

# The relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire

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## Abstract

**Objectives** Empirical studies have confirmed that a trusting physician–patient interaction promotes patient satisfaction, adherence to treatment and improved health outcomes. The objective of this analysis was to investigate the relationship between social support, shared decision-making and inpatient's trust in physicians in a hospital setting.

**Methods** A written questionnaire was completed by 2,197 patients who were treated in the year 2000 in six hospitals in Germany. Logistic regression was performed with a dichotomized index for patient's trust in physicians.

**Results** The logistic regression model identified significant relationships ( $p < 0.05$ ) in terms of emotional support (standardized effect coefficient [sc], 3.65), informational support (sc, 1.70), shared decision-making (sc, 1.40), age (sc, 1.14), socioeconomic status (sc, 1.15) and gender (sc, 1.15). We found no significant relationship between 'tendency to excuse' and trust. The last regression model accounted for 49.1% of Nagelkerke's  $R$ -square.

**Conclusions** Insufficient physician communication skills can lead to extensive negative effects on the trust of patients in their physicians. Thus, it becomes clear that medical support requires not only biomedical, but also psychosocial skills.

**Keywords** Physician–patient interaction · Trust · Social support · Shared decision-making · Medical education

## Introduction

Empirical studies have confirmed that a trusting physician–patient interaction promotes adherence to treatment (Nguyen et al. 2009; Trachtenberg et al. 2005), improved health outcomes (Berrios-Rivera et al. 2006; Mollborn et al. 2005; Safran et al. 1998) and patient satisfaction (Hall et al. 2002; Janssen et al. 2007; Thom and Campbell 1997). Hence, trust seems to be a key component of the physician–patient interaction and consequently it appears relevant that physicians know how trust can be established and maintained. Although trust is highly correlated with patient satisfaction (Thom and Ribisi 1999) it can, nevertheless, be clearly separated from the latter. Trust can therefore be defined as the expectation of individuals that certain other individuals or institutions will meet their responsibilities to them. Trust in physicians can generally be divided into trust in competence, trust in agency, trust in control, trust in confidentiality and trust in disclosure (Mechanic and Meyer 2000). Whereas satisfaction tends to be based on past experience and refers to an assessment of performance, trust is forward directed and reflects a commitment to an ongoing relationship (Rowe and Calnan 2006).

The present study was based on the hypothesis that social support is a central mediating concept between physician's communication behaviour and patient's trust. Social support helps people to cope with stressful life events and can enhance physical, psychological and social well-being (Janssen and Pfaff 2005). Studies have

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consistently confirmed a positive effect of social support in terms of mortality, morbidity and self-rated health (Kaplan et al. 1994; Melchior et al. 2003). In general, the concept of social support distinguishes between four types of support: (1) emotional, (2) instrumental, (3) informational and (4) appraisal (House 1981). Emotional support includes empathy, care and concern. Instrumental support involves the provision of concrete assistance that directly helps a person in need and is often provided primarily by spouses, relatives and friends. Informational support provides assistance in the form of knowledge, information and skills that a person can use to solve problems. Appraisal support involves the provision of constructive feedback, affirmation and social contextualisation. We propose that two dimensions of social support are especially effective and meaningful in a trustful physician–patient relationship: (1) emotional and (2) informational support. These two dimensions of social support, which are essentially based on the interpersonal skills of physicians, have, in other studies, already proven to be highly effective in terms of fostering trust (Arora and David 2009). By developing and applying these interpersonal skills—e.g. listening empathetically to patient’s views (emotional support) and answering their questions clearly and honestly (informational support)—patients’ trust can be earned (Coulter 2002). Another aspect of the clinical encounter that seems to have an important impact on patient’s trust is the shared decision-making behaviour of the physician. There is growing evidence that more trust appears to be generated when patients who want to participate in the treatment process feel involved in decision-making (Hall et al. 2001; Keating et al. 2004; Krupat et al. 2001). Additionally, many studies have demonstrated that the involvement of patients in the processes of treatment and decision-making increase recovery rates and patient satisfaction (Flocke et al. 2002; Lerman et al. 1990; Loh et al. 2007; Mahler and Kulik 1990). Furthermore, it seems already to be empirically proven that shared decision-making is a preferred physician–patient interaction style (Murray et al. 2007; Scheibler et al. 2003). It has to be mentioned here, however, that there are some groups of patients who also perceive a more authoritarian style of communication as being caring and involving (Epstein 2006). The fewer choices these patients are given, the more likely they are to report involvement in care (Martin et al. 2003).

The aim of this study was to investigate the effect of perceived supportive and participatory communication styles by physicians on patient’s trust. Besides the control variables (age, gender and socioeconomic status) there are three central predictor variables: (1) emotional support, (2) informational support and (3) shared decision-making behaviour of physicians.

## Methods

The following analysis is based on data from a project entitled ‘Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care’ (Pfaff et al. 2003). The Cologne Patient Questionnaire consists of 36 modules which comprised 95 scales and 59 single items. The chosen items are intended to cover all aspects of acute care in a hospital. All the scales of the Cologne Patient Questionnaire were developed on the basis of group discussions with different groups of patients using in-depth interviews as well as think aloud techniques. This extensive procedure was chosen to ensure that the expressions used in the items really reflect the feelings and opinions of the patients.

Data were gathered as part of a cross-sectional, retrospective study of 4,192 inpatients in the internal medicine or surgical wards of six hospitals in Germany. To reach representativity to a certain extent, we chose a purposeful sampling method with three urban and three rural hospitals with different size and from different regions (Southern Germany, Northern Germany and Northrhine-Westfalia). One of the six chosen hospitals is a university hospital with about 1,200 beds, one is a teaching hospital with about 300 beds in Cologne (urban hospital; Northrhine-Westfalia), two were hospitals with about 400 and 250 beds, respectively, near Cologne (rural hospitals; Northrhine-Westfalia) and two hospitals of the German army with about 150 (rural hospital in Northern Germany) and 500 (urban hospital in Southern Germany) beds, respectively, where active soldiers as well as private persons were treated.

A 50% sample was drawn by random from patient registers of participating hospitals (a.o. patients treated between 14 February 2000 and 24 March 2000 on a ward for surgery or internal medicine). Patient data were gathered between 2000 and 2001. Patients were eligible for participation in this study if they were 18 years or older. Patients were excluded from the study when they died or moved without leaving an address ( $n = 474$ , 11.3%). A written questionnaire was distributed to all patients included in the study with an emerging return rate of 52.9% ( $n = 2,470$ ). Of those, 11% of the respondents ( $n = 273$ ) were excluded due to the limited data quality (missing values >30% in the scale items). The study was reviewed and approved by the Ethics Committee of the Medical Faculty of the University of Cologne.

The scale ‘trust in physicians\_short form’ is based on the Cologne Patient Questionnaire scale ‘trust in physicians’ (Cronbach’s Alpha 0.863). The scale reflects patients’ trust in specific individuals—here a group of doctors caring for their patients on the ward during their hospital stay. After a header ‘What is your opinion about

the doctors on the ward', the three items of the scale were worded as follows: (1) 'I completely trusted my doctors,' (2) 'I had the impression that the doctors are very competent' and (3) 'with the doctors in this hospital one is in good hands.' Four answer categories were given, ranging from 'do not agree at all' (1 point) to 'completely agree' (4 points) (Ommen et al. 2008).

The variable 'informational support' (Cronbach's Alpha 0.793) was formed by the sum of the scores of three items from the Cologne Patient Questionnaire survey module informational certainty (e.g. 'Doctors explained everything to me clearly and understandably'). Four answer categories ranged from 'strongly disagree' to 'strongly agree,' with each response category measured by a score from one to four points. All items were summed and then divided by the number of items. The variable 'emotional support' (Cronbach's Alpha 0.844) is formed from the total of the scores of four items from the Cologne Patient Questionnaire scale 'devotion,' which is designed to measure a patient's subjective perceptions regarding the emotional support of physicians. Empathy, the establishment of a good relationship and regular conversations which also take place outside the context of ward rounds, is the basic content of this scale (e.g., 'Doctors carried out conversations with me in a very empathic manner'). Four answer categories ranged from 'strongly disagree' to 'strongly agree,' with each response category measured by a score from one to four points. All items were summed and divided by the number of items. The Cologne Patient Questionnaire scale 'co-therapy' (Cronbach's Alpha 0.795) is comprised of four items and is designed to measure a patient's subjective perceptions regarding the degree of shared decision-making behaviour of physicians (e.g. 'The doctors wanted me to be actively involved in the treatment process'). Four answer categories ranged from 'strongly disagree' to 'strongly agree,' with each response category measured by a score from one to four points; all items were totalled and divided by the number of items (see Table 2 for wording of all items).

Information regarding age, gender, school education and occupation was extracted from the socio-demographic section. The variable socioeconomic status was computed on the basis of information concerning school education and occupation.

Positive correlations between variables which are meant to elicit patient perspectives can, however, be due to a tendency of respondents to be 'yeah-sayers' or 'nay-sayers'; to give socially acceptable answers and to excuse themselves or to seek to criticize (Perneger 2004). In order to control for confusing effects, a scale called 'tendency to excuse' was developed on the basis of a review of the literature and think aloud techniques (Steffen et al. 2008). The variable 'tendency to excuse' (Cronbach's Alpha 0.749) is a

measure for patient's willingness to excuse mistakes and inconvenience during a hospital stay and was formed by an amalgam of the scores of three items from the Cologne Patient Questionnaire (e.g. 'I am willing to overlook adverse conditions in a hospital.'). Four answer categories ranged from 'strongly disagree' to 'strongly agree,' with each response category measured by a score from one to four points; all items were totalled and divided by the number of items.

#### Statistical methods

Due to a non normal distribution of the dependent variable, multiple logistic regression analysis was performed using SPSS 16.0. If the proportion of missing values for a respondent was >30%, that respondent was excluded from the analysis. If the proportion of missing values for a respondent was <30%, missing values were imputed by the expectation-maximization algorithm. The imputation was performed using the software NORM (Graham et al. 2003). The expectation-maximization algorithm estimates missing data using an iterative maximum likelihood estimation procedure. It is a widely recommended method for preventing biases caused by not totally random missing data (Allison 2001; Schafer and Graham 2002; Wirtz 2004). The analysis was conducted as described in the following: First, we give an overview of the socio-demographic characteristics of the study sample (Table 1). Second, we give an overview of the descriptive values and wordings of items used to build up dependent and independent scales (Table 2). We then show the distribution of 'tendency to excuse' (Fig. 1). Afterwards, we show the Pearson product moment correlation coefficients for correlations between Cologne Patient Questionnaire scales and socio-demographic and economic variables (Table 3). In the last step of analysis, we conducted a logistic regression with trust as dependent, and with age, gender, socio-economic status and Cologne Patient Questionnaire scales (informational and emotional support, shared decision-making and 'tendency to excuse') as independent variables (Table 4). Logistic regression coefficients were transformed into standardized effect coefficients. We produced the standardized effect coefficients by multiplying the unstandardized logit coefficients by the standard deviations of the corresponding variables, giving a result that can be used to rank the relative importance of the independent variables (Meyers et al. 2006).

The quality of the logistic regression models was assessed by Cox and Snell Pseudo- $R^2$ , Nagelkerke's Pseudo- $R^2$  and McFadden Pseudo- $R^2$ , which are considered to be the best proxies for the explained variance. Additionally, logistic regression models were controlled for interaction effects between sex and socio-economic status

**Table 1** Variable and value labels of socio-demographic and economic variables, Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000

Variable label	Value labels	<i>N</i>	%
Age	18–30 years	454	21.2
	31–65 years	1,177	55.0
	66–97 years	509	23.8
Gender	Male	1,583	73.7
	Female	577	26.3
School education	None	49	2.3
	Elementary school	940	44.6
	Secondary school	699	33.2
	Grammar school	369	17.5
	Other	49	2.3
Occupational position	Workers	407	19.7
	Employees	703	34.1
	Civil servants	579	28.1
	Self-employed	163	7.9
	Apprentice, school or university	110	5.3
	Other	101	4.9

on the one hand, and informational and emotional support and shared decision-making on the other hand.

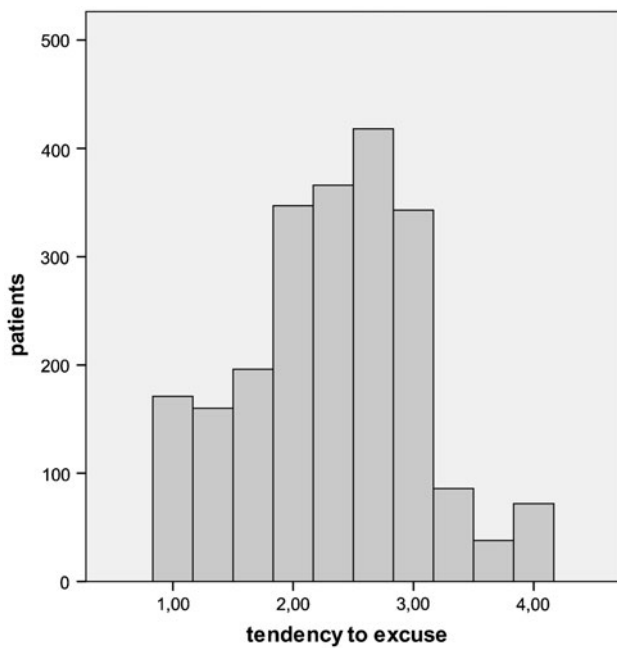
## Results

Two thousand one hundred and ninety-seven patients made up the sample in the present analysis. For those patients included in the analysis, a mean average of 4% missing values in the items of the Cologne Patient Questionnaire scales was observed. Missing values were imputed by the expectation–maximization algorithm only for these Cologne Patient Questionnaire scales. The participant's mean age was about 50 years (range 18–97 years), 55.0% of all patients ranged between 31 and 65 years; 26.3% of the respondents were females. For 44.6% of the respondents, the highest level of education was elementary school, for 33.2% of the respondents it was secondary school and for 17.5% of the respondents it was grammar school (high school). While 2.3% of the respondents had other schooling qualifications, a further 2.3% had none at all. The sample consisted of 19.7% workers, 34.1% salaried

**Table 2** Items, item wordings, number of patients (*n*), mean, standard deviation (sd), minimum and maximum (min/max) for Cologne Patient Questionnaire-scales: trust in physician\_short form, informational support, emotional support, shared decision-making

Item	Item wording	<i>n</i>	Mean	SD	Min	Max
Patient's evaluation of... <i>trust in physician_short form</i>						
tru1	I completely trusted my doctors	2,197	3.48	0.74	1	4
tru2	I had the impression that the doctors are very competent	2,197	3.52	0.66	1	4
tru3	With the doctors in this hospital one is in good hands	2,197	3.50	0.70	1	4
Patient's evaluation of... <i>emotional support...</i> of physician						
emo1	It was possible to talk with the doctors about personal matters	2,197	3.05	0.89	1	4
emo2	Doctors carried out regular conversations, which also took place outside of ward rounds	2,197	2.57	1.04	1	4
emo3	Doctors carried out conversations with me in a very empathetic manner	2,197	3.03	0.89	1	4
emo4	Doctors gave me time to think important decisions over	2,197	3.20	0.81	1	4
Patient's evaluation of... <i>informational support...</i> of physician						
inf1	Doctors used visual aids (pictures, drawings and outlines)	2,197	2.61	1.12	1	4
inf2	Doctors explained everything in a clear and understandable way	2,197	3.23	0.88	1	4
inf3	Doctors gave an illustrative picture of illness	2,197	3.20	0.92	1	4
Patient's evaluation of... <i>shared-decision-making behaviour...</i> of physician						
sdm1	My wishes were taken into account during treatment	2,197	3.20	0.80	1	4
sdm2	I was able to influence the treatment process	2,197	2.51	0.93	1	4
sdm3	Doctors wanted me to be actively involved in the treatment process	2,197	2.87	0.93	1	4
sdm4	Doctors agreed treatment targets with me	2,197	3.05	0.90	1	4
Patient's... <i>tendency to excuse</i>						
tex1	I am more willing to turn a blind eye in hospital than in everyday life	2,197	2.33	0.94	1	4
tex2	I am willing to overlook adverse conditions in hospital	2,197	2.07	0.86	1	4
tex3	If it is hectic and busy in hospital, one should excuse some things	2,197	2.59	0.86	1	4

and tendency to excuse, Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000



**Fig. 1** Distribution of 'tendency to excuse', 1 = low excuse, 4 = high excuse ( $n = 2,197$  patients), Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000

employees, 28.1% civil servants, 7.9% self-employed, 5.3% apprentices, school, or university students and 4.9% with another professional status. This information about educational level and occupational position was used to compute socio-economic status following guidelines set out by Helmert et al. (1993).

Table 1 shows variables, value labels and distribution of socio-demographic and economic variables.

Table 2 shows items, item wordings,  $n$ , mean, standard deviation, minimum and maximum for all items used to

build up the Cologne Patient Questionnaire scales. The Cronbach's alpha of the used subscales was satisfactorily ranged from 0.749 ('tendency to excuse') to 0.863 ('trust in physician\_short form').

Figure 1 represents the distribution of the variable 'tendency to excuse'. About 2/3 of patients show no conspicuous 'tendency to excuse' (mean value: 2.33; standard deviation: 0.7).

Table 3 presents the Pearson product moment correlation coefficients for correlations between all Cologne Patient Questionnaire scales and socio-demographic variables.

The variable 'trust in physician' showed a right-skewed non-normal distribution and was, for multivariate analysis purposes, divided by median split into a group with lower trust ( $n = 1,149$ ; 52.3%) and a group with higher trust ( $n = 1,048$ ; 47.7%; see Fig. 2).

The last analysis was computed with a two-step logistic regression model with 'trust in physician' as the dependent variable, and age, gender, socio-economic status, tendency to excuse, emotional support, informational support and shared decision-making as independent variables. In the first step, only socio-demographic control variables (age and gender), socio-economic status and 'tendency to excuse' were introduced in the model. In the second step, emotional support, informational support and shared decision-making were introduced (Table 4).

In the first logistic regression significant indicators of trust in a physician are in order of the size of their effect (age, standardized effect coefficient = 1.37,  $p < 0.001$ ; socio-economic status, standardized effect coefficient = 1.14,  $p = 0.008$ ). The specificity of the model was 65.5% and the sensitivity of the model was 49.8%. The model accounted for nearly 5% of the variance of the dependent variable following Nagelkerke's Pseudo- $R^2$ . In the second logistic

**Table 3** Pearson product moment correlation coefficients for correlations between all Cologne Patient Questionnaire-scales and socio-demographic variables, Cologne Patient Questionnaire—development

	Age	Gender	Socio-economic status	Tendency to excuse	Emotional support	Informational support	Shared decision-making	Trust in physician_short form
Age	1							
Gender	0.220**	1						
Socio-economic status	-0.268**	-0.203**	1					
Tendency to excuse	0.109**	0.081**	-0.120**	1				
Emotional support	0.186**	-0.020	-0.097**	0.060**	1			
Informational support	0.076**	-0.017	0.009	-0.010	0.527**	1		
Shared decision-making	0.116**	-0.050*	-0.002	0.029	0.617**	0.514**	1	
Trust in physician_short form	0.136**	0.047*	-0.106**	0.041	0.579**	0.435**	0.443**	1

Significance level: \*  $p < 0.05$ , \*\*  $p < 0.01$

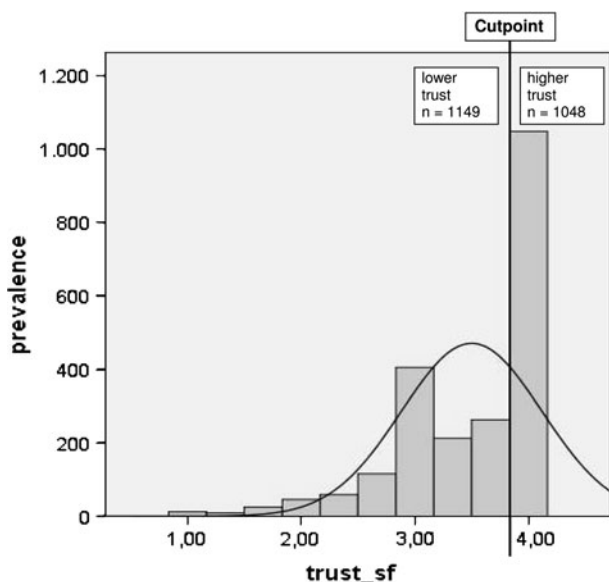
and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000

**Table 4** Results of logistic regressions with “trust in physician\_short form” as a dependent variable, and age, gender, socio-economic status, tendency to excuse, emotional support, informational support

and shared decision-making as independent variables, Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000

Independent variable	Regression coefficient	Standard error	Significance ( <i>p</i> values)	Stand. effect coefficient
First logistic regression model				
Age	0.017	0.003	<0.001	1.37
Gender	−0.007	0.108	0.952	1.00*
Socio-economic status	−0.048	0.018	0.008	1.14*
Tendency to excuse	0.024	0.064	0.703	1.02
Cox and Snell Pseudo- $R^2$	0.034			
Nagelkerke's Pseudo- $R^2$	0.045			
Mc Fadden Pseudo- $R^2$	0.025			
Second logistic regression model				
Age	0.007	0.003	0.027	1.14
Gender	−0.311	0.141	0.027	1.15*
Socio-economic status	−0.052	0.023	0.022	1.15*
Tendency to excuse	0.047	0.084	0.575	1.03
Emotional support	1.72	0.116	<0.001	3.65
Informational support	0.647	0.086	<0.001	1.70
Shared decision-making	0.479	0.108	<0.001	1.40
Cox and Snell Pseudo- $R^2$	0.368			
Nagelkerke's Pseudo- $R^2$	0.491			
Mc Fadden Pseudo- $R^2$	0.331			

\* Inverted effect coefficient



**Fig. 2** Distribution and median split (‘lower trust’ versus ‘higher trust’) of ‘trust in physician\_short form’, Cologne Patient Questionnaire—development and validation of a questionnaire to measure involvement of patients in care, Cologne, 2000

regression, significant indicators of trust in a physician are in order of the size of their effect: emotional support, standardized effect coefficient = 3.65,  $p < 0.001$ ;

informational support, standardized effect coefficient = 1.70,  $p < 0.001$ ; shared decision-making, standardized effect coefficient = 1.40,  $p < 0.001$ ; socio-economic status, standardized effect coefficient = 1.15,  $p = 0.022$ ; gender, standardized effect coefficient = 1.15,  $p = 0.027$  and age, standardized effect coefficient = 1.14,  $p = 0.027$ . The specificity of the model was 79.5% and the sensitivity of the model was 76.0%. The model now accounted for nearly 50% of the variance of the dependent variable following Nagelkerke's Pseudo- $R^2$ .

Additionally, logistic regression models were controlled for interaction effects between sex and socio-economic status on the one hand, and informational and emotional support and shared decision-making on the other hand, but no relevant changes in significance of original independent variables were found (results not included in Table 4).

## Discussion

With the results of our regression analysis, we were able to show that social support and shared decision-making behaviour of physicians, socio-economic status, age and gender were significantly related to inpatient's trust. To measure trust a 3-item-short-form-scale was used which does not comprise every dimension of trust which are

discussed at this time (Mechanic and Meyer 2000). This short-form-scale is more a general subjectively overall impression of the patient regarding his or her trust to the physician. Reliability (Cronbach's alpha) is from our point of view very high with a count about 0.863. In a first step, we only introduced age, gender and socio-economic status with a relatively poor amount of explained variance and found, in concordance with other studies, that higher age and lower socio-economic status were significantly related to higher trust (Kraetschmer et al. 2004). In a second step, we introduced aspects of interaction, such as emotional support, informational support and shared decision-making.

Examining other studies we found that patient trust is largely build on doctor's interpersonal competence (Mechanic and Meyer 2000; Thom and Campbell 1997). Patients who had the impression that it was possible to talk with the physicians about personal matters and to carry out these conversations in a regular and empathic manner outside the ward rounds, and who had time to think about important decisions, expressed significantly more trust. Patients, who had the impression that physicians explained everything in a clear and understandable way using visual aids such as pictures, drawings and outlines to give an illustrative picture of illness, expressed significantly more trust. Patients, who felt actively involved in the treatment process with their wishes taken into account, who experienced the possibility of influencing the treatment process and of coming to mutual agreement with physicians about treatment targets expressed significantly more trust.

The current analysis was in concordance with other studies involving significant relationships between socio-demographic variables and trust (Fiscella et al. 2004; Thom 2001). Older patients, patients with low socio-economic status and female patients expressed significantly more trust. The role of gender in our analysis was interesting because gender becomes significant when shared decision-making and social support are controlled for. Correlation analysis has demonstrated a significant correlation between gender and shared decision-making, with women feeling less participation in treatment, whereas no significant relationships between social support and gender were found. This effect is often referred to as 'suppressed correlation'. From our viewpoint, this result hints at gender aspects within the physician-patient interaction, with a significant perception among women that they are not integrated enough in treatment decisions. A closer look at possible interaction effects between gender and social support or shared decision-making showed no significant results.

Pearson's product-moment correlations show that there is a significant tendency among older patients, women and patients with low socio-economic status to excuse mistakes and inconvenience during a hospital stay. Concurrently,

there is no significant relationship between informational support, shared decision-making, trust and 'tendency to excuse'. The consistent patterns of positive correlations between variables (and the significant associations between independent and dependent variables) are therefore, from our point of view, not related to a tendency of respondents to be 'yeah-sayers' or 'nay-sayers', to give socially desired answers or to excuse (Perneger 2004). Furthermore, about two-thirds of patients show no conspicuous 'tendency to excuse' to any extent. Also, we found no significant relationship between socio-economic status of patients and shared decision-making behaviour of physician.

#### Limitations of the study

In comparison with the German population as a whole, the study sample represents a rather low socio-economic population (Statistical Yearbook 2008 for the Federal Republic of Germany). However, this does not seem to weaken the generalizability of our results. People with a low socio-economic status suffer from significantly increased morbidity (Marmot 2006). It seems to be obvious that this will lead to social disparities in the risk of hospital admission and length of stay (Icks et al. 2007).

We did not include any questions concerning race or ethnicity but did have a question about nationality. The sample consisted of 95% patients with German nationality and about 5% patients thus did not hold German nationality. The latter had to have at least sufficient German language skills to fill out the questionnaire. The population of analysis of the present study is a mixed group of patients of surgery ward and internal medicine. Exact definitions of kind and severity of illness cannot be given because of not being drawn.

The purposive sampling of the six hospitals is non-probability and hence can be subject to bias and error. Another limitation might be that two of the six hospitals were German army hospitals which led to the unusually high proportion of men in the study population. The possible effect of this bias might be weakened by introducing gender as an independent variable in the logistic regression model.

This study was not designed to assess a causal or predictive relationship between social support and trust. To do so, an experimental study design would have been the right choice. Another problem is the so-called common method variance. This is a type of shared variance between two or more variables which is considered to be due to particular methods of data gathering, for instance, if the data source involves self-reports. This level of bias is a real cause for concern, but does not invalidate research findings in general (Doty and Glick 1998). A possible solution in future studies could be to observe correlations between different

indicators of the same construct using different methods by triangulation of quantitative and qualitative research.

A further problem is that, in our study, informational and emotional support was measured at the same time with trust. To deal with this limitation, one possible solution might be to gather data at different points in time. The results may only be transferred with caution to the situation of other patients, e.g. in primary care. A further restriction is that characteristics relating to the physicians, such as age, gender and physician's attire (Cooper-Patrick et al. 1999; Laveist and Nuru-Jeter 2002; Rehman et al. 2005) or personality (Duberstein et al. 2007) were not included in the study. It seems to be possible that patients' attitudes towards physicians' attire or personality may have an impact on patient trust.

### Practical implications

The results of this study confirm that social support and shared decision-making are essential factors for a trustful physician–patient relationship. Specifically, the provision of information and adequate time for discussion as well as the involvement of the patient in treatment form the basis for a trusting relationship between the physician and the patient. The results underline the importance of psychosocial skills in medical education and training. The positive effects of communication skills training have already been reviewed by (Zimmermann et al. 2007).

Medical education should integrate sound knowledge about psychosocial aspects of the physician–patient interaction to effectively promote emotional and informational support and shared decision-making in order to establish and maintain a patient's trust in their physician.

**Conflict of interest** The authors declare that they have no competing interest.

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