief op kwaliteit van zorg is daarbij een belangrijke bron. Vier actoren hebben belang bij transparantie van kwaliteit: patiënten, om een keuze voor een zorginstelling op te kunnen baseren, zorginstellingen om verbeteringen op te baseren en voor externe verantwoording, zorgverzekeraars om te gebruiken bij inkoop, en de overheid voor toezicht en inzicht in houdbaarheid van het stelsel. Onderzoek wees uit dat het vooral zorgverzekeraars zijn die proberen openbare kwaliteitsinformatie in hun inkoopprocedures te betrekken. Een minderheid van patiënten gebruikt openbare informatie om een zorginstelling te kiezen. Zorginstellingen, ondanks dat ze het patiëntenperspectief als bron voor kwaliteitsverbetering omarmen, zijn terughoudend als het gaat om het gebruik van het patiëntenperspectief op kwaliteit van zorg voor externe verantwoording.

Nu patiëntwaarderingswebsites met hun openbare informatie over kwaliteit van zorg een steeds grotere vlucht nemen, wordt deze bron steeds belangrijker voor de vier bovengenoemde actoren. Immers, steeds meer patiënten beoordelen hun zorginstelling of zorgverlener online, en een toenemend aantal zal hun keuze voor zorgverlener in de toekomst hierop gaan baseren. Voor zorginstellingen zal het dus belangrijker worden om de website als bron voor verbeteracties te gebruiken, zeker als ze hierop een lage waardering hebben, om zodoende beter in beeld te komen.

Zorgverzekeraars zouden goede instellingen kunnen 'belonen' door inkoop mede te baseren op basis van deze waarderingen van patiënten.
Het is dus van belang om onderzoek te doen naar de betrouwbaarheid en validiteit van patiëntwaarderingswebsites. Bovendien is het niet kunnen corrigeren voor patiëntkenmerken als gevolg van anonimiteit van de waarderingen een punt van aandacht bij deze websites. Toekomstig onderzoek zou zich met name op deze punten moeten richten, omdat ze van belang zijn bij het promoten van gebruik van deze bronnen voor transparantie. Daarnaast zijn ze van belang voor gebruik door de vier actoren in de beoordeling van kwaliteit van zorg vanuit het patiëntenperspectief.

Conclusie

Patiënttevredenheidsonderzoek, gedaan met de KPAZ-vragenlijsten, is een valide en betrouwbare methodiek om inzicht te krijgen in het patiëntenperspectief op kwaliteit en veiligheid in de zorg. Resultaten bleken nuttig en bruikbaar bij het evalueren van ziekenhuiszorg en dragen bij aan verbetering van kwaliteit van zorg, ondanks conceptuele en methodologische bezwaren. Patiëntwaarderingswebsites bieden nieuwe mogelijkheden voor ziekenhuizen en stakeholders als de IGZ om het patiëntenperspectief in te zetten als bron voor kwaliteitsverbetering of monitoring van kwaliteit en veiligheid van ziekenhuiszorg.

COPS-questionnaires

Inpatient COPS

Answering categories: unsatisfied, somewhat satisfied, rather satisfied, quite satisfied, very satisfied

Admission procedure
How satisfied were you with the reception on the ward?
How satisfied were you with the information provided by nurses on admission?

Nursing care
How satisfied were you with the personal attention of the nurses?
How satisfied were you with the expertise of the nursing staff?

Medical care
How satisfied were you with the personal attention of the doctors?
How satisfied were you with the expertise of the doctors?

Information
How satisfied were you with the clarity of information given by nurses?
How satisfied were you with the clarity of information given by doctors?
How satisfied were you with the way the information was transferred from one person to another?
How satisfied were you with the speed of the results of the diagnostic tests?

Autonomy
How satisfied were you with the degree of encouragement to be self-sufficient?
How satisfied were you with the degree to which you could participate in treatment decisions?
How satisfied were you with the privacy you were given such as in conversations with doctors during physical examinations and during visiting times?

Discharge and aftercare
How satisfied were you with the information provided about further treatment?
How satisfied were you with the transfer of information to external professionals, such as your GP?
How satisfied were you with the discharge procedure?

Outpatient COPS

Answering categories: unsatisfied, somewhat satisfied, rather satisfied, quite satisfied, very satisfied

Reception
How satisfied were you with the reception at the outpatient department?
How satisfied were you with the rapidity of being able to speak to the staff?
How satisfied were you with the degree of support of the staff?

Nursing care
How satisfied were you with the personal attention of the nurses?
How satisfied were you with the expertise of the nursing staff?

Medical care
How satisfied were you with the personal attention of the doctors?
How satisfied were you with the expertise of the doctors?

Information
How satisfied were you with the clarity of information given by nurses?
How satisfied were you with the clarity of information given by doctors?
How satisfied were you with the way information was transferred from one person to another?
How satisfied were you with the rapidity of learning research results?

Autonomy
How satisfied were you with the degree to which you could participate in treatment decisions?
How satisfied were you with the privacy you were given such as conversations with staff or doctors during physical examinations?

Discharge
How satisfied were you with the information provided about further treatment
How satisfied were you with the transfer of information to external professionals, such as your G.P., the rehabilitation centre or district nurses?

Day care COPS

Answering categories: unsatisfied, somewhat satisfied, rather satisfied, quite satisfied, very satisfied

Pre-admission visit
How satisfied were you with the reception?
How satisfied were you with the personal attentions of the nurse?
How satisfied were you with the expertise of the nurse?
How satisfied were you with the information and instruction?

Admission at the day care centre
How satisfied were you with the reception at the day care centre?
How satisfied were you with the rapidity of being able to speak to the staff?
How satisfied were you with the degree of support of the staff?

Operation Room
How satisfied were you with the reception at the Operation Room?
How satisfied were you with the personal attention of the operation staff?
How satisfied were you with the expertise of the operation staff?

Nursing care
How satisfied were you with the personal attention of the nurses?
How satisfied were you with the expertise of the nursing staff?

Medical care
How satisfied were you with the personal attention of the doctors?
How satisfied were you with the expertise of the doctors?

Information
How satisfied were you with the clarity of information given by nurses?
How satisfied were you with the clarity of information given by doctors?
How satisfied were you with the way information was transferred from one person to another?
How satisfied were you with the rapidity of learning research results?

Autonomy
How satisfied were you with the degree of encouragement to be self-sufficient?
How satisfied were you with the degree to which you could participate in treatment decisions?
How satisfied were you with the privacy you were given such as conversations with doctors during physical examinations and during visiting times?

Discharge
How satisfied were you with the information provided about further treatment?
How satisfied were you with the transfer of information to external professionals, such as your G.P.?
How satisfied were you with the discharge procedure?

Dankwoord

"Ik ga ooit promoveren, vóór mijn 65e ", riep ik al jaren. En nu is het dan zover, (zeer) ruim voor mijn pensioengerechtigde leeftijd. Dat dit mooie traject afgerond is heb ik mede te danken aan bijdragen van veel mensen, waarvan ik een aantal graag wil noemen.

Allereerst dr. R.B. Kool (Tijn), omdat hij mijn ambitie al snel zag en ook menig keer in daden wilde omzetten, waarbij ik altijd weer op de rem trapte: nu nog niet, want… "tijd zat", "jonge kinderen" etc. De aanhouder wint, want toen zich in 2010 een kans bij Prismant voordeed, en ik geen smoes meer voorhanden had, overtuigde hij mij zonder moeite om die kans met beide handen aan te grijpen. Tijn, dankzij die gelegenheid, de prettige inhoudelijke begeleiding en samenwerking door de jaren heen, af en toe een motiverende schop-onder-de-kont of pep-talk, is dit proefschrift mede tot stand gekomen. Dank!

Toen de keuze voor een promotietraject over patiënttevredenheid in ziekenhuizen gemaakt was, was de volgende stap een logische: een afspraak met prof. dr. Hanneke de Haes, als (mede)initiator en ontwikkelaar van de Kernvragenlijst Patiënttevredenheid in Academische Ziekenhuizen (KPAZ). Hanneke reageerde direct enthousiast op ons promotievoorstel en haar rol als promotor daarin. Dankzij de kans die zij mij bood, haar brede helicopter-view op het thema en rake "Nu speel ik even advocaat van de duivel"-opmerkingen ligt er nu een gedegen proefschrift. Hanneke, bedankt hiervoor.

Hanneke stelde dr. L.C. Zandbelt (Linda) voor als copromotor. Daar was ik erg blij mee, want ik kende Linda al als coördinator vanuit de KPAZ-projecten. Zij belde vanuit die functie regelmatig met de vraag "Waarom heb je dat zo gedaan?" en nam geen genoegen met de gemakkelijke uitleg. Linda is enorm accuraat, geen detail ontgaat haar, en zij heeft met haar kritische inhoudelijke, tekstuele en analytische blik een essentiële bijdrage geleverd aan dit proefschrift. Dank hiervoor, Linda, maar daarnaast waardeerde ik ook jouw altijd positieve, attente en ondersteunde mails de afgelopen jaren zeer!

Graag dank ik de leden van de promotiecommissie, prof. dr. G.H. Blijham, prof. dr. D.M.J. Delnoij, prof. dr. ir. R.D. Friele, prof. dr. S.E. Geerlings, prof. dr. M.J.M.H. Lombarts en prof. dr. E.M.A. Smets, voor hun bereidheid mijn manuscript te beoordelen en plaats te nemen in de promotiecommissie. Daarnaast gaat mijn dank

uit naar dr. J.A.A.M. van Diemen-Steenvoorde, Inspecteur Generaal van de Inspectie voor de Gezondheidszorg (IGZ), voor haar bereidheid als gastopponent aan de promotiecommissie deel te nemen.

Om zij dit onderzoek mogelijk gemaakt hebben, dank ik uiteraard de vele duizenden (anonieme) patiënten die de moeite genomen hebben in de afgelopen jaren een patiënttevredenheidsenquête in te vullen, of een review achter te laten op ZorgkaartNederland. Mede dankzij hun stem kunnen we samen de zorg verbeteren. Graag dank ik de NFU, en de acht UMC's, voor het beschikbaar stellen van de data uit de KPAZ-trajecten voor verder onderzoek. Zonder die bereidheid om transparant te zijn over de tevredenheid van hun patiënten was dit proefschrift niet tot stand gekomen. Dat geldt ook voor de vele algemene ziekenhuizen voor wie ik in de loop der jaren patiënttevredenheidsonderzoeken mocht uitvoeren; deze data hebben mede bijgedragen aan dit proefschrift. Daarnaast gaat mijn dank uit naar de NPCF voor hun bereidheid de data van ZorgkaartNederland voor risicogestuurd toezicht van de IGZ beschikbaar te stellen. Bovendien waardeer ik het zeer dat de tien gevraagde ziekenhuisinspecteurs allen bereid waren mee te werken aan de studie naar de mogelijke bijdrage van reviews van patiënten op ZorgkaartNederland aan het risicogestuurd toezicht, zoals beschreven in hoofdstuk 7.

Gedurende het promotietraject had ik een werkplek op de afdeling Medische Psychologie in het AMC. Graag dank ik alle collega's in de afgelopen jaren voor de inspirerende wetenschappelijke omgeving, maar natuurlijk ook voor de gezellige vrijdagmiddag-praat.
Ik waardeer het zeer dat de Inspectie voor de Gezondheidszorg, in het bijzonder Ine Borghans, Jeroen Geelhoed en Sipko Mülder, mij de gelegenheid heeft gegeven om het onderzoek ook in mijn nieuwe baan te kunnen voortzetten. Paul Robben dank ik voor de waardevolle wetenschappelijke adviezen vanuit toezichtsperspectief en mijn collega's voor hun belangstelling.

In het bijzonder dank ik mijn (oud-)collega's Sjenny Winters, Ine Borghans en Rutger Sonneveld. We zaten alle vier in het zelfde promotieschuitje, met de bekende ups en downs. Jullie hebben inmiddels veilig de overkant gehaald en ik dank jullie dan ook graag voor jullie steun, helpende handen en luisterende oren. Ine en Rutger, dank dat jullie mijn paranimfen willen zijn op deze bijzondere dag.

Dank ook aan mijn familie, schoonfamilie en vrienden voor jullie belangstelling voor mijn promotietraject gedurende de afgelopen 6,5 jaar. In het bijzonder dank ik Hans Diemel, voor je enthousiaste bijdrage aan het bedenken van de stellingen, Annemeik voor onze nachtelijke promopraat met versnaperingen tijdens de gezamenlijke vakantieweek, Richard voor je prachtige lay-out van het proefschrift en Ruurd Jelle voor alle mooie foto's en de moeilijke keuze daaruit voor de kaft. Alma, Bouke, Inemarie en Paul, Emiel en de vijf kornuiten Gideon, Ruben, Ruurd Jelle, Niels en Marius plus dames en mini's, dank voor jullie onvoorwaardelijke liefde, slap geouwehoer en gezelligheid.
Tot slot Mark, en ons 'addergebroed' Jola en Kiki. "Hoe doe je dat, maar één dag per week werken aan je promotietraject en niet 's avonds of in het weekend?", is me vaak gevraagd. Nou gewoon, omdat ik thuis het allerliefste lekker bij jullie ben. Heel gemakkelijk!

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Vermeulen, J.A., **S.M. Kleefstra**, E.M. Zijp, R.B. Kool. *Understanding the impact of supervision. Lessons based on improving medication safety in long-term elderly care*

Portfolio

General courses

- Computing in R, AMC Graduate School (2016)
- Endnote, AMC Graduate School (2015)
- Effectief Beïnvloeden, KSG (2013)
- Biostatistics, AMC Graduate School (2012)
- Scientific writing in English, AMC Graduate School (2011)
- Reference Manager, AMC Graduate School (2011)
- PubMed, AMC Graduate School (2011)
- Kwalitatief onderzoek, dr. H. Boeije, Universiteit Utrecht (2009)
- SPSS, vervolg analytische mogelijkheden, bureau SPSS Benelux bv (2009)
- SPSS, analystische vaardigheden, bureau SPSS Benelux bv (2008)
- Introductie SPSS, bureau SPSS Benelux bv (2005)
- Creatief Schrijven, School van Journalistiek, Utrecht (2000)

Poster presentations

Kleefstra, S.M., R.B. Kool, C.M.A. Veldkamp, A.C.M. Winters-van der Meer, M.A.P. Mens, G.H. Blijham, J.C.J.M. de Haes. *Nationwide satisfaction surveys in Dutch academic hospitals.* ISQUA, October 2009, Dublin, Ireland

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Curriculum Vitae

Sorien Kleefstra was born in Emmeloord, the Netherlands, on the 25th of September, 1969. In 1988 she finished secondary school at the R.K.S.G. Marianum in Groenlo. She began studying Education and Child Studies at the Radboud University in Nijmegen before switching in 1989 to Leiden University where she studied French Language and Literature. A year after this French trip, she moved to Leiden's Faculty of Social and Behavioural Sciences obtaining her master's degree in Educational Sciences, with Communication as main subject, in 1995. She then moved to Utrecht and started working at the Dutch Railways Customer Services, which was then undertaking a major organizational and cultural change. There, she supported the implementation of the concept of 'customer satisfaction'. In 1998 she started as a researcher at NZi, the National Hospital Institute, which, after merging with the SIG, the Health Care Information Centre, became Prismant in 2000, an independent health research organization. Initially, she supported care and cure organizations in improving their quality of care. Then after 2002, she participated in the development and validation of the COPS for the Dutch Federation of University Medical Centres (NFU). As such, she performed four national patient satisfaction studies among the eight university medical centres in 2003, 2005, 2007 and 2009. At the same time, she supported many general hospitals in performing patient satisfaction research, providing national benchmarks used for improving their quality of care. In November 2010, she started her PhD-thesis on patient satisfaction research at the Academic Medical Centre in Amsterdam. Since 2013, she has been working as a senior advisor at the Dutch health care inspectorate (IGZ) at its department of Risk Detection and Development. Her main subject is to implement the patient's perspective in the daily supervision of health care inspectors. Sorien lives in Vleuten, near Utrecht, with her partner Mark Drost and their two daughters Jola (2001) and Kiki (2004).