

## Communication: Perception and Recall

The impact of financial incentives on physician empathy: A study from the perspective of patients with private and statutory health insurance<sup>☆</sup>

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## ABSTRACT

**Objective:** We hypothesized that patients' ratings of physician empathy (PE) would be higher among those with private health insurance (PHI, referring to financial incentive) than among patients with statutory health insurance (SHI).

**Methods:** A postal survey was administered to 710 cancer patients. PE was assessed using the Consultation-and-Relational-Empathy measure. *T*-tests were conducted to analyse whether PHI and SHI-patients differ in their ratings of PE and variables relating to contact time with the physician. Structural-equation-modelling (SEM) verified mediating effects.

**Results:** PHI-patients rated physician empathy higher. SEM revealed that PHI-status has a strong significant effect on frequency of talking with the physician, which has a strong significant effect (1) on PE and (2) has a moderate effect on patients' perception of medical staff stress, thereby also affecting patients' ratings of PE.

**Conclusions:** Our findings suggest that PHI-status is one necessary precondition for physicians spending more time with the patient. Spending more time with the PHI-patient has two major effects: it results in a more positive perception of PE and positively impacts PHI-patients' perception of medical staff stress, which in turn, again influences PE.

**Practical implications:** Health policy should discuss these findings in terms of equality in receiving high-quality care.

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## 1. Introduction

One essential prerequisite for successful patient-centred consultation [1] in clinical settings is the physician's empathy

[e.g. 2–11]. One definition of physician empathy is the “socio-emotional competence of a physician to be able to understand the patient's situation, perspective and feelings, to communicate that understanding and check its accuracy, and to act on that understanding with the patient in a helpful (therapeutic) way” [12, p. S1].

Although physician empathy is assumed to improve physical [13] and psychosocial health outcomes [9–11], little is known about how to motivate physicians to be empathic [11]. As financial incentives are a fundamental staff motivator [14,15], we aim to explore their contribution in clinical settings; namely, whether financial incentives can modify physicians' empathic behaviour. Financial incentives referred to treating patients with private health insurance (abbreviated as PHI; equivalent to “fee-for-service”), as physicians can charge more for benefits and/or higher

<sup>☆</sup> We confirm that all patient/personal identifiers have been removed or disguised to ensure anonymity of all patients/persons described.

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fees in PHI than in statutory health insurance (abbreviated as SHI, equivalent to “capitation”) (compare Section 1.3).

Hence, the aim of this inquiry was to study the influence of health insurance type on physicians' empathic behaviour from the patients' perspective; in particular, if variables relating to contact time with the physician might play a mediating role in this relationship.

### 1.1. Theoretical background

The theoretical background of our inquiry draws closely on the “Conceptual framework of influences on health worker motivation” developed by Franco et al. [15] (see Fig. 1). In their in-depth research into health worker motivation [15,16] they assumed that work motivation is not an individual or organisational attribute, but results from the interaction between individuals and their work environment. Thus, local organisational and broader sector policies can potentially affect health workers' motivation, either positively or negatively [16]. Consequently, we can assume a relationship between current health policies and health worker motivation. Namely, provider payment mechanisms (e.g. PHI or SHI) can have intended and unintended effects on health worker motivation [15,16].

Moreover, economic theory and common sense both suggest that payment methods can affect people's working patterns [17,18].

### 1.2. Empirical background

Empirical background for this study is previous research, which found that patients are more satisfied with healthcare in private practice [19–24]. Further, PHI-patients' perceptions of their relationship and communication with physicians were better than SHI-patients [25–27]. Likewise, Kao et al. [28] showed that patients reported greater trust in their physician in private health plans. Sturm et al. [29] showed that patients with current depressive disorders in prepaid plans switched providers or ended relationships with their providers significantly earlier than patients in fee-for-service plans.

Conversely, a Dutch study comparing fee-for-service with fixed salary plans found that physicians on fixed salaries provided longer visits, more information and advice, and greater empathy [30]. Gosden et al. [31] also showed salary payment to be associated with longer consultations and more preventive care. However, fee-for-service resulted in greater continuity of care [31,32].

### 1.3. Study context: reimbursement of German hospitals and the role of health insurance in the German hospital sector

Due to the regulatory framework of health insurance in Germany, reimbursement schemes of hospitals differ by insurance type. PHI is available only to some segments of the population (ca. 20%), namely civil servants, the self-employed, and individuals with an annual income above 48,150€. However, only 10% choose this option. About >89% are covered by compulsory SHI [33]. Both types of insurance cover hospital fees. Nevertheless, hospitals can generate additional remuneration by treating PHI-holders. These are “hotel-benefits” (private rooms), costlier treatment by the chief physician, and access to innovative and costly treatment methods not available in basic SHI. However, SHI-holders have the option to purchase private supplementary health insurance (PSHI) to cover “hotel-benefits” and treatment by the chief physician. Conversely, access to innovative and costly treatment methods are not covered by PSHI. Currently 5.1 million (7.1%) of those with SHI chose this option [33].

In 2006, all additional remuneration for these private elective services amounted to 2.5 billion euro or 4% of the total hospital revenues. On average, approximately 47% of the inpatient services are dependent on insurance status leading to higher revenues for PHI-patients compared to SHI-patients. Thus, a clear financial incentive exists to privilege PHI-holders over SHI-holders.

This financial incentive to privilege PHI-holders is strengthened by two further aspects: first, PHI-holders are more sensitive towards high-quality treatment than SHI-holders [34,35]. Second, the way German hospitals settle fees differentiates between both insurance types: for SHI-holders, hospitals charge for diagnostic tests, treatment and drugs directly through the insurance provider.

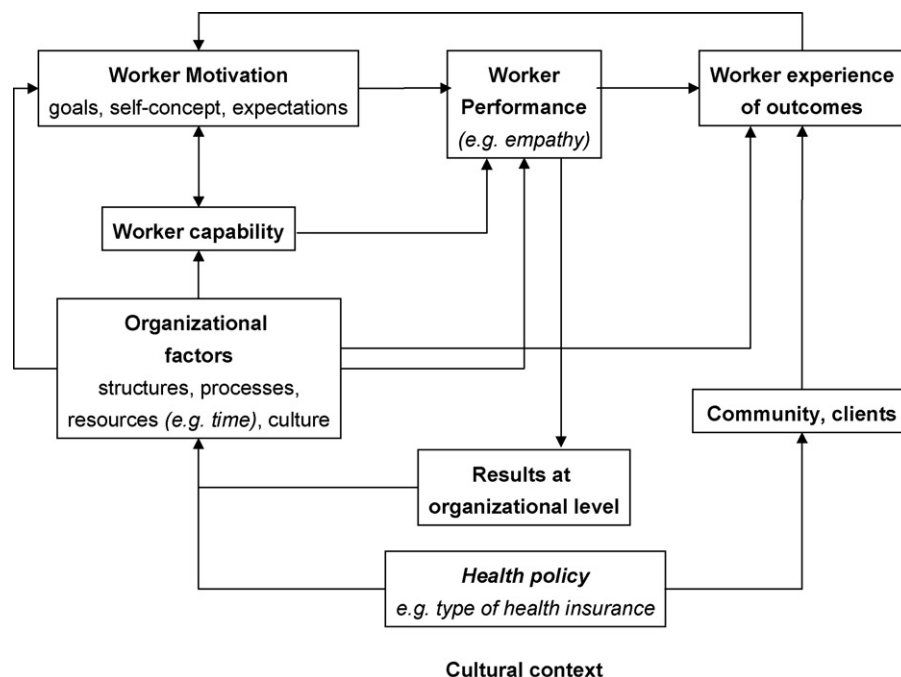


Fig. 1. Conceptual framework of health worker motivation (drawing closely on Franco et al. [15]; words in italics were changed or added; the term in the original was “Health Sector Reform” instead of “Health policy”).

For PHI-holders, however, services such as treatment by the chief physician are charged directly by the treating physicians leading to higher revenues for themselves and their staff.

In short, several arguments can explain the financial interest of hospital management and treating physicians to privilege PHI-holders over SHI-holders: high cost pressure in the German hospital sector, additional income sources for hospitals and physicians to treat PHI-patients and PHI-patients' higher sensitivity towards quality of treatment.

#### 1.4. Hypotheses

Based on Sections 1.2 and 1.3, we hypothesized that PHI-patients rated physician empathy higher than patients with SHI.

Based on the “*Conceptual framework of health worker motivation*” (Fig. 1), we also assumed that the type of health insurance indirectly affects physician empathy, and variables relating to contact time with the physician might play a mediating role [36].

As a secondary hypothesis, we controlled for potential socio-demographic confounders by including variables such as age and gender. We also examined as a secondary hypothesis whether patients with higher social status reported higher empathy values, i.e. patients with high school education, university degree and/or higher occupational status, which generally apply to PHI-patients. This hypothesis refers to studies showing that similarity and familiarity evoke, or at least positively influence, empathy [37–42].

## 2. Methods

### 2.1. Study design and ethics

This was a retrospective study with cancer patients diagnosed with bronchial, oesophageal, colorectal, breast, prostate and skin cancer. Patients with one of these diagnoses and between 18 and 75 years of age were eligible for participation. A questionnaire was sent to 710 cancer patients, who had been inpatients at the University Hospital Cologne between February and August 2005. The completely anonymous postal survey was conducted between September and November 2005. The Total-Design-Method [43–45] was used, with three survey waves, producing a net return rate of 49.5% ( $n = 326$ ). Of those, three respondents (0.9%) were excluded due to limited data quality (missing values >30% in scale items).

The study was reviewed and approved by the Ethics Committee of the Medical Faculty of the University of Cologne and by the Data Protection Authority in North-Rhine Westphalia.

### 2.2. Measures

#### 2.2.1. Physician empathy

Physician empathy was assessed using the German version [46] of the widely used Scottish Consultation-and-Relational-Empathy measure (CARE) [10,47,48]. The one-dimensional CARE measure comprises 10 items (see [http://www.gla.ac.uk/media/media\\_65353\\_en.doc](http://www.gla.ac.uk/media/media_65353_en.doc)) relating to patients' perception of physicians' understanding of and response to their concerns and fears. In our study, the 10 items of the CARE measure were introduced with the following sentence: “*How did the physician primarily responsible for your treatment at this University Hospital behave in general?*”. Patients could rate the 10 items on a 5-point scale from 1 (“completely”) to 5 (“not at all”). The psychometric properties of the German version of the CARE measure are very satisfactory and reported elsewhere [9,46].

#### 2.2.2. Type of health insurance

We asked patients: “*What kind of health insurance do you have?*” Possible answer categories were statutory health insurance (SHI),

private health insurance (PHI), statutory health insurance plus private supplementary health insurance (PSHI) or “other (e.g. insured by employment office)”. As PHI- and PSHI-patients do not have the same status and receive not the same treatment in hospital (compare Section 1.4), they were not put in one group for data analysis.

#### 2.2.3. Cancer patients' socio-demographic characteristics

We also asked patients about their age, gender and education level. We dichotomised the sample into those with high school education and without high school diploma (required for university) and again for those with and without a university degree. We also assessed participants' occupational status. Blue-collar workers represented the lower occupational status group and white-collar workers (employees), civil servants, self-employed persons and academics working as freelancers represented higher occupational status.

#### 2.2.4. Variables referring to contact time with the physician

Cancer patients were interviewed about their subjective perception of time-related physician behaviours:

- “*How often did you talk with the physician primarily responsible for your treatment at this University Hospital, during your stay in hospital?*” (answer categories: “hardly ever”, “several times, but not regularly”, “once a day” or “several times a day”) and
- “*How long was your average consultation with the physician primarily responsible for your treatment at this University Hospital?*” (answer categories: “less than five minutes”, “five to 10 minutes”, “10 to 15 minutes”, “15 to 30 minutes”, “30 to 60 minutes” and “more than 60 minutes”).

To assess “*medical staff stress*”, we utilised one subscale from the widely used Cologne Patient Questionnaire [49–52] including three items, which patients could answer on a 4-point scale from 1 (“completely disagree”) to 4 (“completely agree”): (1) “*The hospital was busy*”; (2) “*The medical staff was pushed for time*”; (3) “*The medical staff appeared stressed*”.

### 2.3. Data analysis

For the 323 patients included in analysis, a total of 23 (7.6%) missing values in the scale items were observed. Prior to the main data analyses, these missing values were imputed by the expectation-maximisation (EM) algorithm. The EM algorithm estimates missing data using an iterative maximum-likelihood estimation procedure. This is one of the recommended methods for preventing biases caused by not completely random missing data processes [53,54]. The imputation was performed using NORM software [55].

For all statistics, except for the Structural-Equation-Modeling (SEM), SPSS 17.0 was used. Based on our hypothesis (Section 1.4), we first conducted *t*-tests to analyse (1) whether PHI- and SHI-patients differ in their subjective perception of physician empathy, and, if so, (2) whether this subjective perception was confounded by the hypothesised socio-demographic characteristics and social status of cancer patients.

Second, the two insurance groups were investigated regarding differences in variables referring to contact time with the physician (Section 2.2.4). Here, we also used *t*-tests.

Finally, we applied SEM to verify possible mediating effects of contact time variables (see Section 2.2.4) and confounding effects of socio-demographic and social status variables (see Section 2.2.3) [56]. Due to the ordinal measurement level of some variables, the analysis was conducted using polychoric correlations [57]. In addition, robust weighted least squares (WLS) with the mean- and

variance-adjusted  $\chi^2$  algorithm were applied using Mplus Version 4.21 [58].

In accordance with Kline [59], a two-step SEM procedure was applied. In the first SEM step, a confirmatory factor analysis (CFA) was conducted to determine whether the intended constructs were indeed measured. The appropriateness of a specific CFA model was assessed by global fit measures.

Measures of global fit indicate whether the empirical associations among the manifest variables are appropriately reproduced by the model [59,60]. For a variety of these global fit measures, certain criteria have to be met for accepting the model under study as plausible and parsimonious. Measures of absolute fit, such as the Root Mean Square Error of Approximation (RMSEA) can be interpreted as the amount of information within the empirical covariance matrix that cannot be explained by the proposed model. Furthermore, measures of incremental fit were employed [61]: the Comparative Fit Index (CFI) and the Tucker–Lewis index (TLI).

In the second SEM step, we specified a measurement model and two path models, as implied by the results of the first step of our analysis, and evaluated it using global fit measures. In the first path model, we tested only the direct path from “PHI or SHI” to “CARE”. In the mediated path model, we included the mediator variables referring to contact time with the physician—except of “average length of consultation” because of its skewed distribution (see Table 5)—to compare all models, thereby gaining evidence for mediating effects. The significance of the relationships between the exogenous and endogenous latent variables as well as the amount of variance explained in the endogenous variables was examined.

In the last step, we also controlled for possible confounding effects of the socio-demographic and social status variables. That is to say, we verified if the relationships in our structural model changed based on the amount of another variable added to the model [36,56]. Multi-group SEM is used to test moderating effects [56]. In this study, a multi-group SEM model was conducted with Mplus Version 4.21 [58].

### 3. Results

#### 3.1. Cancer patients' characteristics

Participants' mean age was 58.7 years (SD = 11.2; range = 19–76) with 64.5% of patients over 50 years. Almost half (47.7%) were women; 78.6% lived with a partner, and of those, 69.4% were married. High school was the highest education level reached by 32.2% of participants.

Disease-specific characteristics of this sample are reported in Table 1. Table 2 shows the distribution of the different types of health insurance. Compared with SHI-patients, PHI-patients had better schooling, more academic degrees, higher occupational status and better global quality of life (see Table 3).

**Table 3**

Characteristics of respondents regarding their health insurance status.

	Statutory health insurance (SHI) N (%)	Private health insurance (PHI) N (%)	SHI plus private supplementary health insurance N (%)	p-Value
Female	107 (49.3)	28 (51.9)	26 (65)	0.190
Age, mean	59	57	60	0.555
High school education	52 (25.2)	32 (59.3)	19 (47.5)	0.000
Academic degree	36 (17.9)	28 (52.8)	10 (27)	0.000
Blue-collar workers	64 (29.5)	2 (3.7)	2 (5)	0.000
Duration of hospital stay: more than 10 days	107 (50.5)	20 (37)	16 (41)	0.156
No secondary diseases	93 (42.9)	30 (56.6)	20 (50)	0.174
Cancer stage: initial diagnosis	125 (66.7)	38 (74.5)	28 (71.8)	0.513
Global QoL <sup>a</sup> , mean	9.27	10.37	9.63	0.038

<sup>a</sup> Global Quality of life (QoL) was assessed with item number 30 of the EORTC questionnaire called “global health status” [64].

**Table 1**

Disease-specific characteristics of the sample (N = 323).

Type of cancer diagnosis	N	%	
Bronchial	28	8.7	
Colorectal	18	5.6	
Prostate	54	16.7	
Oesophageal	35	10.8	
Breast	109	33.7	
Skin	68	21.1	
Other	7	2.2	
Missing	4	1.2	
Cancer stage	N	%	
Initial diagnosis	199	61.6	
Relapse	29	9.0	
Second tumour	36	11.1	
Relapse and second tumour	17	5.2	
Don't know which cancer stage	27	8.4	
Other cancer stage	8	2.5	
Missing	7	2.2	
Therapy/treatment	N	%	
Surgical	283	87.6	
Chemo	143	44.3	
Radio	148	45.8	
Pain	24	7.4	
Antihormone	61	18.9	
Antibodies	6	1.9	
Complementary	17	5.3	
No therapy ("wait and see")	18	5.6	
Other	25	7.7	
Missing	–	–	
Time since diagnosis	M	Range	SD
Months	22.1	1–309	44.8

Note: M = mean, SD = standard deviation.

**Table 2**

Type of health insurance (N = 323).

Type of health insurance	N	%
Statutory health insurance (SHI)	211	65
Private health insurance (PHI)	71	22
SHI plus private supplementary health insurance (PSHI)	41	13
Other (e.g. insured by employment office)	0	0

#### 3.2. t-Tests

Table 4 shows that PHI-patients rated physicians' empathy significantly higher than SHI-patients. Female cancer patients also reported significantly higher values of physicians' empathy higher than male patients. Contrary to our hypothesis, patients of lower social status did not differ in their rating of physician empathy (see Table 4, rows 3–5). Thus, the aforementioned relationship between

**Table 4**

*t*-Tests with physician empathy as dependent variable, lower values show higher empathy.

Variable	Group (N)	Mean CARE-score	Levene's test for equality of variances		<i>p</i> -Value (2-tailed)	95% confidence interval	
			<i>F</i>	<i>p</i>		Lower limit	Higher limit
Type of health insurance	SHI (211) PHI (71)	2.39 1.87	5.269	0.022	0.001	−0.816	−0.213
School education	Higher (103) Lower (201)	2.14 2.31	0.988	0.321	0.187	−0.865	0.437
Academic degree	Yes (74) No (218)	2.15 2.31	1.495	0.222	0.289	−0.135	0.453
Occupational status	Higher (254) Lower (69)	2.26 2.39	0.427	0.517	0.388	−0.166	0.428
Age	<60 (129) >60 (134)	2.15 2.28	1.701	0.193	0.336	−0.132	0.387
Sex	Female (167) Male (156)	2.13 2.46	1.299	0.255	0.014	−0.548	−0.062

Note: CARE-score = 10 items of the physician empathy measure (see Section 2.2.1) added up and divided by 10.

**Table 5**

*t*-Tests with type of health insurance as dependent variable (PHI: *N* = 71, SHI: *N* = 211).

Variables	Group	Mean	Levene's test for equality of variances		<i>p</i> -Value (2-tailed)	95% confidence interval	
			<i>F</i>	<i>p</i>		Lower limit	Higher limit
Frequency of talking with physician	SHI PHI	2.28 2.81	0.877	0.350	0.000	0.288	0.768
Average length of consultation with physician <sup>a</sup>	SHI PHI	2.65 2.32	–	–	0.334	–	–
Medical staff stress	SHI PHI	2.51 2.37	9.931	0.002	0.170	−0.340	0.061

<sup>a</sup> Here the Kruskal–Wallis test was used because of the skewed distribution of the variable.

type of health insurance and physician empathy was confounded only by gender, but not by the hypothesized social status, although patients with PHI had significantly better schooling, more academic degrees, and higher occupational status (see Table 3).

Results in Table 5 demonstrate that PHI-patients reported talking significantly more frequently with their physician during their stay in hospital, although the average length of each consultation was not longer. In other words, this result indicates that the amount of time a physician spent with a PHI-patient is in total more, because he/she saw these patients more frequently than SHI-patients. Conversely, physicians did not spend more time in each single consultation with PHI-patients.

### 3.3. SEM and mediator analysis

We conducted a CFA with the model in Fig. 2 resulting in a very good global data fit (see Table 6, “measurement model (CFA)”) with very good factor loadings (see Fig. 2). These measurement indicators show a reliable estimation of all constructs. The excellent CFI, TLI and RMSEA values indicate a very good model fit (see Table 6). Furthermore, the one-dimensional structure of the CARE measure

could be replicated, but the error term correlation of items 4 and 5, as well as 9 and 10 [9,10,46] did not necessary exist in this model.

After ensuring a satisfactory measurement quality, structural relationships between variables were specified, as implied by our hypotheses. The two path models (see Table 6) yielded virtually the same measures of global fit as the “CFA model”, demonstrating that the model structures were in accordance with the empirical data.

Testing the first path model (see Table 6 “path model: PHI or SHI → CARE”), a very good model fit was reached (see Table 6). Fig. 2 illustrates the “mediated path model”, indicating estimated significant path coefficients and the percentage of explained variances for the endogenous structural variables. The mediated path model (see Table 6) demonstrates that PHI has a significant strong effect on frequency of talking with the physician, which in turn

- (1) has a strong significant effect on the quality of subjectively perceived physician empathy (see Fig. 2) and
- (2) has also a moderate significant effect of patients' perception of medical staff stress, in turn, again moderately influencing patients' rating of physician empathy (see Fig. 2).

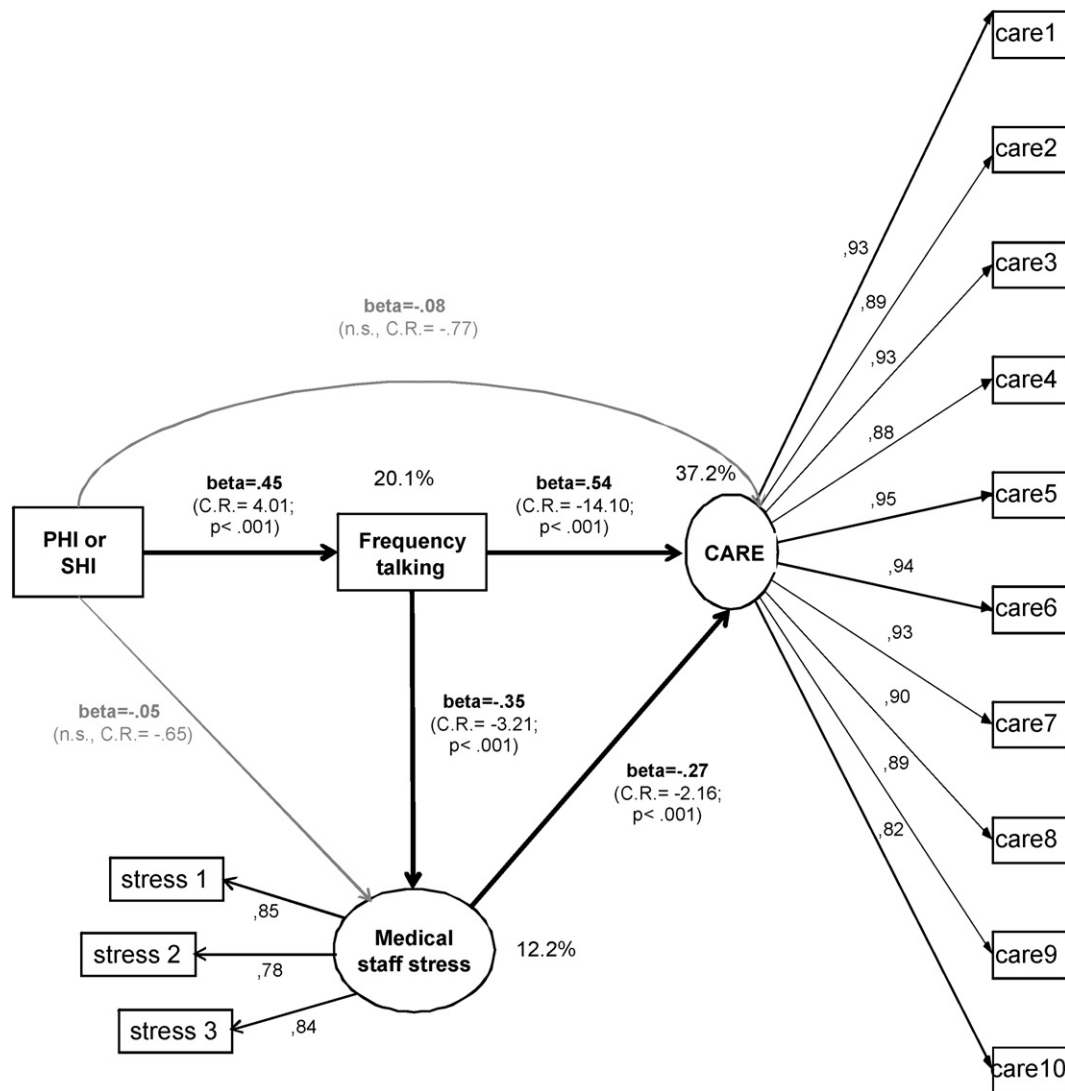
**Table 6**

Measures of global fit for all models estimated.

	$\chi^2$	df	<i>p</i>	$\chi^2/df$	TLI	CFI	RMSEA
Thresholds of acceptable fit			>.05	<2	≥.95	≥.95	≤.070
Measurement model (CFA)	99.57	52	<.001	3.11	1.00	.99	.062
Path model: PHI or SHI → CARE (grey path Fig. 2)	93.39	47	<.001	3.46	1.00	.99	.062
Mediated path model (see Fig. 2)	68.56	51	<.001	2.21	1.00	.99	.062

Note: TLI = Tucker–Lewis Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation. For thresholds of acceptable fit see [56,65].





**Fig. 2.** Mediated path model: estimated path coefficients and percentage of explained variance for the endogenous structural constructs. Note: “PHI or SHI” = type of health insurance, i.e. private health insurance or statutory health insurance; “frequency talking” = frequency of talking with physician; CARE = Consultation-and-Relational-Empathy measure, i.e. subjectively perceived physician empathy.

To test the mediating effects of the two contact time variables, we put direct paths from “PHI or SHI” to “CARE” and from “PHI or SHI” to “medical staff stress” in this mediated path model, which were no longer significant (see Fig. 2, grey paths). Thus, the direct paths from “PHI or SHI” to “CARE” and from “PHI or SHI” to “medical staff stress” could be eliminated from the structural model without losing any systematic information. Therefore, our hypothesis that PHI has an indirect effect on physician empathy via mediating variables referring to contact time with the physician could be verified.

Last, we specified patients' gender as a confounding variable and conducted a multi-group analysis to verify a possible confounding effect. The result was that there were no group differences (overall model:  $df = 2$ ,  $CMIN = 0.666$ ,  $p = 0.700$ ) between male and female cancer patients that affect the direction and/or strength of the relationship between the variables in the model.

#### 4. Discussion and conclusion

##### 4.1. Discussion

Our findings suggest that PHI-status is one necessary precondition for physicians spending more time with the patient.

Spending more time with the PHI-patient has two major effects: it results in a more positive perception of physician empathy and positively impacts PHI-patients' perception of medical staff stress and positively influences physician empathy. These results seem to support the investigated parts of the “Conceptual model of health worker motivation” [15] (see Fig. 1) and most of the aforementioned empirical studies (see Section 1.2): we can speculate that if patients' PHI-status gives the hospitals and physicians the opportunity to charge more, this indirectly impacts their motivation to empathise (see Fig. 1) via mediating variables that reflect devoting more time to patients and being less stressed as a physician.

The mediating effect of spending more time with the patient is in line with Kao et al. [28], who examined the relationship between physician payment method and patient trust: patients' reports of physician behaviour accounted for part of the variation in patients' trust in physicians who were paid differently. The authors concluded that the impact of payment methods on patient trust might be mediated partly by physician behaviour. They found that differences in trust by payment method were reduced when the Picker Score, comprising time-related items of physician behaviour, was included in the regression analysis [28].

The influence of patients' perception of medical staff stress on physician empathy was also found in a former study of Neumann and colleagues with the same sample of cancer patients [9]. However, the impact of PHI-status as one precondition for spending more time with the patient, thereby influencing patients' perception of medical staff stress is a new relationship that was found according to the "Conceptual framework of health worker motivation" by Franco et al. [15]. Nevertheless, Braddock and colleagues [62] also discussed this issue: "In terms of adverse effects of time pressure, the physician [...] may exhibit signs of stress or annoyance that, while not directed at the patient, can nonetheless be perceived so. Patients may question whether the physician really cares if the physician seems annoyed, rushed, or inattentive." (p. 1059).

Applying our findings on a societal level raises questions of equality of opportunity to receive high-quality patient-centred care. It seems that higher income patients receive more time with their physician, and, consequently, more empathy. These questions of social inequality are even more crucial because physician empathy is a determinant for better health outcomes (see Section 1) and the Institute of Medicine (IOM) classifies patient-centred care as one of six central targets for health systems in the 21st century, by the following definition: "...qualities of compassion, empathy, and responsiveness to the needs, values, and expressed preferences of the individual patient" [1, p. 48]. In other words, patients deserve sensitivity to their needs, regardless of whether their health insurance provider is private or state-regulated [25]. Therefore, the impact of time and money seems to be one important factor in patients' rating of physician empathy that requires intense discussion in healthcare policy.

#### 4.2. Strengths and limitations of this study

Our study has several important strengths. The hypothesis was based on theory: on the "Conceptual framework of health worker motivation" (Fig. 1) and on previous empirical findings (see Section 1.2). Furthermore, our results were controlled for important confounding variables (see Section 3.3). Moreover, this study is one of the few examining provider payment as a determinant for quality of care in the patient–physician relationship, especially for physician empathy.

Regarding the study design, it is noteworthy that participants were blinded to any specific study hypothesis, and all analysed variables were not mentioned in the survey cover letter. Although the quality of retrospective studies is not necessarily high, and randomised controlled trials (RCTs) are the most rigorous type of study design, two main reasons can explain their impracticability in this research area. First, few physicians would be willing to participate in RCTs where their income was randomly determined. Second, it would be impossible to blind the physicians as to their payment method [17]. Furthermore, a prospective study design would not constitute a genuine improvement, because health insurance type is a fixed variable, and combined with our theoretical background, we can assume high evidence of the supposed direction of causality in our model (see Fig. 2) [56].

However, we are aware of various study limitations. First, although patients were asked to focus on the physician primarily responsible for their treatment at the University Hospital Cologne, we knew neither which specific physician and consultation experiences were recalled, nor if patients' recall was accurate. Face-to-face interviews during hospital stay would possibly improve their recall, but would simultaneously increase the chance of social desirability bias.

Second, the cross-sectional design, as well as the postal survey form, might lead to a biased selection of cancer patients. A non-responder analysis could not be conducted due to the need to preserve participant anonymity.

Third, including only one hospital in our study limits the scope for generalizing the findings to other hospitals in Germany, because other hospitals might have a different policy concerning the way they treat PHI- and SHI-patients.

Fourth, as 22% of our cancer patients had a PHI, we have to admit a selection bias. It might be that these patients, who are also better educated, were more likely to respond to our questionnaire or that the University Hospital Cologne purposefully select these highly profitable patients.

Fifth, important variables mentioned in the conceptual model (see Fig. 1), were not assessed in our study, e.g. health worker motivation and health worker capability. In addition, other confounders influencing the relationship between physician empathy and health insurance types were not involved, such as income level, common culture of physician and patient, patients' social environment, etc.

Finally, the applied construct measuring "frequency of talking with physician" should be assessed via several data sources (patients, physicians, observer) to ensure a more reliable and valid measurement.

#### 4.3. Conclusions

This study, conducted from the patients' perspective, adds two important findings, which should be recognized by health policy and medical educators:

1. Time seems to play a crucial role in providing empathy in the clinical encounter, i.e. for high-quality healthcare.
2. Money (as represented by PHI) appears one central resource for healthcare organisations/healthcare policy to influence physicians in their decision to devote more time to private patients (see Fig. 1 "organisational factors").

These conclusions lead us to Bishop and Rees's [63] hypothesis that altruistic dimensions are generally best understood as a social construction to mask the reality of financial reward for care.

#### 4.4. Practical implications

As reflected by Franco et al. [16], excessive focus on financial incentives can lead to distortions in physicians' effort. They might lead to specific types of work outputs, but financial rewards alone are unlikely to be effective in improving the quality of individual and organisational performance. Physician empathy, in particular, is determined by several biographical and situational factors, which need to be recognized [9,11]. Franco et al. [16] conclude that integration of financial incentives with other incentives and interventions might create a more balanced approach, increasing motivation, satisfaction and performance.

#### 4.5. Future research

In the light of our fifth study limitation, the other variables in the "Conceptual model of health worker motivation" (Fig. 1) should be integrated in future studies, assessed by different types of data sources (e.g. patient, physician, hospital) to receive high data validity. An investigation of these research questions more and different types of hospitals, in other countries, with different health policies and in patients with different diagnoses would be of particular interest, as each country's experience is different and a universal blueprint of health worker motivation does not exist [16].

#### Conflict of interest statement

The authors indicated no potential conflict of interest.

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