Directing Improvements in Primary Care Patient Experience through Analysis of Service Quality

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Objective. To examine the influence of dimensions of service quality on patient experience of primary care.

Data Sources/Study Setting. Data from the national GP Patient Survey in England 2014/15, with responses from 858,351 patients registered at 7,918 practices.

Study Design. Expert panel and principal component analysis helped identify relevant dimensions of service quality. Regression was then used to examine the relationships between these dimensions and reported patient experience.

Data Collection/Extraction Methods. Aggregated scores for each practice were used, comprising the proportion of positive responses to each element of the study.

Principal Findings. Of eight service quality dimensions identified, six have statistically significant impacts on patient experience but only two have large effects. Patient experience is highly influenced by practice responsiveness and the interactions with the physician. Other dimensions have small or even slightly negative influence. Service quality provided by nurses has negligible effect on patient experience.

Conclusions. To improve patient experience in primary health care, efforts should focus on practice responsiveness and interactions with the physician. Other areas have little influence over patient experience. This suggests a gap in patients' perspectives on health care, which has policy implications for patient education.

Key Words. Patient experience, service quality, GP practice

Patient experience is a measure of health care quality focused on how staff and facilities interact with patients to deliver care. It is a measure of functional quality, separate from clinical care and outcome quality, although there is evidence that it correlates with health outcomes (Meterko et al. 2010; Doyle, Lennox, and Bell 2013; Anhang Price et al. 2014b). One of the key uses of patient experience data is to measure the quality of health care services and

compare service providers (NICE 2012; Ahmad, Burt, and Roland 2014), with the aim of maintaining and improving quality.

In primary care settings, standardized patient experience surveys are used in a number of countries for public reporting and benchmarking, and to enable effective comparisons between different health care providers. In the United States, the CG-CAHPS (Clinician and Group Consumer Assessment of Healthcare Providers and Systems) survey fulfills this purpose, while the United Kingdom uses the GP (General Practitioner) Patient Survey. In addition to their prime role in public reporting and benchmarking, these surveys can be used to drive performance improvements in areas where poor results are obtained (Friedberg et al. 2011; Schlesinger, Grob, and Shaller 2015). However, there is evidence that physicians and health care managers are reluctant to use the findings from surveys for this purpose (Manary et al. 2013; Anhang Price et al. 2014a; Farrington et al. 2016). This is partly due to historic concerns over the validity of the data, overcome through extensive development over a number of years (for example, Solomon et al. 2005; Campbell et al. 2009; Drake et al. 2014; Davey et al. 2016) and, at least in part, because they do not really appreciate what needs to improve (Boiko et al. 2014). A clearer understanding of the specific areas of health care service quality that are most important in determining patient experience should help physicians to target their improvement efforts more effectively and this is what we aim to achieve in this study.

Service quality is recognized as a complex, multidimensional construct, which has seen considerable research over the last 30 years to understand the nature of these dimensions. Parasuraman, Zeithaml, and Berry (1988) and Parasuraman, Berry, and Zeithaml (1991) created the most commonly used tool for measuring service quality in the form of SERVQUAL, which is a survey based around measuring five distinct dimensions of service quality and considered to have applicability to any service environment, although their relative importance and nature may vary in different situations. These dimensions (TERRA dimensions) are as follows:

- Tangibles: physical facilities, equipment, and appearance of staff
- Empathy: caring, individualized attention to customers
- Reliability: accurate and dependable provision of services
- Responsiveness: help customers and provide a prompt service

- Assurance: courtesy and knowledge, ability to inspire confidence and trust (Parasuraman, Berry, and Zeithaml 1991).

It is now generally accepted that the TERRA dimensions are not generic and should change to suit the context, where required (e.g., Carman 1990; Martinez and Martinez 2010; Schembri and Sandberg 2011). There have also been criticisms that emphasis of the TERRA dimensions on functional processes means that they are too simplistic to capture the complexity of service quality effectively, as they do not measure technical or outcome quality (e.g., Brady and Cronin 2001; Dagger, Sweeney, and Johnson 2007). However, in the context of patient experience, which explicitly focuses on the functional quality of the care delivered (clinical care and outcome quality are measured separately), the exclusion of technical or outcome quality in the TERRA dimensions is less problematic.

Regardless of the criticisms, the TERRA dimensions have been widely used and tested as the basis for measuring service quality in health care (e.g., Andaeib 2001; Alden, Hoa, and Bhawuk 2004; Ramsaran-Fowder 2008; Alrubaiee and Alkaa'ida 2011; Purcarea, Gheorghe, and Petrescu 2013). Most of these studies have developed, extended, or modified the original TERRA dimensions to fit their specific context. However, the majority have done this in large institutions, such as hospitals; very few have focused on primary care in a practice setting and those which have used very small, or convenience, samples (e.g., Ramsaran-Fowder 2008). We have not found any research that attempts to develop dimensions of service quality in primary care using large-scale, robust, standardized survey data such as that found in the CG-CAHPS or GP Patient Survey.

Therefore, the aim of our paper was to determine conceptually and statistically robust dimensions of GP Practice health care service quality and identify which of these dimensions have the greatest influence on patient experience, to help physicians to target their improvement efforts on the areas which will have the biggest impact. Specifically, we address the following research questions:

- What service quality dimensions are specific and relevant to primary care delivered through Family/GP Practices?
- What are the relationships between the different dimensions of service quality and patient experience in Family/GP Practices?
- What is the relative importance of each dimension of service quality for improvement action at the level of the GP/Family Practice and nationally?

METHODS

Setting

Our study uses the results of the GP Patient Survey in England, which is similar to the CG-CAHPS survey in the United States. Health care in England is provided free at the point of delivery, through the National Health Service (NHS), and is structured so that the first point of access for patients for routine and nonemergency consultations is through their family physician (General Practice Physician, or GP). GPs normally work in General Practices (equivalent to Family Practices in the United States). Services provided by each Practice vary, but they typically include 10-minute consultations with patients, followed by either immediate diagnosis and treatment, or onward referral to a specialist to provide this service. Many practices also provide additional services, such as minor treatments, immunizations, or prevention screening and all act as the key point of contact for co-coordinating the care of their patients through other health and social care services (Baird et al. 2016).

Data

The GP Patient Survey is a national survey of English GP patients carried out twice per year, administered by Ipsos Mori on behalf of the UK's Department for Health. Its purpose is to provide a standardized, reliable, and directly comparable evaluation of patients' perceptions of their experiences at their GP Practice. The Survey comprises 13 areas of measurement, covering patient experience in GP Practices (including out of hours access) and NHS dentistry services, along with a number of health and demographic factors. The survey is modified annually, based on analysis and development of the questions previously set, along with issues which the Department of Health identify as being important to patients (Campbell et al. 2009; Ipsos Mori 2015a).

Our study focuses on the eight areas of the GP Patient Survey related to patient experience in GP Practices and uses the practice level results for 2014/15 (NHS 2015) to evaluate service quality and to establish the impact of service quality on patient experience.

The GP Patient Survey for this period was randomly distributed to around 2.6 million patients registered with the 7,918 NHS GP Practices throughout England, with 858,351 patients completing the survey, representing a 32.5 percent response rate (Ipsos Mori 2015b). We used the weighted results. These incorporate all results but weight them to ensure they are

representative of the population (size and demographics) of patients in each practice (NHS 2015).

A typical GP Practice in England comprises four-five GPs, two-three nurses, and eight nonclinical and administrative staff, servicing around 7,250 registered patients (HSCIC 2016; Baird et al. 2016). We used the percentage of positive responses by registered patients to each relevant question at each GP Practice, as our unit of analysis. Therefore, the analysis is based on aggregated practice scores, rather than individual patient scores.

The Dimensions of GP Practice Health Care Service Quality

The TERRA dimensions were used as the starting point for the development of specific GP Practice health care service quality dimensions over three stages: An expert panel approach was stage 1, while stages 2 and 3 used successive statistical analyses to refine these into robust dimensions.

In stage 1, an expert panel comprising seven academic researchers based at UK universities were selected based on their expertise in service quality and in particular how it is measured. A nonmedical panel was selected, to ensure that the participants were focused only on the service quality aspects of the GP Patient Survey and were not concerned with the clinical rationale for asking them.

The panel comprised one professor, two associate professors, and two lecturers/senior lecturers in operations management, along with two research fellows in service operations/service research. All were active researchers in the area of service quality. They were based in five universities in the United Kingdom: London Business School, Exeter University, Plymouth University, Bath Spa University, and University of Portsmouth.

The GP Patient Survey data comprise 27 variables over eight areas of measurement relevant to service quality, covering all aspects of patient experience, including access to services, waiting times, interactions with medical staff, and care planning. The expert panel used a modified Delphi Technique (Sekaran and Bougie 2010), to determine conceptually appropriate service quality dimensions for the relevant GP Patient Survey variables. Two rounds of consultation led to agreement. The first round used a standard online form to classify each of the 27 variables into one of the five TERRA dimensions or suggest alternative dimensions, with the opportunity to comment on their choices as required. After the first round,

panel members were sent a personalized second form, asking them to revisit areas where there was disagreement. To facilitate this, the results of the first round were disseminated to show the level of agreement between the panel members.

Stage 2 aimed to develop statistically robust dimensions from the stage 1 Expert Panel data. Principle component analysis (PCA) was carried out in SPSS, on the 27 original variables. Orthogonal varimax rotation was used to maximize variance and ensure clarity between the components. This analysis helped to expose the underlying structure of the variables in the survey. To ensure clear distinction between the components, loadings below 0.3 were suppressed and, where a variable loaded on to more than one component, only the largest loading was retained. The dimensions from stage 1 were then mapped against these statistical components. Where components and dimensions aligned, they were retained. Where dimensions were split across components, or vice-versa, the dimensions were split accordingly.

Stage 3 tested the dimensions which emerged from stage 2 for statistical integrity, looking first for collinearity between the dimensions and then reliability within them. Collinearity was tested for using the variance inflation factor (VIF), with VIF values >5 indicating problematic collinearity between dimensions (Hutcheson and Sofroniou 1999). Cronbach's alpha coefficients were also calculated for each dimension with coefficients >0.7 considered sufficient to demonstrate reliable scales (Nunnally 1978).

Once the final GP Practice health care service quality dimensions were confirmed at the end of stage 3, the variables making up each dimension were averaged to create composite independent variables of service quality for each practice.

The final stage of the study used regression analysis to establish the impact of each of the newly created independent variables on patient experience. Two dependent variables were identified in the GP Patient Survey; an overall measure of patient experience and the willingness of patients to recommend the practice. Again, the individual patient scores were aggregated by practice, with the data we used representing the percentage of positive responses to each question, in each practice. The dependent variables were entered in a single block, as all dimensions were assumed to be equally theoretically important. This resulted in a single, statistically significant, and well-fitting regression model for each dependent variable.

RESULTS

The Relationship between Reported Factors and Service Quality Dimensions

The first round of the Expert Panel showed limited overall congruence in how the 27 variables were categorized into the TERRA (or other, emergent) dimensions, with only one of the variables categorized identically by all seven panel members. After the second round, 12 variables achieved full agreement between panel members and all but one other variable achieved at least a majority consensus. This last asked about the level of confidence the patient had in managing his or her own health. As this could not be classified conceptually as a dimension of service quality, it was rejected due to its ambiguity. Table 1 shows the number of panel members who classified the variables into each dimension after the final round of the expert panel. Four of the original five TERRA dimensions surfaced from the expert panel and were used in the subsequent analysis; empathy, reliability, responsiveness, and assurance, combined with a new emergent dimension, information. These are labeled stage 1 dimensions. “Tangibles” does not appear to be measured by the GP Patient Survey.

Mapping the stage 1 dimensions onto the results of the PCA enabled us to refine them, based on the actual results from the survey. The PCA revealed five influential components, which together accounted for just over 79 percent of the variance between the variables (see Table 2).

When the stage 1 dimensions were mapped onto these statistical components, it was clear that some components measured two, or even three, dimensions of service quality. In addition, some dimensions spanned several different components. The mapping showed clearly that the dimensions of empathy, assurance, and responsiveness are not discrete measures in GP Practices, as respondents score these dimensions differently depending on who they are interacting with. These dimensions were therefore divided between GP, nurse, and the out of hours (OOH) service.

Three variables from the survey, which had been categorized as empathy by the expert panel, were not statistically aligned with other responses categorized as empathy. These variables related to opening times and care planning. Therefore, new dimensions of practice accessibility and care planning were created, meaning that there were now 11 stage 2 dimensions. Table 3 shows the results of the stage 2 mapping process.

The variance inflation factor (VIF) tests for these 11 stage 2 dimensions showed strong collinearity between nurse empathy and nurse assurance, OOH responsiveness and OOH assurance, and, to a lesser degree, GP

Table 1: Stage 1 Classification of the Variables into Dimensions of Service Quality after Two Rounds of the Expert Panel

<i>Variables from GP Patient Survey</i>	<i>Stage 1 Dimensions</i>					
	<i>Tan.</i>	<i>Rel.</i>	<i>Res.</i>	<i>Ass.</i>	<i>Emp.</i>	<i>Inf.</i>
Had enough support from local services to manage long-term health conditions		4			2	1
Receptionists helpful			7			
Easy getting through to someone on the phone			7			
Convenient appointment			7			
Able to get an appointment to see or speak to someone			7			
Don't normally have to wait too long in practice		2	4		1	
Easy contacting OOH GP service by telephone			7			
Time to receive care from OOH GP service about right			7			
GP explained tests and treatments				6	1	
Confidence and trust in GP				7		
Confidence and trust in nurse				7		
Confidence and trust in OOH clinician				7		
Nurse explained tests and treatments				6		1
GP listened to you				1	6	
GP involves you in decisions about your care		1			6	
GP treats you with care and concern					7	
Nurse listened to you					7	
Nurse involved you in decisions about your care				1	6	
Nurse treats you with care and concern					7	
Satisfied with opening hours		2			5	
GP practice open at convenient times		2			5	
Usually see preferred GP			1		4	2
GP gave you enough time		1		1	5	
Nurse gave you enough time			1	1	5	
Have a written care plan	1	1			4	1
Know how to contact OOH service		1				6

Empathy and GP assurance. These dimensions had clear conceptual links and so it was possible to combine and rename them. Cronbach's alpha tests confirmed the scale integrity of the final eight dimensions. Table 4 shows the results of the statistical integrity tests leading to these final dimensions.

The combined results of the expert panel, PCA, collinearity, and reliability tests resulted in eight GP Practice health care service quality dimensions consistent with patient experience and service quality theory:

1. GP interactions (empathy and assurance)
2. Nurse interactions (empathy and assurance)
3. Reliability

Table 2: Exploratory PCA Components, with Loadings

<i>Variables from GP Patient Survey</i>	<i>PCA Rotated (varimax) Components</i>				
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
GP gave you enough time	0.836				
GP listened to you	0.875				
GP explained tests and treatments	0.868				
GP involves you in decisions about your care	0.841				
GP treats you with care and concern	0.878				
Confidence and trust in GP	0.816				
Usually see preferred GP	0.379				
Had enough support from local services to manage long term health conditions	0.379				
Confidence that can manage own health	0.560				
Nurse gave you enough time		0.902			
Nurse listened to you		0.914			
Nurse explained tests and treatments		0.899			
Nurse involved you in decisions about your care		0.861			
Nurse treats you with care and concern		0.899			
Confidence and trust in nurse		0.863			
Know how to contact OOH service					
Easy getting through to someone on the phone			0.795		
Receptionists helpful			0.689		
Able to get an appointment to see or speak to someone			0.662		
Convenient appointment			0.552		
Don't normally have to wait too long in practice			0.704		
Satisfied with opening hours			0.726		
GP practice open at convenient times			0.707		
Easy contacting OOH GP service by telephone				0.973	
Time to receive care from OOH GP service about right				0.969	
Confidence and trust in OOH clinician				0.972	
Have a written care plan					-0.883
Cronbach's alpha for each component	0.903	0.961	0.905	0.975	n/a

4. Information
5. Practice accessibility
6. Practice responsiveness
7. Care planning
8. OOH service quality (responsiveness and assurance)

The Influence of Service Quality Dimensions on Patient Experience

The results of the regression analysis of the new GP dimensions against the two patient experience measures are presented in Table 5.

Table 3: Stage 2 Dimensions Combining the Conceptual and Statistical Analysis

<i>Scale Components</i>	<i>PCA Components</i>	<i>Stage 1 Dimensions</i>	<i>Stage 2 Dimensions</i>
GP listens to you	Component 1	Empathy	GP empathy
GP involves you in decisions about your care	Component 1	Empathy	
GP treats you with care and concern	Component 1	Empathy	
GP gave you enough time	Component 1	Empathy	
Usually able to see preferred GP	Component 1	Empathy	GP assurance
GP explained tests and treatments	Component 1	Assurance	
Have confidence and trust in GP	Component 1	Assurance	
Had enough support from local services/ orgs to manage long term health conditions	Component 1	Reliability	Reliability
Nurse gave you enough time	Component 2	Empathy	Nurse empathy
Nurse listens to you	Component 2	Empathy	
Nurse involves you in decisions about your care	Component 2	Empathy	
Nurse treats you with care and concern	Component 2	Empathy	Nurse assurance
Nurse explained tests and treatments	Component 2	Assurance	
Have confidence and trust in nurse	Component 2	Assurance	
Know how to contact OOH service	Component 2	Other	Information
Satisfied with practice opening hours	Component 3	Empathy	Practice
Practice open at convenient times	Component 3	Empathy	Accessibility
Receptionist helpful	Component 3	Responsiveness	Practice Responsiveness
Easy to get through to practice by phone	Component 3	Responsiveness	
Convenience of appointment	Component 3	Responsiveness	
Able to get appointment or speak to someone	Component 3	Responsiveness	
Don't normally have to wait too long in practice	Component 3	Responsiveness	
Easy to call OOH service	Component 4	Responsiveness	OOH
Time to receive care from OOH service fine	Component 4	Responsiveness	Responsiveness
Have confidence and trust in OOH clinician	Component 4	Assurance	OOH assurance
Have written care plan	Component 5	Empathy	Care planning

The first model uses patients' overall experience of the GP Practice as the dependent variable. The second uses patients' willingness to recommend the practice as the dependent variable. Both models show that a high proportion of patient experience can be explained by the GP Practice service quality dimensions ($R^2 = 0.850$ for Model 1 and 0.775 for Model 2). They also show that the models are a good fit with the data and therefore robust ($F = 5587.272$ and 3410.242 , respectively, both significant to <0.001).

In both models, GP interactions ($b = 0.483$ and 0.679 , respectively) and Practice responsiveness ($b = 0.500$ and 0.601 , respectively) have the largest

Table 4: Stage 3 Statistical Integrity Checks, Resulting in Combining Some Dimensions

Stage 2 Dimensions	Cronbach's Alpha	VIF Values	Stage 3 Final Dimensions	VIF Values	Cronbach's Alpha
GP empathy	0.839	4.986	GP interactions	2.544	0.901
GP assurance	0.912	5.041			
Nurse empathy	0.977	14.241	Nurse interactions	1.904	0.983
Nurse assurance	0.945	14.681			
Reliability	n/a	1.423	Reliability	1.412	n/a
Information	n/a	1.633	Information	1.632	n/a
Practice accessibility	0.927	2.462	Practice accessibility	2.441	0.927
Practice responsiveness	0.867	3.040	Practice responsiveness	3.030	0.867
Care planning	n/a	1.023	Care planning	1.018	n/a
OOH responsiveness	0.959	12.683	OOH service quality	1.181	0.975
OOH assurance	n/a	12.645			

Notes. The gray shading is used to show that GP Empathy and GP Assurance were combined into a single dimension labeled "GP Interactions," based on the results of the statistical integrity checks; Nurse Empathy and Nurse Assurance were combined into a single dimension labeled "Nurse Interactions" based on the results of the statistical integrity checks; OOH Responsiveness and OOH Assurance were combined into a single dimension labeled "OOH Service Quality" based on the results of the statistical integrity checks.

Table 5: Regression of Final Dimensions of GP Practice Health Care Service Quality against Patient Experience Measures

GP Practice GP Practice Health Care Service Quality Dimensions	Model 1: Overall Experience of Practice			Model 2: Willingness to Recommend Practice		
	<i>b</i> (coeff.)	SE	<i>p</i> (sig.)	<i>b</i> (coeff.)	SE	<i>p</i> (sig.)
GP interactions	0.483	0.008	<.001	0.679	0.012	<.001
Nurse interactions	0.025	0.007	<.001	−0.062	0.010	<.001
Practice responsiveness	0.500	0.008	<.001	0.601	0.012	<.001
OOH service quality	0.011	0.001	<.001	0.027	0.002	<.001
Practice accessibility	0.158	0.008	<.001	0.104	0.011	<.001
Care planning	−0.193	0.019	<.001	−0.234	0.028	<.001
Reliability	0.005	0.004	.258	0.001	0.006	.856
Information	−0.010	0.006	.059	−0.047	0.008	<.001

Overall experience of practice: $N = 7918$, $R^2 = 0.850$, Constant = -0.058 , $F = 5587.272$ /
Willingness to recommend Practice: $N = 7918$, $R^2 = 0.775$, Constant = -0.252 , $F = 3410.242$.

impact on service quality. Curiously, nurse interactions have only a tiny impact ($b = 0.025$ and -0.062 , respectively), while care planning has a negative impact ($b = -0.193$ and -0.234 , respectively). In both models, reliability is found not to be significant ($p = .258$ and $.856$, respectively), while in Model 1, information was also found not to make a significant impact on patient

experience ($p = .059$). While practice accessibility and OOH service quality were significant, the effects were small in both cases.

DISCUSSION

In this study, we have found that two dimensions of service quality (physician interactions and practice responsiveness) are responsible for a strong majority of the variation in patient experience. Other factors, such as nurse interactions, are neutral, while providing a care plan has a weak negative influence. These findings contribute to existing work on patient experience and lead to insights for improving primary care.

Practice responsiveness has a very strong influence on patient experience, in contrast with the fairly minor influence of practice accessibility. This suggests that patients discern between higher level, strategic issues, such as practice opening times (measured by the practice accessibility dimension), and local, more easily manageable issues, such as the convenience of an individual appointment or the helpfulness of staff (measured by Practice responsiveness). Thus, there is some evidence that patient experience is based, at least in part, on reasonable expectations of local service delivery and not by issues which are clearly outside of the control of staff met during the service encounter.

The difference in the impact on patient experience between nurse and GP interactions (covering empathy and assurance) is at odds with previous work. In this study, in every variable which applied to both GPs and nurses, the GPs' mean score was higher (average difference was 6.7 percent higher across all six common variables). In contrast, previous studies have shown similar quality of care and higher levels of satisfaction among patients who consulted with nurses rather than with doctors, with much of this difference attributed to the additional time nurses had to listen and explain treatments (Laurant et al. 2004; Martínez-González et al. 2014). A possible explanation for this discrepancy is that the previous studies were focused on higher level nursing encounters, typically with nurse practitioners, which constitute only 20 percent of nurses in UK practices (RCGP 2014). The vast majority of practice nurses provide traditional nursing activities such as routine treatments for minor injuries, or offering health advice, as well as conducting routine tests and vaccinations. It is unclear whether the advantages of additional time and a more relaxed, discursive atmosphere are present in these situations. Either way, it is evident that patients value their experiences with nursing staff very differently from their encounters with the physician.

Moving to the broader question of patient experience, the GP Practice health care service quality dimensions do appear successful in capturing information about the functional quality of patients' encounters with their GP Practice. Our analysis shows that 85 percent of the variance in patient experiences can be explained by the service quality dimensions measured. This helps to confirm the fact that patient experience is strongly influenced by service quality and can be measured using similar dimensions. There has been concern among physicians that patient experience is prejudiced by other aspects of care, such as the technical quality of care or the quality of health outcomes (Manary et al. 2013; Anhang Price et al. 2014a). However, our data do not support this. Instead, our findings support the idea that patients focus on functional processes as they do not have the skills to evaluate the technical quality of the care being delivered (Padma, Rajendran, and Lokachari 2010).

The eight final dimensions of GP Practice health care service quality follow the lead of Andaeab (2001) and Ramsaran-Fowder (2008) in developing context-specific dimensions of service quality, in this case based on a large and statistically robust national survey. These give a basis for analysis grounded in primary health care. Of the five original TERRA dimensions, only responsiveness and reliability were identified as dimensions of GP Practice service quality in this research. Empathy was a very broad dimension, consistent with the findings of Ramsaran-Fowder (2008). Assurance was not identified as a statistically distinct dimension and was combined with either the empathy or responsiveness dimensions to create emergent dimensions, based around specific encounters (Nurse, GP, OOH). The conceptual confusion surrounding assurance aligns with a long-standing criticism of the construct in the literature (e.g., Buttle 1996 and also, to a certain extent, Parasuraman, Berry, and Zeithaml 1991). Responsiveness emerged as a distinct dimension, suggesting conceptual clarity and appropriateness for measurement of GP practice service quality. The new dimensions, information and care planning, reflect elements important to the GP practice context, while the division between encounters reflects how patients evaluate their experiences. There is still room for development of these dimensions, based as they are in one country and on data which reflect only 85 percent of the variation.

Our study aimed to provide insight into the influence of different dimensions of service quality on patient experience, which can be useful in managing and improving health care in a general/family practice setting. The results offer a clear picture to inform improvement initiatives at the level of the GP Practice and which can inform national policy.

For the GP Practice, interactions with the physician and the responsiveness of the practice dominate patient experience evaluations. Improvements here will far outweigh other factors. This includes physician empathy and assurance, along with elements such as the ease of making appointments, waiting time in the practice, and the convenience of appointments. The domination of these factors almost to the exclusion of others highlights a second finding; patients evaluate different elements of the experience separately. Treatment by nurses and physicians, the booking process, and the out-of-hours service are distinct in patients' evaluations. Improvements can concentrate on separate factors rather than an integrated experience. Finally, these findings suggest patients' attitudes to their health may be limited in scope. Their evaluations center on the physician and exclude the nurse's role in providing treatment and the patients' own role in achieving health outcomes through their care plan. The response to having a care plan in our data is slightly negative. While the response to the care plan may reflect the presentations for which care plans are valuable; typically chronic issues, the patient evaluations appear to reflect a heavy reliance on the encounter with the physician. Guidance could be needed for patients before a more integrated approach to health care will be adopted.

At a policy level, this finding is also important. It is recognized that outcomes rely on the patient's own behavior (Hibbard and Greene 2013) and that treatment by nurses can be very effective for a range of presentations (Shum et al. 2000). The apparent focus on the physician reflected in this analysis suggests that policy makers should consider influencing patients' mindsets as well as provision. More broadly the implications of these findings are somewhat negative toward improvements in efficiency. In an environment of cost pressure, more treatment by nurses and nurse practitioners can aid efficiency and effectiveness (Horrocks, Anderson, and Salisbury 2002), while physician empathy and responsiveness can be time-consuming. Responsiveness of the practice, for example, providing access to convenient appointments, tends to be at odds with cost-efficiency. The results also raise potential questions around emerging national policy in the United Kingdom (Dyson 2014) to increase opening hours, the dimension seen here as practice accessibility. This has a relatively small positive influence. If this is reflected in other measures of patients' evaluations of health care, resource allocation may be better focused on other factors. More research would be welcome here. Similarly, initiatives responding to health care demand in the United States (see, for example, Chapman and Blash 2017; Kurtzman et al. 2017) could lead to diminished patient experience based on current evaluations.

Our analysis also provides insight into potential development of surveys for measuring patient experience in primary care. Reliability was the least

well-developed dimension in our expert panel classification. Statistically, it also has an insignificant effect on patient experience in our analysis. This suggests that reliability is poorly measured and difficult to separate from some of the other dimensions in the GP Patient Survey. Other research into GP health care has suggested that reliability is an important measure of service quality (Ramsaran-Fowder [2008], although Drain [2001] did not identify this dimension in his study on GP primary care). In our study, reliability explicitly included a focus on the ability to deliver services effectively *over time*, rather than simply being able to provide individual appointments over time. In a population with a growing incidence of chronic health problems (WHO, 2011), there is a growing case for developing variables to measure this construct more effectively.

The Tangibles dimension is not covered at all within the current GP Patient Survey. It is possible, however, that it may be captured in the CG-CAHPS survey, as this includes measures about whether specific tests or treatments were offered (AHRQ 2015); these variables are not included in the GP Patient Survey. There has been some debate about this dimension in the literature, with Parasuraman, Berry, and Zeithaml (1991) accepting that it is complex and multifaceted, while others (e.g., Chowdhary and Prakash 2007) suggest that it becomes more important in services that process people, rather than possessions. As services offered at GP surgeries are clearly people-processing services, the omission of any variables from the survey that measures this dimension is unfortunate.

Limitations

We consider our research to be both robust and useful; however, we acknowledge some specific limitations to our work. First, our data explicitly ignored patient-level data, focusing on the aggregated results in each practice. This meant that we were unable to consider the impact of demographic influences, or of current health status, on patient experiences. We also treated each practice in the same way, although we understand that in reality practices vary considerably, from individual GPs in rural locations, to large, city center, multipartner practices, which may employ 10 or more physicians and many other medical and nonmedical staff. Although the data we used were weighted to account for the considerable size and demographic differences between GP Practices in England, we think that exploring the impact these differences make would be an interesting area for future research. Finally, we focused our work on the GP Patient Survey, which is delivered across England. Therefore,

while our results are useful and statistically robust, they only reflect this context and this particular survey. Future research could usefully extend this research to international contexts, to determine whether the drivers of patient experience we have identified here can be used elsewhere.

CONCLUSION

Patient experience of primary care is used extensively to compare health care providers, and there is growing evidence that patient experience correlates with health outcomes. Surveys at a national level are providing increasingly reliable datasets on patient experience, but these have proved difficult to interpret to direct improvement. Our study demonstrates that existing work on dimensions of service quality can be used as a basis for understanding patient experience data and informing improvement at a practice and a national level. In the case of English health care providers, patient experience was dominated by just two dimensions: interactions with the GP and responsiveness of the practice. To improve immediate patient experience, these dimensions should be the focus of attention. More broadly these results suggest that patient evaluations may be limited and patients may undervalue aspects of their health care, such as care planning, which are important for treatment. If confirmed, this has important implications for patient information and education. Further work applying similar analysis to other large datasets such as CG-CAHPS would usefully extend knowledge beyond the context of this study.

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Appendix SA1: Author Matrix.