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Paediatric Perianesthesia Questionnaire: development and data from eight hospitals across Germany

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Key points

- Patient satisfaction, as a quality indicator, is becoming a popular subject for the study.
- Authors developed a questionnaire, which was completed by >1000 children, or parents.
- 'Privacy and waiting', 'information giving', and 'discomfort' were the most important determinants of satisfaction/dissatisfaction.
- This novel method can be used for further research on interventions to improve patient satisfaction.

Background. Opinions about satisfaction with care are rarely obtained from children and few studies of this type exist in the area of paediatric anaesthesia. In this study, we developed a comprehensive self-administered questionnaire to measure the level of paediatric and, as a substitute in younger children, parental satisfaction with anaesthesia. In addition, we aimed to identify factors influencing satisfaction and compare results between hospitals.

Methods. We followed a rigorous protocol including construction of a pilot questionnaire and qualitative and quantitative analysis. The questionnaire was adapted for confounding variables. We analysed satisfied and dissatisfied groups and compared satisfaction scores between participating hospitals.

Results. A questionnaire was developed which comprised 37 questions assessed on a five-point Likert scale. With a response rate of 71%, a total of 1052 patients completed the questionnaire. In the final analysis, 760 questionnaires (72%) were included. Most questionnaires were answered by the parents [705 (92.8%)]. The mean age of children was 6.7 (4.97) yr. Multivariate analysis found a history of previous anaesthetic problems and the identity of the person answering the questionnaire as influencing factors on the sum score. The most important differences between satisfied and dissatisfied children were found for the dimensions 'privacy and waiting', 'information giving', and 'discomfort'. Scores differed between hospitals.

Conclusions. Our psychometric questionnaire provides a novel approach to paediatric patient satisfaction with anaesthesia care and covers areas deemed important by children, parents, and carers. Significant differences between satisfied and dissatisfied groups and between participating hospitals were found.

Keywords: audit; measurement techniques; outcome; paediatric anaesthesia; patient satisfaction; surgery

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Research investigating children's satisfaction with anaesthesia care is scarce, despite the increasing awareness and growing discussion regarding the rights of children to participate in research and make decisions about their own healthcare.[1]

Increasing competition in the healthcare marketplace has fuelled the drive towards increased use of questionnaires to measure patient satisfaction.[2] Their quality depends largely on construction, validation, and sampling.[3] A variety of instruments have been developed for adults over the last few years, some adhere to psychometric protocols and take some of the complexities of healthcare into account.[2 4–7] The multidimensional nature of satisfaction still limits the development of questionnaires.

Assessing children's experiences with anaesthesia care is even more complex. Answering a questionnaire requires explicit recall, which in turn requires explicit memory which children begin to develop at around 3 yr of age.[8] Parental opinions of satisfaction with care have previously been used as a substitute for opinions from children and adolescents.

The simplicity of some existing instruments limits the identification of all aspects of satisfaction;[9] other studies have focused on general aspects of care[10] or on certain aspects of the anaesthetic experience.[11 12]

The purpose of this descriptive comparative survey was to construct a self-administered questionnaire to measure paediatric patient satisfaction in conjunction with all stakeholders that can be answered by older children, or parents

in conjunction with younger children. In addition, we compared results from the questionnaire between different hospitals.

Methods

The study was approved by the Institutional Research Ethics Committee. Written informed consent was obtained from parents but requirements for written consent in children was waived, the questionnaire had to be handed from the parent/legal guardian to the child. Data were gathered from eight anaesthetic departments across Germany. A, university hospital (1650 beds); B, tertiary hospital (1000 beds); C, university hospital (1200 beds); D, tertiary hospital (940 beds); E, tertiary hospital (1440 beds); F, tertiary hospital (1400 beds); G, primary hospital (355 beds); and H, secondary hospital (556 beds). For the initial development of the questionnaire, patients at hospital A were recruited.

Inclusion criteria were age <16 yr (or any age when treated within paediatric departments), ability to speak (read, write) and understand German, and elective procedures under general or regional anaesthesia.

A number of general questions were also included in the questionnaire. Visual analogue scales (VAS) were used to rate general treatment by the surgical and anaesthetic departments.

The development of the questionnaire followed steps of a psychometric protocol[13] and statistical evaluation[14 15] as follows.

Items

A literature review using MedLine was supplemented by semi-structured interviews with patient families and one-to-one interviews with older children and healthcare professionals to identify an initial set of items. All interviews and the comprehension probing were conducted by an interviewer trained in relevant interview techniques and with experience from previous studies.[7] Answers were transcribed and tape recorded by a second person. Interviews were conducted until no new ideas emerged from the analysis. Families were selected for the interviews and the 'comprehension probing' with the help of the ward nurses who indicated which families would be most likely to participate. It was not intended to interview a representative sample; instead, we wanted to poll typical test persons to generate a theoretical sample.[16]

Items were worded into questions to contain only single ideas; some had to be phrased into several questions. Questions were designed to be non-biased[17 18] and answered on a five-point Likert scale (4, strongly agree; 3, agree; 2, neither agree nor disagree (neutral); 1, disagree; and 0, strongly disagree). All questions were arranged in the chronological order. The literacy standard was set to fourth-grade reading level using the 'fog index' (Microsoft®).

The word 'satisfaction' was avoided and questions were phrased to detect higher levels of dissatisfaction.[7]

In addition to the initial questionnaire, a small number of participants were asked to answer a set of 11 probing questions, for example, investigated words and expressions (Please tell me, . . . what does the word concern mean to you?), fixed periods (. . . whether the consultation with the anaesthetist happened before or after the procedure?), or feelings (. . . what happens to you if you feel cold or freezing?) and the interviewer referred to the corresponding questions in the questionnaire. At the end, the interviewer asked whether any questions were difficult to understand, and these were discussed on a needs basis. This 'comprehension probing' was designed to assess whether the meaning or subjects of the questions were understood.

This was followed by an interim analysis of reliability and validity.[14 19] With each step of the construction (i.e. at the end of the interviews and with the initial questionnaire before the probing questions were given), items were ranked on a four-point Likert scale with 0=unimportant to me to 3=very important to me by the participant, mostly children and parents in unison. After each step, an expert group (consisting of one psychologist, one German philologist, and three anaesthetists) reviewed each item to ensure that no important items were eliminated.

Parents were instructed to ask the questions in a neutral tone if they administered the Paediatric Perianesthesia Questionnaire (PPQ) to the child.

Results were analysed to ensure that the questionnaire is a valid and reliable measure of patient's experiences. For the analysis, questionnaires with missing items were filtered to allow a maximum number to be analysed. For analysis of the scores, questionnaires with less than 20% missing items were included, and missing values were replaced by mean values.[4 20] Before analysis, negative items were reversed, and scores were transformed to a 0–100 scale, high scores indicate a high level of satisfaction or approval.

Dimensions

Before the exploratory principal component analysis (PCA), the Kaiser–Meyer–Olkin (KMO) measure was obtained with a value above 0.5, indicating that distinct and reliable dimensions are produced by factor analysis. The Bartlett's test of sphericity was obtained to test the variables in the population correlation matrix, its significance indicating a non-correlation matrix, thus suitability for a PCA. The measure of sampling adequacy (MSA) was obtained for each item with values exceeding 0.5 to ensure that the variables sufficiently correlated with one another.[21 22] Factor analysis with PCA, correlation matrix, scree plot for multiple factors, and varimax rotation[23] was used to detect the number of dimensions.

Validity

After the study protocol allowed to achieve content validity, item-discriminant validity (IDV) was assessed for the extent to which items correlated with dimensions they were not hypothesized to represent. Items should have a higher correlation with their own dimension than with other dimensions