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

Mel Hudson Smith and David Smith

Abstract

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 8 service quality dimensions identified, 6 have statistically significant impacts on patient experience but only 2 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 healthcare, 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.

Keywords

Patient Experience; Service quality; GP Practice.

Patient experience is a measure of healthcare 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 but there is evidence that it correlates with health outcomes (Doyle, Lennox and Bell, 2013; Meterko et al, 2010, Anhang Price et al, 2014b). One of the key uses of patient experience data is to measure the quality of healthcare services and compare service providers (NICE, 2012; Ahmad et al, 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 healthcare providers. In the US, the CG-CAHPS (Clinician and Group Consumer Assessment of Healthcare Providers and Systems) survey fulfils this purpose, whilst the UK uses the GP (General Practice) 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 (Farrington et al, 2016; Anhang Price et al, 2014a; Manary et al, 2013). 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) 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 healthcare 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 paper.

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, 1991) created the most commonly used tool for measuring service quality in the form of SERVQUAL, which is a survey based around measuring 5 distinct dimensions of service quality, considered to have applicability to any service environment, though their relative importance and nature may vary in different situations. These dimensions (TERRA dimensions) are;
- 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, Zeithaml, Berry, 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 & Martinez, 2010; Schembri & Sandberg, 2011). There have also been criticisms that emphasis of the TERRA dimensions on functional processes mean 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, 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 healthcare (e.g. Andaleeb, 2001; Alden, Hoa, Bhawuk, 2004; Ramasaran-Fowder, 2008; Alrubaiee and Alkaa'ida, 2011; Purcarea, Gheorghea, 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. Ramasaran-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 is to determine conceptually and statistically robust dimensions of GP Practice healthcare 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 US. Healthcare 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 non-emergency consultations is through their family physician (General Practice Physician, or GP). GPs normally work in General Practices (equivalent to Family Practices in the US). Services provided by each Practice vary, but 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 8 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 7918 NHS GP Practices throughout England, with 858,351 patients completing the survey, representing a 32.5% 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 4-5 GPs, 2-3 nurses and 8 non-clinical and administrative staff, servicing around 7250 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 Healthcare Service Quality
The TERRA dimensions were used as the starting point for the development of specific GP Practice healthcare 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 non-medical 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, two research fellows in Service Operations/ Service Research. All were active researchers in the area of service quality. They were based in 5 universities in the UK: London Business School, Exeter University, Plymouth University, Bath Spa University, and University of Portsmouth.
The GP Patient Survey data comprises 27 variables over 8 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 & 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 5 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 healthcare 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 7 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 their 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 evolved 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.

Table 1: Stage 1 classification of the variables into dimensions of service quality after two rounds of the Expert Panel

Variables from GP Patient Survey	Stage 1 Dimensions					
	Tan.	Rel.	Res.	Ass.	Emp.	Inf.
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 & 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
~~Confidence that can manage own health~~		~~1~~			~~3~~	~~3~~

Table 2: Exploratory PCA components, with loadings

Variables from GP Patient Survey	PCA Rotated (varimax) Components				
	1	2	3	4	5
GP gave you enough time	.836				
GP listened to you	.875				
GP explained tests & treatments	.868				
GP involves you in decisions about your care	.841				
GP treats you with care and concern	.878				
Confidence and trust in GP	.816				
Usually see preferred GP	.379				
Had enough support from local services to manage long term health conditions	.379				
Confidence that can manage own health	.560				
Nurse gave you enough time		.902			
Nurse listened to you		.914			
Nurse explained tests and treatments		.899			
Nurse involved you in decisions about your care		.861			
Nurse treats you with care and concern		.899			
Confidence and trust in nurse		.863			
Know how to contact OOH service					
Easy getting through to someone on the phone			.795		
Receptionists helpful			.689		
Able to get an appointment to see or speak to someone			.662		
Convenient appointment			.552		
Don't normally have to wait too long in practice			.704		
Satisfied with opening hours			.726		
GP practice open at convenient times			.707		

Easy contacting OOH GP service by telephone				.973
Time to receive care from OOH GP service about right				.969
Confidence and trust in OOH clinician				.972
Have a written care plan					-.883
Cronbach's Alpha for each component	.903	.961	.905	.975	n/a

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 5 influential components, which together accounted for just over 79% 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 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 added, meaning that there were now 11 stage 2 dimensions. Table 3 shows the results of the stage 2 mapping process.

Table 3: Stage 2 dimensions combining the conceptual and statistical analysis

Scale Components	PCA Components	Stage 1 Dimensions	Stage 2 Dimensions
GP listens to you	Component 1	Empathy	
GP involves you in decisions about your care	Component 1	Empathy	GP 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 explained tests and treatments	Component 1	Assurance	GP 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
Confidence that can manage own health	Component 1	ambiguous	n/a - reject
Nurse gave you enough time	Component 2	Empathy	
Nurse listens to you	Component 2	Empathy	Nurse Empathy
Nurse involves you in decisions about your care	Component 2	Empathy	
Nurse treats you with care and concern	Component 2	Empathy	
Nurse explained tests and treatments	Component 2	Assurance	Nurse 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	
Easy to get through to practice by phone	Component 3	Responsiveness	Practice
Convenience of appointment	Component 3	Responsiveness	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 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 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 8 dimensions. Table 4 shows the results of the statistical integrity tests leading to these final dimensions.

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	.839	4.986	GP Interactions	2.544	.901
GP Assurance	.912	5.041			
Nurse Empathy	.977	14.241	Nurse Interactions	1.904	.983
Nurse Assurance	.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	.927	2.462	Practice Accessibility	2.441	.927
Practice responsiveness	.867	3.040	Practice responsiveness	3.030	.867
Care planning	n/a	1.023	Care planning	1.018	n/a
OOH Responsiveness	.959	12.683	OOH Service Quality	1.181	.975
OOH Assurance	n/a	12.645			

The combined results of the expert panel, PCA, collinearity and reliability tests resulted in 8 GP Practice healthcare service quality dimensions consistent with patient experience and service quality theory:
1) GP Interactions (Empathy & Assurance)
2) Nurse Interactions (Empathy & Assurance)
3) Reliability
4) Information
5) Practice Accessibility
6) Practice Responsiveness
7) Care Planning
8) OOH Service Quality (Responsiveness & 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.

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 = .850 for Model 1 and .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 <.001).

In both models, GP Interactions (b=.483 & .679 respectively) and Practice Responsiveness (b=.500 & .601 respectively) have the largest impact on service quality. Curiously, Nurse Interactions have only a tiny impact (b=.025 & -.062 respectively), while Care Planning has a negative impact (b=-.193 & -.234

respectively). In both models, Reliability is found not to be significant (p=.258 & .856 respectively), while in Model 1, Information was also found not to make a significant impact on patient experience (p=.059). Whilst Practice Accessibility and OOH Service Quality were significant, the effects were small in both cases.

Table 5: Regression of final dimensions of GP Practice healthcare service quality against patient experience measures

GP Practice GP Practice Healthcare Service Quality Dimensions	Model 1: Overall experience of Practice			Model 2: Willingness to recommend Practice		
	b (coeff.)	S.E.	p (sig.)	b (coeff.)	S.E.	p (sig.)
GP Interactions	.483	.008	<.001	.679	.012	<.001
Nurse Interactions	.025	.007	<.001	-.062	.010	<.001
Practice Responsiveness	.500	.008	<.001	.601	.012	<.001
OOH Service Quality	.011	.001	<.001	.027	.002	<.001
Practice Accessibility	.158	.008	<.001	.104	.011	<.001
Care Planning	-.193	.019	<.001	-.234	.028	<.001
Reliability	.005	.004	.258	.001	.006	.856
Information	-.010	.006	.059	-.047	.008	<.001

Overall experience of Practice: N=7918 R^2=.850 Constant= -.058 F=5587.272 / Willingness to recommend Practice: N=7918 R^2=.775 Constant=-.252 F=3410.242

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% higher across all 6 common variables). In contrast, previous studies have shown similar quality of care and higher levels of satisfaction amongst 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% 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 healthcare service quality dimensions do appear successful in capturing the information about the functional quality of patients' encounters with their GP Practice. Our analysis shows that 85% 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, 2014). However, our data does not support this. Instead, our findings support the idea that patients focus more on functional processes as they do not have the skills to evaluate the technical quality of the care being delivered. (Padma et al, 2010).

The 8 final dimensions of GP Practice healthcare service quality follow the lead of Andaleeb (2001) and Ramasaran-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 Ramasaran-Fowder (2008). Assurance was not identified as a statistically distinct dimension and was combined with either 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, Zeithaml and Berry, 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 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 reflects only 85% 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 healthcare 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 towards improvements in efficiency. In an environment of cost pressure, more treatment by nurses and nurse practitioners can aid efficiency and effectiveness (Horrocks, Anderson, 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 UK (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 healthcare, resource allocation may be better focused on other factors. More research would be welcome here. Similarly initiatives responding to healthcare demand in the US (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 healthcare has suggested that Reliability is an important measure of service quality (Ramsaran-Fowdar, (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 strong 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 the this dimension in the literature, with Parasuraman, Zeithaml and Berry (1991) accepting that it is complex and multi-faceted, whilst others (e.g. Chowdhary & Prakash, 2007) suggest 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 measuring this dimension, is unfortunate.

Limitations
We consider our research to be both robust and useful, however, we acknowledge some specific limitations to our work. Firstly, 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 centre, multi-partner practices, which may employ 10 or more physicians and many other medical and non-medical staff. Although the data we used was 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, whilst 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 healthcare providers and there is growing evidence that patient experience correlates with health outcomes. Surveys at a national level are providing increasingly reliable data sets on patient experience, but these have proved difficult to interpret to direct improvement. Our study demonstrates that existing work in 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 healthcare 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 under value 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 data sets such as CG-CAHPS would usefully extend knowledge beyond the context of this study.

References
Ahmad, F. Burt, J. Roland, M. (2014) "Measuring Patient Experience: Concepts and Methods" *Patient* Vol.. 7, pp235-241.

AHRQ (2015) CAHPS Clinician and Group Survey and Instructions, available at https://www.ahrq.gov/sites/default/files/wysiwyg/cahps/surveys-guidance/cg/about/cg_3-0_overview.pdf (accessed 31/03/2017)

Alden, D. Hoa, D.M. Bhawuk, D. (2004) "Client satisfaction with reproductive health-care quality: integrating business approaches to modeling and measurement," *Social Science & Medicine,* Vol. 59, pp2219–2232

Alrubaiee, L. Alkaa'ida, F. (2011) "The Mediating Effect of Patient Satisfaction in the Patients' Perceptions of Healthcare Quality – Patient Trust Relationship," *International Journal of Marketing Studies*, Vol. 3(1), pp103-127.

Andaeeb, S. (2001) "Service Quality Perceptions and Patient Satisfaction: A Study of Hospitals in a Developing Country," *Social Science & Medicine*, Vol. 52, pp1359-1370.

Anhang Price, R. Elliott, M. Cleary, P. Zaslavsky, A. Hays, R. (2014a) "Should Healthcare Providers be Accountable for Patients' Care Experiences?" *Journal of General Internal Medicine*, Vol 30(2), pp253-256.

Anhang Price, R., Elliott, M. N., Zaslavsky, A. M., Hays, R. D., Lehrman, W. G., Rybowski, L., Cleary, P. D. (2014b). Examining the Role of Patient Experience Surveys in Measuring Health Care Quality. *Medical Care Research and Review : MCRR*, *71*(5), 522–554. http://doi.org/10.1177/1077558714541480

Boiko O, Campbell J, Elmore N, Davey A, Roland M, Burt J. (2014) "The role of patient experience surveys in quality assurance and improvement: a focus group study in English general practice." *Health Expectations*, 2014; Vol.18, pp1982–1993.

Brady M. Cronin J. (2001) "Some New Thoughts on Conceptualizing Perceived Service Quality: A Hierarchical Approach" *The Journal of Marketing*, Vol. 65(3) pp34-49

Buttle, F. (1996),"SERVQUAL: review, critique, research agenda", *European Journal of Marketing*, Vol. 30(1), pp8-32

Campbell, J. Smith, P. Nissen, S. Bower, P. Elliott, M. Roland, M. (2009) "The GP Patient Survey for Use in Primary Care in the NHS in the UK – Development and Psychometric Characteristics," *BMC Family Practice*, Vol. 10, doi: 10.1186/1471-2296-10-57.

Carman, J. (1990) "Consumer Perceptions of Service Quality: An Assessment of the SERVQUAL Dimensions," *Journal of Retailing*, Vol. 66(1), pp33-55.

Chapman, S.A. and Blash, L.K., 2017. New Roles for Medical Assistants in Innovative Primary Care Practices. *Health Services Research*, 52, pp.383–406.

Chowdhary, N. Prakash, M. (2007),"Prioritizing service quality dimensions", *Managing Service Quality: an International Journal*, Vol. 17(5) pp493-509.

Dagger, T., Sweeney, J. and Johnson, L. (2007), "A hierarchical model of health service quality: scale development and investigation of an integrated model", *Journal of Service Research*, Vol. 10(2), pp123-42.

Davey, A.F., Roberts, M.J., Mounce, L., Maramba, I. and Campbell, J.L., 2016. Test–retest stability of patient experience items derived from the national GP patient survey. *SpringerPlus*, [online] 5(1). Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5055510/> [Accessed 31 Mar. 2017]

Doyle C, Lennox L, Bell D (2013) "A systematic review of evidence on the links between patient experience and clinical safety and effectiveness" *BMJ Open* doi: 10.1136/bmjopen-2012-001570

Drain, M. (2001), "Quality improvement in primary care and the importance of patient perceptions", *Journal of Ambulatory Care Management*, Vol. 14(2), pp30-46.

Drake, K. M., Hargraves, J. L., Lloyd, S., Gallagher, P. M., & Cleary, P. D. (2014). The Effect of Response Scale, Administration Mode, and Format on Responses to the CAHPS Clinician and Group Survey. *Health Services Research*, *49*(4), 1387–1399. http://doi.org/10.1111/1475-6773.12160

Dyson B. (2014). Improving general practice – phase one report, March 2014 *NHS England* Available at: https://www.england.nhs.uk/wp-content/uploads/2014/03/emerging-findings-rep.pdf (Accessed 31/03/2017)

Farrington, C., Burt, J., Boiko, O., Campbell, J. and Roland, M. (2016), "Doctors' engagements with patient experience surveys in primary and secondary care: a qualitative study." *Health Expectations* doi:10.1111/hex.12465

Friedberg, M. SteelFisher, G. Karp, M., & Schneider, E. (2011). Physician Groups' Use of Data from Patient Experience Surveys. *Journal of General Internal Medicine*, Vol*26*(5), pp498–504. http://doi.org/10.1007/s11606-010-1597-1

Hibbard J. Greene J. (2013) "What the Evidence Shows about Patient Activation: Better Health Outcomes And Care Experiences; Fewer Data On Costs" *Health Affairs* 32, no.2 (2013):207-214 doi: 10.1377/hlthaff.2012.1061

Horrocks, S. Anderson, E. Salisbury, C. (2002) "Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors" *BMJ* 2002; 324 :819

HSCIC (2016) "General and Personal Medical Services, England; 2005-2015 Provisional Experimental Statistics, Health & Social Care Information Centre, available from http://content.digital.nhs.uk/catalogue/PUB20503/nhs-staf-2005-2015-gene-prac-rep.pdf (accessed 31/03/2017)

Hutcheson, G.D. Sofroniou, N. (1999). *Multivariate social scientist: Introductory statistics using generalized linear models*. Sage, London.

Ipsos Mori (2015a) GP Patient Survey 2015 Technical Annex, available from: http://gp-survey-production.s3.amazonaws.com/archive/2015/July/14-008280-01_Technical%20Annex%202014-2015.pdf (accessed 31/03/2017)

Ipsos Mori (2015b) GP Patient Survey National Summary Report, http://gp-survey-production.s3.amazonaws.com/archive/2015/July/July 2015 National Summary Report.pdf (accessed 31/03/2017).

Kurtzman, E. Barnow, B. Johnson, J. Simmens, S. Infeld, D. Mullan, F. (2017) Does the Regulatory Environment Affect Nurse Practitioners' Patterns of Practice or Quality of Care in Health Centers? *Health Services Research*, 52, pp.437–458.

Laurant M. Reeves D. Hermens R. Braspenning J. Grol R. Sibbald B. (2004) "Substitution of doctors by nurses in primary care,. *Cochrane Database of Systematic Reviews 5*, CD001271.

Manary, M. Boulding, W. Staelin, R. Glickman S. (2013) "The Patient Experience and Health Outcomes" *New England Journal of Medicine*, 368:3 pp201-203.

Martínez-González NA, Djalali S, Tandjung R, Huber-Geismann F, Markun S, Wensing M, Rosemann T. (2014) "Substitution of physicians by nurses in primary care: a systematic review and meta-analysis". *BMC Health Service Research,* May, pp14-214.

Martinez, J. Martinez, L. (2010) "Some Insights on Conceptualising and Measuring Service Quality" *Journal of Retailing and Consumer Services*, Vol. 17, pp29-42.

Meterko M, Wright S, Lin H, Lowy E, Cleary PD. (2010) "Mortality among patients with acute myocardial infarction: the influences of patient-centered care and evidence-based medicine." *Health Services Research*. Vol.45(5 Pt 1), pp1188–1204.

NHS (2015) http://gp-survey-production.s3.amazonaws.com/archive/2015/July/ weighted/ July%202015%20Practice%20Report%20weighted.xls (accessed 31/03/2017)

NICE (2012) Patient Experience in Adult NHS Services http://guidance.nice.org.uk/qs15 (access 31/032017)

Nunnally, J. (1978) *Psychometric Theory (2nd Ed),* New York, McGraw Hill.

Padma, P. Rajendran, C. Lokachari, PS. (2010) "Service quality and its impact on customer satisfaction in Indian hospitals: Perspectives of patients and their attendants", *Benchmarking: An International Journal*, Vol. 17(6), pp.807-841

Parasuraman, A. Zeithaml, V. Berry, L.L. (1985) "A Conceptual Model of Service Quality and its Implications for Future Research" *Journal of Marketing*, Vol. 49, Fall, pp41-50.

Parasuraman, A. Zeithaml, V. Berry, L. (1988) "SERVQUAL: A Multiple Item Scale for Measuring Customer Perceptions of Service Quality," *Journal of Retailing*, Vol. 64(1), pp12-40.

Parasuraman, A. Berry, L. Zeithaml, V. (1991) "Refinement and Reassessment of the SERVQUAL Scale," *Journal of Retailing*, Vol. 69(4), pp420-460.

Purcarea, V. Gheorghea, I. Petrescu, C. (2013). The Assessment of Perceived Service Quality of Public Health Care Services in Romania Using the SERVQUAL Scale. *Procedia Economics and Finance*, Vol. 6, pp573-585.

Ramsaran-Fowder, R. (2008) "The Relative Importance of Service Dimensions in a Healthcare Setting," *International Journal of Health Care Quality Assurance,* Vol. 21(1), pp104-124.

RCGP (2014) Overview of 2014 GP Nurse Survey Report http://www.rcgp.org.uk/membership/practice-team-resources/~/media/Files/Practice-teams/Overview of 2014 General Practice Nurse Survey Report.ashx (accessed 31/03/17)

Schembri, S. Sandberg, J. (2011) "The Experiential Meaning of Service Quality" *Marketing Theory*, Vol. 11, pp165-186.

Schlesinger, M., Grob, R. and Shaller, D. (2015), Using Patient-Reported Information to Improve Clinical Practice. Health Services Research, Vol.50, pp2116–2154. doi:10.1111/1475-6773.12420

Sekaran, U. Bougie, R. (2010) *Research Methods for Business* (5th Edition), Wiley, Chichester, UK.

Shum, C. Humphreys, A. Wheeler, D. Cochrane MA. Skoda, S. Clement S. (2000) "Nurse management of patients with minor illnesses in general practice: multicentre, randomised controlled trial" *BMJ* 320 :1038

Solomon, L.S., Hays, R.D., Zaslavsky, A.M., Ding, L. and Cleary, P.D., 2005. Psychometric properties of a group-level Consumer Assessment of Health Plans Study (CAHPS) instrument. *Medical Care*, 43(1), pp.53–60.

WHO (2011) Global Health and Ageing, World Health Organisation. http://www.who.int/ageing/publications/global_health.pdf (accessed 31/03/2017)