

# BMJ Open Patient–physician relationship and use of gut feeling in cancer diagnosis in primary care: a cross-sectional survey of patients and their general practitioners

Anette Fischer Pedersen,<sup>1</sup> Christina Maar Andersen,<sup>2</sup> Mads Lind Ingeman,<sup>3</sup> Peter Vedsted<sup>1</sup>

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<sup>1</sup>Research Unit for General Practice, Aarhus Universitet, Aarhus, Denmark

<sup>2</sup>Department of Psychology, Syddansk Universitet Det Sundhedsvidenskabelige Fakultet, Odense, Denmark

<sup>3</sup>Acute Medical Admission Unit, Aarhus Universitetshospital, Aarhus, Denmark

## Correspondence to

Dr Anette Fischer Pedersen; [afp@ph.au.dk](mailto:afp@ph.au.dk)

## ABSTRACT

**Objectives** To examine whether the quality of the patient–physician relationship, assessed by the general practitioner (GP) and the patient, associates with GPs' use of gut feeling (GF) in cancer diagnosis.

**Design** Cross-sectional questionnaire survey of cancer patients and their GPs.

**Setting** Danish primary care.

**Participants** Newly diagnosed cancer patients and their GPs. Patients completed a questionnaire and provided the name of the GP to whom they have presented their symptoms. The named GP subsequently received a questionnaire.

**Primary and secondary outcome measures** GPs' use of GF in the diagnostic process for the particular patient. GPs who answered that they used their GF 'to a high degree' or 'to a very high degree' were categorised as 'used their GF to a great extent'. GPs who answered that they used their GF 'to some degree', 'to a limited degree' or 'not at all' were categorised as 'limited or no use of GF'.

**Results** GPs were less likely to use GF when they assessed relational aspects of the patient encounter as difficult compared with less difficult (OR=0.67; 95% CI 0.46 to 0.97). The physician-reported level of empathy was positively associated with use of GF (OR=2.60; 95% CI 1.60 to 4.22). The lower use of GF in difficult encounters was not modified by level of empathy.

**Conclusions** Experiencing relational aspects of patient encounter as difficult acted as a barrier for the use of GF in cancer diagnosis. Although physician-rated empathy increased use of GF, high empathy did not dissolve the low use of GF in difficult encounters. As diagnosis of cancer is a key challenge in primary care, it is important that GPs are aware that the sensitivity of cancer-related GF is compromised by a difficult patient–physician relationship.

## INTRODUCTION

Regularly, general practitioners (GPs) have to handle patient cases in which there is a real, but also a very low likelihood of serious disease.<sup>1</sup> In such cases, GPs sometimes base their clinical decisions on their gut feeling (GF). Stolper *et al.* described two types of GF in GPs: a 'sense of alarm' defined as

## Strengths and limitations of this study

- The matching of questionnaire responses from 1200 cancer patients with questionnaire responses from their GPs made it possible to examine the association between use of gut feeling (GF) and qualities of the patient–physician relationship from both perspectives.
- We used highly reliable registry data for both identification of patients and for socioeconomic covariates.
- The design of the study is retrospective and cross-sectional which may have caused recall bias and difficulties determining the causality.
- The association between quality of the patient–physician relationship and use of GF may have been underestimated due to information bias when patients are asked to rate the relational qualities of their GP and vice versa.
- GPs' use of GF was assessed by a single item.

an uneasy feeling indicating concerns about a possible adverse outcome, even though specific indications are lacking and a 'sense of reassurance' defined as a feeling of security about the management of a patient's problem, even though the diagnosis may be uncertain.<sup>2,3</sup> So far, two studies have reported positive predictive values of GPs' GF in the sense of alarm of 3%–35% regarding diagnoses of cancer.<sup>4,5</sup> Dual theories of diagnostic reasoning include a rapid intuitive system (system 1) and a slow effortful system (system 2)<sup>6</sup> and GF is often described as an element belonging to system 1.<sup>7</sup>

Research has suggested several triggers of GF in general practice. For instance, the GP's knowledge of the patient seems to be an important factor for use of GF.<sup>3</sup> If the patient acts or presents in a way, which does not cohere with the GP's image of the patient, the GP often sees this as alarming. This is supported by one study in which good or excellent knowledge of the patient was

perceived to be of great help regarding decision-making in 871 out of 1540 consultations (57%).<sup>8</sup>

Patients' emotions seem to interfere with GF. Thus, in one study of 3890 children presenting in primary care, parental concern strongly influenced the GPs' GF about serious infections in the children.<sup>9</sup> In line with this, we have found that GPs who score high on empathy and, hypothetically are more sensitive to patients' concerns, reported to use GF in their daily practice to a higher degree than GPs who scored low.<sup>10</sup> It is not known whether high empathy is associated with higher use of GF in cancer diagnosis. Previous research has shown that most patient worries are expressed implicitly,<sup>11</sup> and that physicians are more likely to provide space for further discussion of emotion if the patient expresses emotions explicitly.<sup>12</sup> If the patient is explicit about his/her symptoms, beliefs and fears, GF may be more likely to arise in the GP which again may reduce the risk of missed opportunities for cancer diagnosis.

In focus group discussions with GPs, emotions directed at the patient, such as sympathy or aversions, have been mentioned as factors, which could disturb use of GF.<sup>3</sup> On this basis, it seems relevant to examine whether consultations perceived as 'difficult' by the GP will be associated with less use of GF in cancer diagnosis. Studies have revealed associations between patients' disruptive behaviour and reduced accuracy of physicians' diagnosis,<sup>13 14</sup> but it is not known whether these findings apply to cancer diagnosis. 'Difficult patients' are also labelled as 'heartsink' or 'problem' patients, which reflect a paternalistic approach blaming the patient and ignoring the complex interplay between patient and physician.<sup>15</sup> In some instances, patients' disruptive behaviour may be implicit expression of worry or anxiety, which hypothetically is more transparent for the highly empathic GP than the less empathic GP.<sup>16 17</sup> Assuming this, a potential association between the GP's experience of a patient as difficult and use of GF might be conditioned by level of empathy.

In summary, several factors associated with the patient-physician relationship may act as facilitators or barriers for GF, but the documentation for each factor is scarce and has to be replicated in large-scale studies. Since GF can be an important diagnostic tool in the early phases of serious diseases, it is crucial that we increase our knowledge about how aspects of the patient-physician relationship interfere with the occurrence of GF. Therefore, the aim of this study was to examine quantitatively the association between GP's knowledge of the patient, GP's perceived difficulties of the encounter, patient concerns and physician empathy in a series of cancer cases. Based on previous findings we had the following hypotheses:

1. Patient encounters perceived by the GP as difficult will be associated with decreased use of GF.
2. GPs' ratings of their own general empathic capabilities will be positively associated with use of GF in specific cancer cases.
3. GPs' greater knowledge of the patient will be associated with greater use of GF.

4. Patient perceptions of their GP as highly empathic will be positively associated with the GP's use of GF.
5. Greater cancer concern in patients will be associated with greater use of GF in the GPs.

## METHODS

The study was a retrospective questionnaire study supplemented with registry data. The study was part of a larger study examining delay in diagnosis of cancer.<sup>18</sup>

## Population

The population consisted of all (not including non-melanoma skin cancers) incident cancer patients aged 18 years or older diagnosed with incident cancer in the period July 2012 to December 2013 in the Central Denmark Region and their GPs.

We identified patients based on an algorithm used previously to sample incident cancer patients through Danish registries.<sup>19</sup> One to two months after the patients were diagnosed with cancer, they received an invitation for participation and a questionnaire in which the patient stated the name of the GP who had primarily been involved in the diagnostic process of their cancer. If the patient consented, the stated GP received an invitation letter and questionnaire. If the patient had not stated a particular GP, an invitation letter and questionnaire was sent to the general practice where the patient was listed requesting the questionnaire to be completed by the GP who had primarily been involved in the patient's diagnostic process. If the practice did not confirm that they had played a role in the diagnostic process of that particular patient, the case was excluded. In this study, we included cases where patients as well as their GP had completed the questionnaire. Each included patient is unique, but each GP may have been matched with more patients.

## The patient questionnaire

Patients completed the Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPPE), which contains five items, each scored on a 7-point Likert scale (from strongly disagree=1 to strongly agree=7). The instrument is a validated measure of patient perceptions of their GP's empathic engagement (eg, the named GP: '*Seems concerned about me and my family*' and '*Understands my emotions, feelings and concerns*').<sup>20-23</sup> A high score reflects high empathic engagement. Patients were divided into three groups according to the distribution of their JSPPPE sum scores: high (highest third), moderate (middle third) and low (lowest third). Included GPs were rated on the JSPPPE by one or more patients.

In addition to the JSPPPE, patients completed a single item about cancer concerns ('*Have you at any time point before your cancer diagnosis been concerned that you could have cancer?*') Response categories: *not at all; a little; quite a lot; very much; do not know*).

## The GP questionnaire

The GPs completed the Difficult Doctor Patient Relationship Questionnaire (DDPRQ), which is a validated scale consisting of 10 items answered on a 6-point Likert scale.<sup>24</sup> Three of the items are reverse scored, and a high score of the scale reflects high difficulty. The scale measures how difficult the encounter was from the perspective of the GP (eg, 'How frustrating do you find this patient?', 'How difficult is it to communicate with this patient?' and 'Do you find yourself secretly hoping that this patient will not return?'). Scores >30 has been recommended as cut-off value to identify 'the difficult patient'.<sup>24 25</sup> However, since only 20 patients had a score >30 in the present study, we divided the DDPRQ sum scores into three groups: high (highest third), moderate (middle third) and low (lowest third).

A subsample of the included GPs (n=398) had also completed the Jefferson Scale of Physician Empathy (JSPE) in a previous study.<sup>26</sup> This scale consists of 20 items scored on a 7-point Likert scale, and higher sum scores indicate higher levels of empathy.<sup>27</sup> GPs were categorised into three groups according to the distribution of their JSPE sum scores: high (highest third), moderate (middle third) and low (lowest third).

In addition, the GPs reported their gender and age and completed three single items about their knowledge of the patient ('How would you characterise your knowledge of the patient before current illness?' Response categories: no prior knowledge; limited; fairly good; good; very good), self-perceived triggers of GF ('Although it may be difficult, please assess which conditions you believe had an effect on your gut feeling'. Response categories: the patient history; the patient's physical appearance; the overall clinical impression; knowledge of the patient; the patient's or the relatives' worries; pattern recognition; other) and their use of GF in the specific case ('To what degree did you use gut feeling in the diagnostic process for this patient?' Response categories: not at all; to a limited degree; to some degree; to a high degree; to a very high degree). As an introduction to the items about GF, a definition of the phenomenon was provided: 'Gut feeling is here understood as a GP's intuitive sense that there is something wrong with the patient although there are no clear clinical indications of this, or that the strategy used in relation to the patient is correct although the diagnosis may be uncertain'.

GPs who answered 'to a high degree' or 'to a very high degree' regarding use of GF were categorised as 'used their gut feeling to a great extent' whereas GPs who answered 'not at all', 'to a limited degree' or 'to some degree' were categorised as 'limited or no use of gut feeling'.

The JSPPPE, the DDPRQ and the JSPE were translated and adapted from English into Danish on the basis of WHO guidelines.<sup>28</sup>

## Covariates

We collected information on socioeconomic position for each patient through Statistics Denmark<sup>29</sup> in the year preceding his or her cancer diagnosis. Information on seven covariates was obtained and categorised as this:

gender (male and female), age (18–54, 55–70 and ≥71 years), marital status (cohabiting and living alone), ethnicity (ethnic Dane and immigrant/descendant), education according to Unesco's International Standard Classification of Education<sup>30</sup> (low: <10 years, middle: 11–15 years and high: >15 years), occupation (in the labour force: employed, outside the labour force: unemployed, early retirement, disability benefits, personal leave or sick leave and retired or students, old-age pensioner and students on government educational grants) and Organisation for Economic Co-operation and Development (OECD)-modified disposable household income.<sup>31</sup> Income was categorised a low, middle and high (low: <20.024€/year, middle: 20.024–53.620€/year and high: >53.620€/year). Information concerning cancer type was obtained from the Danish National Patient Register.<sup>32</sup>

## Patient and public involvement

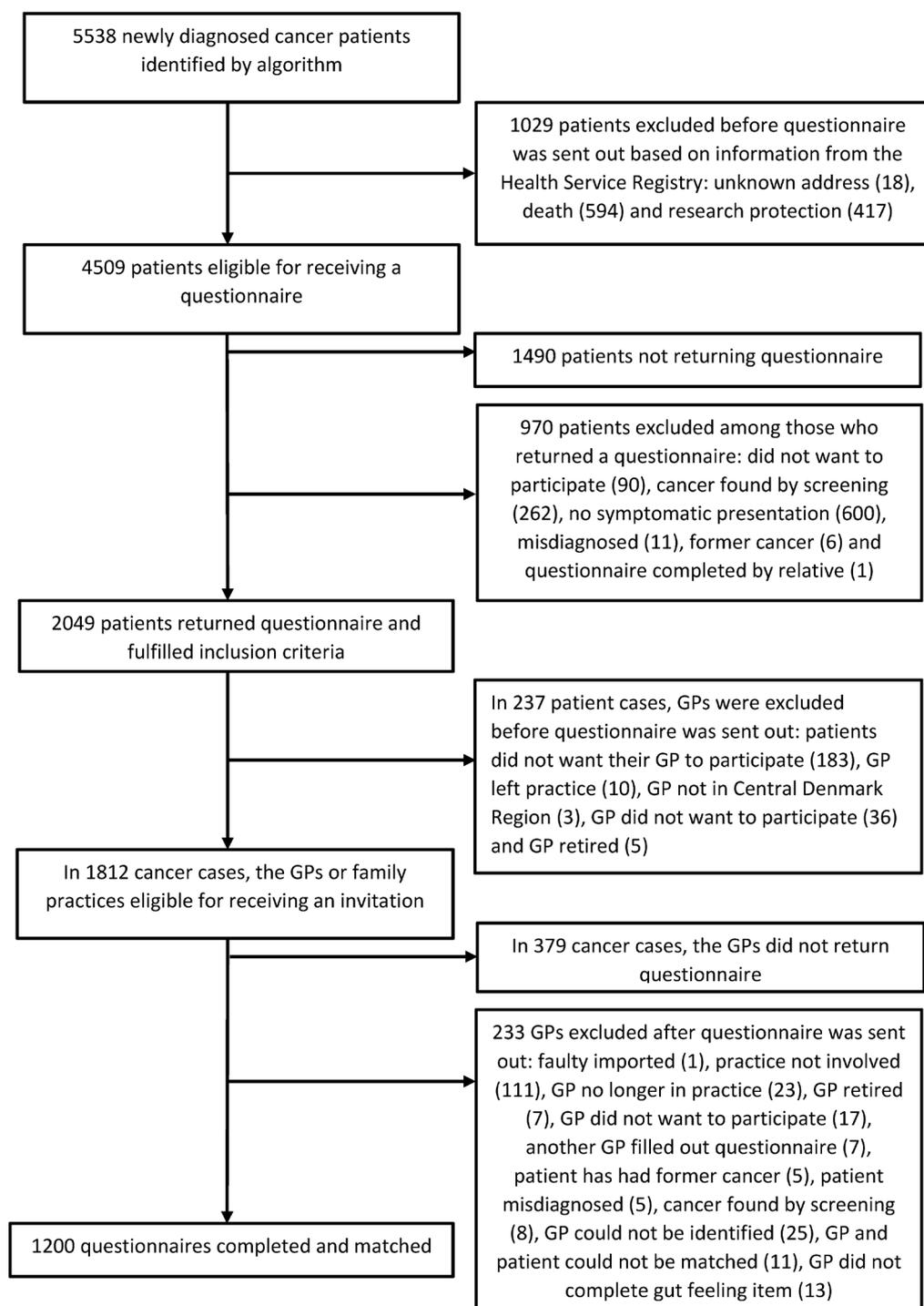
This research was done without patient involvement. Target patients (newly diagnosed cancer patients) were not invited to comment on the research questions or study design and were not consulted to develop patient relevant outcomes or interpret the results. Patients did not take part in the recruitment of participants and they were not invited to contribute to the writing of this document. Findings of the study will be disseminated to the public through relevant channels.

## Statistics

In matched cases, logistic regression analyses tested associations between GPs' use of GF and GPs' ratings of the degree of difficulty they experienced in the encounter with the patient, patients' reported perceptions of their GPs' empathy, GPs' knowledge of the patients and patients' cancer concern. We calculated associations as ORs, unadjusted as well as adjusted for covariates and GPs' gender and age. To test for a possible moderating effect of physician empathy on the hypothesised association between appraisal of difficulties in the patient–physician relationship (DDPRQ) and use of GF, a logistic regression analysis was performed including sum scores of the DDPRQ and the JSPE and an interaction variable together with covariates. We adjusted all analyses for clusters among GPs using robust variance estimation. The 95% CIs for ratios were calculated and p values of 5% or less were considered statistically significant. Listwise deletion was used for missing data. Data were analysed using STATA V.14.

## RESULTS

The algorithm identified 5538 patients (≥18 years) with newly diagnosed cancer who were found eligible for participation and 4509 patients were eligible for receiving a questionnaire. See figure 1 for a detailed description of inclusion and exclusion of patients and GPs. In 1200 cases, we obtained a completed questionnaire from both



**Figure 1** Flowchart outlining inclusion and exclusion. GPs, general practitioners.

the patient and the GP (1200/4509=27%). These questionnaires were matched and included in the analyses. In [table 1](#), matched cases are compared with eligible patients on socioeconomic measures and statistical significant differences were found regarding age, cancer site, marital status, occupation, household income and education.

The 1200 included cancer cases were seen by 581 individual GPs and nearly half of the GPs could be matched with more than one patient (ranging from 2 to 10). [Table 2](#) shows age and gender of included GPs.

As shown in [table 3](#), GF was used to a high degree or a very high degree in 302 (25%) of the cases. The three most frequently conditions perceived to have affected GF were the patient history (64%), the overall clinical impression (49%) and knowledge of the patient (29%). Patient's or relatives' worries were perceived to have affected the GF in 6% of the cases ([table 3](#)).

As revealed in [table 4](#), sum scores on the DDPQR and the JSPE were associated with use of GF. Thus, GF was significantly less often used in cases where the encounter

**Table 1** Characteristics of all eligible patients and the patients where a match with a GP questionnaire could be made

|                                    | All eligible patients,<br>N (%)†<br>5538 (100) | Matched cases, N (%)†<br>1200 (100) | P value* |
|------------------------------------|--|-------------------------------------|----------|
| Age, years                         |  |                                     | 0.003    |
| 18–54                              | 967 (17.5)                                     | 234 (19.5)                          |          |
| 55–70                              | 2431 (43.9)                                    | 551 (45.9)                          |          |
| >70                                | 2139 (38.6)                                    | 415 (34.6)                          |          |
| Sex                                |  |                                     | 0.647    |
| Female                             | 2732 (49.3)                                    | 599 (49.9)                          |          |
| Male                               | 2806 (50.7)                                    | 601 (50.1)                          |          |
| Cancer site                        |  |                                     | <0.001   |
| Breast                             | 872 (15.8)                                     | 201 (16.8)                          |          |
| Digestive organs                   | 1157 (20.9)                                    | 278 (23.2)                          |          |
| Respiratory organs                 | 676 (12.2)                                     | 108 (9.0)                           |          |
| Skin (melanoma)                    | 357 (6.5)                                      | 98 (8.2)                            |          |
| Lip, oral cavity and pharynx       | 149 (2.7)                                      | 24 (2.0)                            |          |
| Female genital organs              | 299 (5.4)                                      | 87 (7.3)                            |          |
| Male genital organs                | 759 (13.7)                                     | 179 (14.9)                          |          |
| Urinary tract                      | 315 (13.7)                                     | 56 (4.7)                            |          |
| Neuroendocrine tumours             | 326 (5.9)                                      | 55 (4.6)                            |          |
| Lymphoid and haematopoietic tissue | 403 (7.3)                                      | 79 (6.6)                            |          |
| Other                              | 225 (4.0)                                      | 35 (2.9)                            |          |
| Marital status                     |  |                                     | <0.001   |
| Cohabiting                         | 3662 (66.1)                                    | 877 (73.1)                          |          |
| Living alone                       | 1850 (33.4)                                    | 321 (26.8)                          |          |
| Ethnicity                          |  |                                     | 0.402    |
| Ethnic Danes                       | 5325 (96.2)                                    | 1162 (97.0)                         |          |
| Immigrant/descendant               | 187 (3.4)                                      | 36 (3.0)                            |          |
| Occupation                         |  |                                     | <0.001   |
| In the labour force                | 1885 (34.0)                                    | 480 (40.0)                          |          |
| Retired/students                   | 3057 (55.2)                                    | 636 (53.0)                          |          |
| Outside the labour force           | 582 (10.5)                                     | 83 (6.9)                            |          |
| OECD-modified household income     |  |                                     | <0.001   |
| Low (<20.024€/year)                | 1202 (21.7)                                    | 201 (16.8)                          |          |
| Middle (20.024–53.620€/year)       | 4000 (72.2)                                    | 913 (76.1)                          |          |
| High (>53.620€/year)               | 310 (5.6)                                      | 84 (7.0)                            |          |
| Education                          |  |                                     | <0.001   |
| ≥10 years                          | 2104 (38.0)                                    | 405 (33.8)                          |          |
| 11–15 years                        | 2345 (42.3)                                    | 532 (44.3)                          |          |
| >15 years                          | 929 (16.8)                                     | 237 (19.8)                          |          |

\* $\chi^2$  test. Since one of the assumptions of the  $\chi^2$  test is independency of observations, we tested the difference between respondents and all eligible patients without the respondents, that is, 3356 persons.

†Percentages may not add up to 100% because of missings.

GP, general practitioner.

with the patient was classified into the highest third of the DDPRQ sum scores compared with when the patient encounter was classified into the lowest third ( $OR_{adj}=0.67$ , 95% CI 0.46 to 0.97). In cases where the GP was classified

into the middle or highest third of self-reported physician empathy, GF was more likely to be used compared with cases where the GP was classified into the lowest third ( $OR_{adj}=2.45$  and 2.60, 95% CI 1.51 to 3.98 and

**Table 2** Characteristics of the 581 individual GPs participating with one or more cancer patients

|                     | N (%)      |
|---------------------|------------|
| Sex                 |            |
| Female              | 267 (46.0) |
| Male                | 314 (54.0) |
| Age, years          |            |
| 26–39               | 88 (15.2)  |
| 40–59               | 379 (65.2) |
| ≥60                 | 114 (19.6) |
| No of matched cases |            |
| 1                   | 271 (46.6) |
| 2                   | 137 (23.6) |
| 3                   | 99 (17.0)  |
| 4                   | 41 (7.1)   |
| 5                   | 18 (3.1)   |
| 6 or more           | 15 (2.6)   |

GPs, general practitioners.

1.60 to 4.22). When analysing data for the subsample of cases (n=868) where GPs had completed the JSPE, no significant interaction between sum scores of the DDPRQ and the JSPE on use of GF was revealed ( $OR_{adj}=1.00$ , 95% CI 1.00 to 1.00,  $p=0.889$ ).

In cases, where GPs reported fairly good or good knowledge of the patient before current illness, GF was less likely to be used compared with cases where GPs reported no prior knowledge of the patient ( $OR_{adj}=0.49$  and  $0.56$ , 95% CI  $0.28$  to  $0.86$  and  $0.33$  to  $0.93$ ).

Patients' worry about cancer in the course before diagnosis was not associated with likelihood of GF use as was neither patients' perception of physician empathy on the JSPPPE. Neither of the covariates (ie, ethnicity, occupation status, educational level, marital status, household income and cancer type) were associated with use of GF.

The JSPPPE mean scores for GPs who rated themselves in the lowest, middle or highest of the JSPE were 29.1 (SD=5.5), 29.5 (SD=5.5) and 29.0 (SD=6.2), respectively. The results of analysis of variance with Bonferroni used to correct for multiple comparisons indicated that the difference was not statistically different ( $F_{(2, 371)}=0.22$ ,  $p=0.806$ ).

## DISCUSSION

### Main findings

When the GP appraised a patient encounter to contain many difficulties, the GP was less likely to use GF in the diagnostic process for the patient compared with when the GP appraised the patient encounter to contain few difficulties. Therefore, hypothesis 1 was supported. The findings also supported our second hypothesis, as GPs who previously had rated their own general empathic capabilities as high were more likely to use GF in cancer

cases compared with when the GPs had rated their capabilities as low. The results did not document a moderating role of GPs' ratings of their own empathic abilities on the association between assessment of difficulties in the relationship and use of GF. This means that although physician-rated empathy increased use of GF, high empathy did not change the low use of GF in difficult encounters. Contrary to our third hypothesis, we found that increased knowledge of the patient before current illness was associated with less use of GF. Thus, in cancer cases where the GP characterised his or her knowledge about the patient as 'good', GF was less likely to be used compared with when the GP had no prior knowledge of the patient (ie, first contact). Meanwhile, the relationship between knowledge of the patient and use of GF was not linear and only significant when comparing 'good knowledge' with 'no prior knowledge'.

The results of the study did not support the fourth hypothesis, since patients' perceptions of physician empathy did not relate to the GPs' use of GF. The lack of association between patients' perceptions of physician empathy and GPs' use of GF may be explained by a highly skewed score distribution with the GPs in 37% of the cases received the highest possible score on the JSPPPE. The results did not support our fifth hypothesis since patients' concerns about having cancer in the time before diagnosis did not relate to the GPs' use of GF. This agrees with another of our findings, namely that only in 6% of the 865 cancer cases in which GF was used to at least a limited degree, the involved GPs reported that the patient's or the relatives' concerns had had an effect on their GF.

### Strengths and limitations

One strength is the design combining questionnaire data from 1200 cancer patients as well as their GPs. This design made it possible to examine the association between use of GF and qualities of the patient–physician relationship from both perspectives. Another strength is the use of highly reliable registry data for both identification of patients and for socioeconomic covariates. The use of registers rules out selection bias concerning invited patients and limits missing information concerning socioeconomic covariates. Finally, we used validated rating scales for the assessment of the difficult patient encounters, patients' perceptions of physician empathy and GPs self-reported physician empathy.

However, some limitations are also present. The results revealed differences between respondents and non-respondents regarding age, cancer type, occupation status, household income and education. Thus, respondents were more often in the labour force, in the middle or high household income groups and had longer education compared with non-respondents. These differences are frequent in surveys and may affect generalizability of results. Second, the design of the study is retrospective and cross-sectional which may cause recall bias and difficulties determining the causality. GPs were aware about

**Table 3** Descriptive results of scales and single items

| Patient-reported continuous variable (no of items; min/max possible scores)                                 | N    | Median (IQR)  |
|---|------|---------------|
| Jefferson Scale of Patient's Perceptions of Physician Empathy (5 items; 5/35)                               | 1063 | 32 (26–35)    |
| GP-reported continuous variables (no of items; min/max possible scores)                                     |      |               |
| Difficult Doctor–Patient Relationship Questionnaire (10 items; 10/60)                                       | 1175 | 16 (14–19)    |
| Jefferson Scale of Physician Empathy (20 items; 20/140)   | 396* | 118 (109–124) |
| Patient-reported single item  | N    | N (%)         |
| Have you at any time point before your cancer diagnosis been concerned that you could have cancer?          |      |               |
| Not at all  |      | 701 (59.5)    |
| A little  |      | 313 (26.6)    |
| Quite a lot   |      | 89 (7.6)      |
| Very much   |      | 49 (4.2)      |
| Do not know†  |      | 26 (2.2)      |
| GP-reported single items  |      |               |
| How would you characterise your knowledge of the patient before current illness?                            |      |               |
| No prior knowledge (first contact)  | 1191 | 106 (8.9)     |
| Limited   |      | 153 (12.9)    |
| Fairly good   |      | 186 (15.6)    |
| Good  |      | 370 (31.1)    |
| Very good   |      | 376 (31.6)    |
| To what degree did you use gut feeling in the diagnostic process for this patient?                          |      |               |
| Not at all  | 1200 | 335 (27.9)    |
| To a limited degree   |      | 204 (17.0)    |
| To some degree  |      | 359 (29.9)    |
| To a high degree  |      | 222 (18.5)    |
| To a very high degree   |      | 80 (6.7)      |
| Although it may be difficult, please assess which conditions you believe had an effect on your gut feeling. |      |               |
| The patient history   | 865‡ | 556 (64.3)    |
| The patient's physical appearance   |      | 156 (18.0)    |
| The overall clinical impression   |      | 422 (48.8)    |
| Knowledge of the patient  |      | 254 (29.4)    |
| The patient's or the relatives' worries   |      | 52 (6.0)      |
| Pattern recognition   |      | 181 (20.9)    |
| Other (not specified)   |      | 123 (14.2)    |

\*396 individual GPs and 868 cases.

†Patients responding 'don't know' were excluded from the analyses.

‡This item was only completed by GPs who had used gut feeling to at least a limited degree the diagnostic process. GPs were allowed to tick off more than one condition.

GPs, general practitioners.

patients' cancer diagnoses when completing the questionnaire, which may have caused reporting bias. Third, 11% of the patients did not complete the JSPPPE and the results showed a ceiling effect for responders. Reporting bias are likely and since patients should state the name of the GP who played the biggest role in their diagnostic course, we believe that the 11% of the patients who did

not complete the JSPPPE may have been some of the least satisfied patients. Selection and reporting bias will probably have underestimated the association between scores on the JSPPPE and use of GF. We also observed a tendency that scores on the DDPRQ were skewed towards the lower tail of the distribution and only 20 patient encounters (2%) could be classified as difficult when using the

**Table 4** Associations between the GPs' use of gut feeling (dependent variable) and patients' cancer concerns, patients' evaluation of GPs' empathic abilities, GPs' self-reported physician empathy, GPs' ratings of the patient encounter and GPs' characterisation of their knowledge of the patient before current illness (n=1041–1175 cancer cases)

|  | OR <sub>unadj</sub> * (95% CI) | OR <sub>adj</sub> † (95% CI) |
|--|--------------------------------|------------------------------|
| Patient encounter rated as                           |                                |                              |
| Least difficult                                      | 1.00                           | 1.00                         |
| Middle group   | 0.85 (0.61 to 1.19)            | 0.87 (0.62 to 1.24)          |
| Most difficult                                       | <b>0.65 (0.45 to 0.92)</b>     | <b>0.67 (0.46 to 0.97)</b>   |
| GP rated by patient as                               |                                |                              |
| Least empathic                                       | 1.00                           | 1.00                         |
| Middle group   | 0.98 (0.73 to 1.31)            | 0.92 (0.67 to 1.25)          |
| Most empathic  | Omitted‡                       | Omitted‡                     |
| GPs' ratings of themselves§                          |                                |                              |
| Least empathic                                       | 1.00                           | 1.00                         |
| Middle group   | <b>2.42 (1.52 to 3.85)</b>     | <b>2.45 (1.51 to 3.98)</b>   |
| Most empathic  | <b>2.39 (1.51 to 3.78)</b>     | <b>2.60 (1.60 to 4.22)</b>   |
| GP's knowledge of patient                            |                                |                              |
| No prior knowledge                                   | 1.00                           | 1.00                         |
| Limited  | 0.68 (0.38 to 1.20)            | 0.60 (0.33 to 1.08)          |
| Fairly good  | <b>0.54 (0.31 to 0.95)</b>     | <b>0.49 (0.28 to 0.86)</b>   |
| Good   | <b>0.60 (0.37 to 1.00)</b>     | <b>0.56 (0.33 to 0.93)</b>   |
| Very good  | 0.88 (0.53 to 1.45)            | 0.80 (0.47 to 1.36)          |
| Patient worries about having cancer before diagnosis |                                |                              |
| Not worried  | 1.00                           | 1.00                         |
| A little worried                                     | 0.99 (0.73 to 1.36)            | 1.03 (0.74 to 1.44)          |
| Worried quite a lot                                  | 0.74 (0.43 to 1.28)            | 0.87 (0.49 to 1.53)          |
| Very much worried                                    | 1.18 (0.61 to 2.27)            | 1.19 (0.61 to 2.32)          |

Numbers in bold are significant results.

\*Not adjusted for covariates but adjusted for clusters among GPs.

†Adjusted for patients' gender, age, marital status, ethnicity, educational level, household income and GPs' gender and age and clusters among GPs.

‡The distribution of sum scores was skewed and the highest possible score included the 66th percentile.

§Included only the 868 (unadjusted)/848 (adjusted) cancer cases carried out by the 396 GPs who had completed the JSPE in a previous study.

GPs, general practitioners; JSPE, Jefferson Scale of Physician Empathy.

recommended cut-off score. In other studies, 10%–20% of patient encounters in various settings have been classified as difficult.<sup>24 25</sup> The awareness of a recent cancer diagnosis of the patient might have induced recall bias when the GPs retrospectively characterised the quality of the encounter with the patient, which again may have underestimated the association between scores on the DDPRQ and use of GF. Finally, a single item developed for use in a previous study<sup>33</sup> measured the use of GF. The item was pilot-tested, but not further validated. After our data were collected, a promising 11-item GF questionnaire was published.<sup>34</sup>

### The findings in relation to other studies

When the GP judged a patient encounter to contain many difficulties, the GP was less likely to use GF in the diagnostic process, even when we adjusted for the gender

and age of the GP. In some studies, younger physicians have been more likely to appraise patient encounters as difficult, but other studies have not supported this.<sup>35</sup> Difficult encounters seem to be a burden to the GP, but the direction of causality is difficult to determine and the consequences for the quality of patient care are not well-described.<sup>35</sup> One study revealed no association between a high frequency of difficult patient encounters and quality of care operationalised as hypertension and diabetes management and preventive care based on national guidelines.<sup>36</sup> Meanwhile, this study did not examine quality of care for the particular patient encounter appraised as difficult. Another study revealed that patients involved in difficult encounters were more likely to have worsening of symptoms 2 weeks after the index consultation.<sup>25</sup> Future studies should examine

whether difficult encounters increase the risk of missed opportunities for cancer diagnosis.

We found a tendency that better knowledge of the patient related to less use of GF. When the GP had no prior knowledge of the patient, the likelihood of using GF was highest. On the one hand, this contradicts previous studies where GPs have believed that prior knowledge of a patient is an important condition for use of GF.<sup>3</sup> On the other hand, GPs have also reported that when patients who never visit their physician suddenly turn up, this is alarming in itself.<sup>35</sup> This may explain why cases where the GP had no prior knowledge of the patient (ie, first contact) had the highest likelihood of using GF although we did not register whether poor prior knowledge of the patient was due to patient's infrequent visits or change of practice.

Patients' perceptions of their GPs' physician empathy did not associate with GPs' appraisal of their own general empathic capabilities. This corresponds to previous findings.<sup>20–22</sup> We attribute this lack of association to the ceiling effect of the JSPPPE and to nearly half of the GPs having only one JSPPPE-questionnaire completed by a single patient leading to high risk of measurement uncertainty. Meanwhile, one study including 23 residents with completed forms from 1 to 11 patients revealed a significant correlation between scores of the JSPPPE and JSPE.<sup>36</sup> No ceiling effect of JSPPPE was observed in this study and rating a resident at a hospital may induce less risk of response bias compared with when rating your GP with whom the patient often has had a long-term relationship.

In disagreement to results from a former study revealing that parental concern strongly influenced the GPs' GF about serious infections in the children,<sup>9</sup> patients' concerns about having cancer in the time before diagnosis did not relate to the GPs' use of GF in this study. Unfortunately, we did not register whether the cancer concern was explicitly expressed in the consultation and whether the cancer concern, either expressed implicitly or explicitly, was perceived by the GP. These issues may be of importance considering the potential influence of patient concern on GP GF.

### Conclusions and implications

GPs were less likely to use GF in the cancer diagnostic process when they appraised relational aspects of the encounter as difficult compared with when they appraised the encounter as less difficult. GPs who rated themselves as highly empathic were more likely to report use of GF in cancer diagnosis compared with when they rated themselves as less empathic, but high empathy did not dissolve the low use of GF in difficult encounters. Physician-rated empathy did not relate to patient-perceived physician empathy, and GPs did not use GF more in cases where the patients reportedly were anxious about cancer before diagnosis compared with cases where the patients were not anxious about cancer. Diagnosis is one of the key challenges for GPs and use of GF can be an important tool when diagnosing serious diseases especially in their early phases. However, to prevent harmful use of GFs, it

is important that GPs are aware that the responsiveness of GF to cancer-related symptoms may be reduced in a difficult patient–physician relationship. To reduce risk of additional patient anxiety and threats to patient safety, more research is needed to test the sensitivity and specificity of GPs' GF, both with respect to sense of alarm and sense of reassurance. The research has to be carried out with methods that do not favour cases where the GF was accurate and perhaps stand out more clearly in the memory of the GP.

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**Data sharing statement** Data are kept at Statistics Denmark, Sejrøgade 11, 2100 København Ø and subjected to data protection regulations. Requests for access to data should be addressed to the corresponding author.

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