General Practitioner empathy, patient enablement, and patient-reported outcomes in primary care in an area of high socio-economic deprivation in Scotland - A pilot prospective study using structural equation modelling

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Abstract

Objectives

The aim of this pilot prospective study was to investigate the relationships between General Practitioner (GPs) empathy, patient enablement, and patient-assessed outcomes in primary care consultations in an area of high socio-economic deprivation in Scotland.

Methods

This prospective study was carried out in a 5 doctor practice in an area of high socio-economic deprivation in Scotland. Patients' views on the consultation were gathered using the Consultation and Relational Empathy (CARE) Measure and the Patient Enablement Instrument (PEI). Changes in main complaint and well-being 1 month after the contact consultation were gathered from patients by postal questionnaire. The effect of GP empathy on patient enablement and prospective change in outcome was investigated using structural equation modelling.

Results

323 patients completed the initial questionnaire at the contact consultation and of these 136 (42%) completed and returned the follow-up questionnaire at 1 month. Confirmatory factor analysis confirmed the construct validity of the CARE Measure, though omission of two of the six PEI items was required in order to reach an acceptable global data fit. The structural equation model revealed a direct positive relationship between GP

empathy and patient enablement at contact consultation and a prospective relationship between patient enablement and changes in main complaint and well-being at 1 month.

Conclusion

In a high deprivation setting, GP empathy is **associated** with patient enablement at consultation, and enablement predicts patient-rated changes 1 month later. **Further larger studies are desirable to confirm or refute these findings**

Practice Implications

Ways of increasing GP empathy and patient enablement need to be established in order to maximise patient outcomes. Consultation length and relational continuity of care are known factors; the benefit of training and support for GPs needs to be further investigated.

[284 words]

1. Introduction

The clinical encounter between patients and doctor is the core activity of medical care and has received particular attention in primary care [1]. However, the recent quality agenda in primary care has focused more on access and bio-medical aspects of care than on relational aspects [1-3]. Despite this, general practitioners (GPs) show continuing wide-spread support for a holistic approach to primary care, with empathy as a key element [4]. Similarly patients across the socio-economic spectrum place a high value on empathic care [5-10].

Empathy is a basic component of the therapeutic relationship [6] and has been demonstrated to enhance patient enablement [11-15] and patient satisfaction [16,17]. However, the evidence linking empathic, enabling care to health outcomes is limited [12-13, 17]. Such evidence is important in understanding the role of empathy in health outcomes [6], in the selection of appropriate tools for measuring and monitoring interpersonal effectiveness [15], and in ensuring that relationship-centred approaches to care are facilitated by and supported within healthcare systems [17]. We have recently postulated an effect model of empathic communication in the clinical encounter to explain how an empathic physician can achieve improved patient outcomes [17].

The present paper reports a pilot prospective study of the relationships between patients' perception of the doctors' empathy, patient enablement, and perceived changes in health, in patients attending GPs in an area of high socio-economic deprivation in Scotland. Such GPs have more problems to deal with in a shorter period of time and report higher stress levels in consultations compared with those working in more affluent areas [4,18]. As there is currently limited empirical evidence on the relationship between empathy, enablement and health outcomes in primary care, the purpose of the present investigation was to explore:

(a) the direct effect of patient-reported GP empathy on patient enablement at consultation

(b) the indirect effect of patient-reported GP empathy at consultation on patient-rated health outcomes at 1 month post-consultation.

According to these objectives the following two hypotheses (H_{I-II}) were derived and studied:

H_I: GP empathy contributes directly to patient enablement at consultation.

H_{II}: GP empathy contributes indirectly to health outcomes via patient enablement.

2. Methods

2.1 Study Design

The study was carried out in a 5 doctor health centre in an area of high socio-economic deprivation in Glasgow, Scotland. The number of patients registered with the practice is approximately 5,500, and all appointments are booked in advance at 10 minute intervals. The 5 GP in the practice (2 male and 3 female) have been in practice for between 1- to 25 years. Ethical approval was obtained for the study from the Local Research Ethics Committee and funding for the study was obtained from Greater Glasgow Primary Care Trust. Unselected consecutive adult patients (18 years and over) attending routine consultations with all 5 GPs were asked by reception staff to complete a questionnaire immediately after seeing the doctor and to agree to being followed up by post at 1 month to assess changes in main complaint and well-being. Informed consent was obtained from each participant.

2.2 Measures

The questionnaire was issued to patients immediately after their consultation with the GP by our researcher. An information sheet was included and informed, signed consent was obtained from each participating patient. The questionnaire gathered information on age, gender, and general health over the last 12 months [18] (‘*over the last 12 months, would you say your health has on the whole been’; rated as very good/good/fair/bad/very bad and scored from 1-5).*

Patients’ perception of the GPs empathy was measured using the ten item Consultation and Relational Empathy (CARE) Measure [8,9]. The **CARE Measure** captures patients views on the process of the consultation by asking patients;

How was the doctor at…:

1. Making you feel at ease
2. Letting you tell your “story”
3. Really listening

4. Being interested in you as a whole person
5. Fully understanding your concerns
6. Being caring and compassionate
7. Being positive
8. Explaining things clearly
9. Helping you to take control
10. Deciding on a treatment plan with you.

Each item includes a statement which gives examples of the sorts of behaviours, attitudes and skills that the doctor might show. Rating is on a 5 point scale from poor to excellent and scored from 1-5 and thus the lowest possible score is 10 and the highest possible score is 50 [8,9].

Patient enablement was measured by the patient enablement instrument (PEI) [19,20]. Within the PEI, six questions ask patients to rate whether, as a result of the consultation, they feel more: (1) able to cope with life, (2) able to understand their illness, (3) able to cope with their illness, (4) able to keep healthy, (5) confident about their health and (6) able to help themselves. Rating is on a 3 point scale (same or less/ better/ much better) and scored as 0, 1, 2. Thus the lowest possible score for the total measure is 0 and the highest possible is 12 [19,20].

The completed questionnaire was placed in a sealed box in the reception area. Follow-up by post at 1 month asked patients to report their change in main complaint and well-being using the ORIDL (Outcomes in Relation to Impact on Daily Life) Measure [21], formerly known as the GHHOS [12]. A telephone reminder call was made if the patient did not return the follow-up questionnaire within 3-4 days.

2.3 Sample

323 patients agreed to take part and of these 136 (42%) completed and returned the follow-up questionnaire. Patients who returned the follow-up data (responders) were significantly older than those who did not, and GPs reported higher levels of tiredness in consultations in the responders compared with the non-responders group (Table 1). Otherwise there were no significant differences in the other variables between the two groups (Table 1).

[INSERT TABLE 1 HERE]

2.4 Data analysis

For the 136 patients included in the study, a maximum of 17.9% missing values in the items of the scales were observed. Prior to the main data analyses, these missing values were imputed by the expectation-maximization (EM) algorithm. The EM algorithm estimates missing data using an iterative maximum-likelihood estimation procedure. It is one of the recommended methods for preventing biases caused by not completely random missing data processes [22, 23]. The imputation was performed with the software NORM [24].

For the descriptive statistics of the scales SPSS 12.0 for Windows software (SPSS Inc., Chicago, IL) was used.

In order to estimate the multivariate dependencies, structural equation modeling (SEM) was employed [25, 26] (see also [27] for more details of the SEM-technique). The maximum-likelihood estimation procedure [26, 28] implemented in the software AMOS 5.0 [29] was used to develop and test all structural models. The input for SEM was the empirical covariance matrix. In accordance with Kline [26], a two-step SEM procedure was applied. In the first step, a confirmatory factor analysis (CFA) was conducted to determine whether the intended constructs were indeed measured. CFA assumes each manifest variable to be a distinct indicator of an underlying latent construct, whereby different constructs are permitted to be inter-correlated. The appropriateness of a specific CFA model was assessed by measures of global and local fit.

Measures of global fit indicate whether the empirical associations among the manifest variables are appropriately reproduced by the model [26, 30]. For a variety of these global fit measures certain criteria have to be met in order to accept the model under study as plausible and parsimonious. Measures of absolute fit like 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. The model may be classified as **good**, if only 8% or less of the information is not accounted for by the model (RMSEA <0.08). Furthermore, measures of incremental fit were employed [31]: the comparative fit index (CFI) and the Tucker-Lewis index (TLI). The rationale of these measures is that more complex, i.e., less restrictive models are penalized by a downward adjustment, while more parsimonious, i.e., more restrictive models are rewarded by an increase in the fit index. A rule of thumb for incremental fit measures is that values >0.95 are indicative of good fit relative to the independence model. Hair et al. [32] suggest adjusted index cut-off values based on model characteristics: simpler models and smaller samples should be subject to more strict evaluation than more complex models with larger samples. According to this study, they recommend for samples $N<250$ and a number of observed variables between 12 and 30 a CFI and a TLI of **0.95** or above and an RMSEA $\leq$0.08 as indicative of **good** fit.

Measures of local fit evaluate whether each construct can be reliably estimated from its indicators [32, 33] and whether the constructs within the model are sufficiently distinguishable [34]. Because coefficient alpha as a measure of construct reliability wrongly assumes that all indicators contribute to reliability equally [35] we chose composite reliability, which draws on the unstandardized regression weights and measurement error components for each indicator [34, 35].

In the second step, a path model was specified and evaluated using measures of global fit. 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.

3. Results

3.1 Confirmatory factor analysis

In the present analysis we tested the two hypotheses based on previous empirical findings and theoretical consideration as outlined in the introduction. With regard to these theoretical considerations, the indicators (i.e., CARE Measure items, PEI items, ORIDL items) of the "original CFA model" with insufficient model compatibility were sequentially eliminated from the model until criteria for a good model-fit were reached. Items were eliminated if (a) indicator reliabilities were low (<0.40; [34]) or (b) modification indices suggested that residual correlations would entail a substantial improvement of fit [26]. Checking the "original CFA model" against this background, item 5 und 6 of the patient enablement instrument (PEI) scale ("confidence about health" and "more able to help themselves") had to be eliminated from the model. Moreover, two residual correlations (e13 and e14, e19 and e18,) of the CARE Measure had to be implemented. These residual correlations show that CARE Measure items 4 ("Being interested in you as a whole person") and 5 ("Fully understanding your concerns") are unexpectedly highly correlated with each other and thus have something special in common in contrast to the remaining items of the CARE measure. Items 9 ("Helping you to take control") and 10 ("Making a plan of action") are similarly highly correlated with each other.

The resulting "modified CFA model" comprised **16 items** and exhibited a **good** global data fit (see Table 2, row CFA). Furthermore, indices of local fit proved that each latent construct was reliably measured by its indicators: for each manifest item, more than 40% of its information was predicted by its underlying construct (indicator reliability >0.40, see Table 3, column 2) and all factor loadings were significant (see Table 3, column 3). The factor reliabilities (see Table 3, column 4) as well as the average proportions of indicator variance extracted by the corresponding latent construct (see Table 3, column 5) exceed the recommended critical values. Finally, it was tested whether each latent variable is higher associated with its own indicators than with any other construct in the model. This was verified using the Fornell-Lacker-criterion [34], which is fulfilled for a specific construct, if the root of its average variance-extracted estimate (see Table 4, column 5) is greater than its interconstruct squared correlations. The data in Table 4 show, that this criterion is fulfilled for all constructs in the model, thus, discriminant validity of the structural components can be inferred.

3.2 Structural equation model

After having ensured an acceptable measurement quality of the “modified CFA model”, structural relationships between latent variables were specified as implied by the hypotheses. This “full path model” (see Table 2, row 4) yielded virtually the same measures of global fit as the “modified CFA model”, demonstrating that the model structure was in accordance with the empirical data. Figure 1 illustrates the structural model of the “full path model”, indicating estimated (only significant) path coefficients and the percentage of explained variances for the endogenous structural variables. Measurement models coefficients were equivalent to those proved in the “modified CFA model” (see Table 2) and are not shown in Figure 1.

Results within the “full path model” can be described as follows: Patients’ perceptions of the GPs empathy (CARE Measure) showed a positive relationship with patient enablement (PEI) at consultation (path co-efficient of 0.31), which in turn was predictive of positive changes in main complaint and well-being 1 month after the consultation (path co-efficient 0.31).

4. Discussion and Conclusions

4.1 Discussion

The present prospective study investigated the relationships between GP empathy, patient enablement, and patient-rated outcomes in primary care consultations in an area of high socio-economic deprivation in Scotland using structural equation modelling. Confirmatory factor analysis confirmed the construct validity of the CARE Measure. It did however reveal a strong association between items 4 and 5 of the measure, ("Being interested in you as a whole person" and "Fully understanding your concerns"). This is perhaps unsurprising because without taking a 'whole-person' approach it is unlikely that a GP could fully understand patients' concerns. Items 9 ("Helping you to take control") and 10 ("Making a plan of action") were similarly highly correlated with each other, and again this is unsurprisingly as both of these relate to 'empathic action' [6] in the form of information giving, empowerment and shared decision making.

Omission of two of the six PEI items was required from the "original CFA model" in order to reach an acceptable global data fit. An explanation may be that item 5 ("confident about health") refers to general health status and does not fit with the first four items which focus on enablement. Regarding the omission of item 6 ("able to help yourself") it might be that it functions as a summarizing global question of the first four items and therefore being redundant in this model. However, these results have to be verified in further confirmatory factor analysis and psychometric evaluations with bigger samples of (primary care) patients.

The structural equation model revealed a direct positive relationship between GP empathy and patient enablement at contact consultation and a positive prospective relationship between enablement and changes in main complaint and well-being at 1 month.

4.1.1 Comparison with published literature

The confirmatory factor analysis of the CARE measure confirms similar findings on the robust internal structure of this measure reported previously in primary and secondary care settings [9,18,36,37]. The CFA results are essentially also the same as those of the German translation of the CARE measure, which was tested with cancer patients in secondary care [38].

The importance of physician empathy for patient enablement also confirms previous work in primary and secondary care [11-15,18,21]. The relationship between enablement at consultation and health outcomes at 1 month is a new finding in primary care, though similar relationships have been suggested in secondary care and other settings [13-15, 18]. Direct effects of empathy on outcomes have also been reported in the literature [6, 13, 39] and there is a growing body of evidence linking certain aspects of patient-centred consulting with improved health outcomes [40]. We have recently postulated an effect model to explain how different aspects of physician empathy may influence different outcomes [18].

4.1.2 Strengths and Limitations of this study

A strength of this pilot study is that is has brought the robust methodology of SEM to model the inter-relationships between GP empathy, patient enablement and change in main complaint and well-being prospectively. Furthermore, causal inferences from the identified relationships in our model are more valid than in correlational studies, because of the prospective design of the study. In focusing reliable constructs, SEM enables the description and estimation of ‘real world’ complex relationships [41]. Being able to carry out this work in primary care in an area of high socio-economic deprivation is also a strength as such ‘coal-face’ research in areas of greatest need is sparse [36].

However, a weakness was the limited size of the study both in terms of numbers of patients and numbers of doctors, and the fact that there was no ‘opposite’ group (i.e., GPs working in a more affluent area) against which to compare. The response rate to follow-up was also relatively low, with a difference in the age of those who did and did not respond to the follow up questionnaire (though no other differences between the two groups in any other variables were found). Thus we cannot generalize these findings to the whole population, nor indeed to GPs working in deprived areas overall; larger studies are required to do this. Additionally, the SEM approach applied here did not control for moderator variables (e.g. differences between GPs [12]). Such influences need to be examined in further multi-group analyses of the structural model in larger studies. The outcome measure used to measure changes in main complaint and overall well-being (the ORIDL) is a transition measure and has only recently undergone preliminary validation against more established serial measures [21] and thus more work is required to establish it is a useful and reliable tool. Finally, omission of two of the six PEI items was required from the "original CFA model" in order to reach an acceptable global data fit. Though this modification did not lead to changes in the meaning of the constructs, it was partly exploratory in nature and needs cross validation.

4.2 Conclusions

In a high deprivation setting, GP empathy is associated with patient enablement at consultation, and enablement predicts outcome 1 month after contact consultation. **Further larger studies are desirable to confirm or refute these findings**

4.3 Practice Implications

GP empathy is an important part of enabling patients, with implications for positive health outcomes. **Therefore, ways of enhancing GP empathy and patient enablement need to be established. Relational continuity of care and consultation length are both positively related to empathy and enablement [15,20,36,37] and healthcare systems may require organisational change in order to ensure adequate time and continuity. Zatinge et al [42] has reported that GPs with a subjective experience of a lack of time are less patient-centred but showing eye contact and empathy and asking questions about psychological or social topics are associated with more awareness of patients' psychological problems. The benefit of GPs support and**

training on empathy and enablement also needs to be explored further, as does the role of verbal and non-verbal communication in patient enablement and health outcomes.

Acknowledgements

SWM was supported by a Primary Care Research Career Award from the Chief Scientist Office, Scottish Executive Health Department. We would like to thank all the doctors, staff and patients who participated.

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Figure 1: "Full path model": estimated (only significant < .001) path coefficients for the endogenous structural constructs

Table 1: Baseline descriptive statistics for total sample, responders and non-responders

	Total Sample	Responders	Non-Responders	P-value
Age Mean (SD)	45.58 (16.86)	49.94 (16.57)	43.21 (16.56)	0.001[a]
Gender % female	64%	58%	66%	0.095[b]
General Health Mean (SD)	2.66 (1.09)	2.67 (1.11)	2.65 (1.08)	0.861[a]
CARE Score	42.4 (8.1)	43.5 (8.4)	41.9 (8.4)	0.105[b]
PEI Score	3.65 (3.85)	4.04 (3.97)	3.43 (3.77)	0.062[b]

[a] unpaired t-test

[b] Chi-squared (Mann-Whitney U)

Table 2: Measures of global fit for all models estimated

	χ^2	df	p	χ^2/df	TLI	CFI	RMSEA	LO - HO
Thresholds for acceptable fit			> .05	< 2	> .95	> .95	$\leq$ .08	
Modified CFA model	188.4	100	< .001	2	.96	.97	.08	.063 - .099
Full path model	188.9	101	< .001	2	.96	.97	.08	.062 - .098

Note: TLI: Tucker-Lewis Index, CFI: Comparative Fit Index, RMSEA: Root Mean Square Error of Approximation; LO: lower boundary of the two-sided 90% confidence interval of RMSEA; HO: upper boundary of the two-sided 90% confidence interval of RMSEA

For thresholds of good fit see Hair et al. [32] and Kline [26]

Table 3: Measures of local fit for the “modified CFA model”

Factor	Indicator reliability	t-value of factor loading	Factor reliability	Average variance extracted
Thresholds for acceptable fit	> *.40*	p < .05	> *.60*	> *.50*
CARE			.98	.81
emp1	.73	_a		
emp2	.82	14.90***		
emp3	.88	16.0***		
emp4	.84	15.28***		
emp5	.83	15.10***		
emp6	.84	15.24***		
emp7	.80	14.64***		
emp8	.76	13.84***		
emp9	.78	14.12***		
emp10	.76	13.81***		
PEI at consultation			.93	.77
e1	.79	_a		
e2	.67	15.32***		
e3	.77	12.96***		
e4	.82	14.88***		
ORIDL			.77	.63
gssmc2	.80	/		
goswb2	.83	/		

.[a] Unstandardized values were set equal to 1 in order to ensure identifiably.****p* <0.001

Table 4: Fornell-Lacker test of discriminant valididty

	CARE	PEI atcons	ORIDL
CARE	.90[a]	.306 [b]	.043
PEI at cons		.877	.283
ORIDL			.794

[a] square root of AVE in the diagonal
[b] Intercorrelation in the off-diagonal cells