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Patient-doctor longitudinal care, depth of relationship and detection of patient psychological distress by general practitioners

Patient-doctor longitudinal care, depth of relationship and detection of patient psychological distress by general practitioners

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Abstract

Continuity of patient care is often described as a core value in general practice yet changes in primary care in the United Kingdom have eroded the traditional model of the patient seeing the same doctor and developing a relationship with them over time. Such patient-doctor continuity is especially valued by patients and GPs when, among other situations, the problem is psychological. However, evidence that continuity benefits patient care is limited, possibly because research has focused on its longitudinal rather than its interpersonal characteristics.

Using a previously described model of patient-doctor continuity, two hypotheses were tested. First, that longitudinal care and depth of relationship would be associated. Second, that patient-doctor continuity (in particular depth of relationship) would be associated with GP detection of patient psychological distress. A novel measure of patient-doctor depth of relationship was developed and psychometrically evaluated through ten pre-pilot interviews and two pilot rounds involving 529 participants. This measure was then used in a cross-sectional study of routine GP consultations.

Of the 643 eligible patients who attended the 31 participating GPs, 541 (84.1%) returned a questionnaire and 490 (76.2%) gave permission to review their medical records. An association between the number of encounters between patient and study GP and the probability of having a deep relationship appeared to be curvilinear, with an average odds ratio of 1.5 (95% CI 1.2 to 1.8). However, neither depth of relationship nor longitudinal care were associated with GP detection of psychologically distressed patients, as defined by the General Health Questionnaire (GHQ). Indeed, patient-doctor continuity appeared to be associated with GP over-reporting of psychological distress.

The causality of the association between patient-doctor longitudinal care and depth of relationship, and the value of depth of relationship to patients with psychological problems, warrants further investigation.

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This thesis is dedicated to my family – Rachel (who remembers life before the fellowship) and Jacob and Evan (who have only ever known their father as a PhD student).

Author's declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED:

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1. Introduction

The author decided to investigate continuity of care in general practice in the United Kingdom (UK). This introductory chapter begins by providing some background information on how continuity of patient care, or just continuity for short, is an important aspect of primary care and how traditional models of patient-doctor continuity have been challenged. It then goes on to give a chapter-by-chapter overview of the rest of the thesis.

1.1 Background

1.1.1 General practice and continuity of care

General practice, also referred to internationally as family practice or family medicine, is the main provider of primary care in the UK. There is no universally agreed definition of either the speciality or the job of the general practitioner (GP), but two descriptions come from the World Organisation of Family Doctors (WONCA) and the Royal College of General Practitioners (RCGP). WONCA characterises family medicine as care that is first contact, person-centered, longitudinal, comprehensive, coordinated and holistic; by doctors who engage in health promotion and have a responsibility to the community.[1] An influential definition published by RCGP in 1969 defined the GP as a doctor who provided "personal, primary, and continuing care".[2] Continuity of patient care is therefore one of the core defining characteristics of general practice, and it is "part of the framework on which the ideology and teaching of family practice is based."[3]

Like general practice, there is no single agreed definition of continuity. It is a concept which has many facets, yet in primary care it is "mainly viewed as the relationship between a single practitioner and a patient that extends beyond specific episodes of illness or disease."[4] Alternative ways of thinking about continuity are discussed in more detail in the next chapter (see 2.4.1), and the inter-relationships between some of its dimensions are also considered in chapter three (see 3.2), but from the outset this thesis concentrates on patient-doctor continuity.

1. Introduction

Although continuity is recognised as an important attribute throughout healthcare, it has been seen as an "enduring strength" of primary care,[5] because of how the nature of the work differs from secondary care. McWhinney has argued that family medicine is primarily about the relationship with the patient and only secondarily about the delivery of medical care, consultation or services.[6] In contrast to hospital out-patient appointments, most consultations in general practice are patient initiated, conducted at a practice close to the patient's home, and for any problem – from acute self-limiting minor illnesses to chronic life-threatening disease. Indeed, pathophysiological diagnoses may not be possible in anything up to 50% of presenting patients.[7] GPs commonly manage many conditions in one patient, and any single problem may have complex psychological and social dimensions. Stimson and Webb[8] remind us that:

> *"People live their problems and illnesses socially; they cannot be viewed as isolated individuals responding automatically to the instructions of their doctors".*

Aside from their own technical skills and knowledge, the primary tools which the general practitioner employs to manage their patients are the consultation and time. The consultation is the "major medium" of medical care[9] but especially in primary care where the specialist diagnostic tests are either not available or are not appropriate for the problem presented. In term of making a diagnosis, using time as an aid to diagnosis (a "wait and see" approach) is particularly suited to general practice, because undiagnosed symptoms often spontaneously resolve.[10] However, it is asserted that the real value of time as a management tool to the GP is in the serial encounter of the same patient with the same doctor over time. Although the duration of the average consultation may be short, the total time accumulated for each patient over a typical year is more significant.[11] This is what many general practitioners would recognise as continuity of care, where the doctor is able to take account of the patient's personal and social outlook in the context of an on-going doctor-patient relationship.[12] The benefits of continuity are estolled by Periera Gray *et al*:

> *"In primary care a 'personal doctor' with accumulated knowledge of the patients' history, values, hopes and fears will provide better care than a similarly qualified doctor who lacks such knowledge; and the benefits of such continuity will include not only greater satisfaction for the patient but also more efficient consultations, better preventative care and lower costs."*[13]

Continuity of patient care is therefore a concept embedded in how primary care is defined and how many doctors think about the role of the general practitioner. Yet continuity and the personal doctor are thought to be under threat.

1.1.2 Continuity under threat?

Historically in the UK the general practitioner was the sole provider of general practice, but society and health care have changed.[14] The traditional model of a longitudinal relationship between patient and doctor has been eroded by a combination of organisational, patient and professional changes.

1.1.2.1 Organisational threats

Some doctors have argued that many of the NHS reorganisations relating to primary care have made the development of ongoing doctor-patient relationships less likely.[15] First, alternative sources of primary care have been introduced. Instead of contacting their local surgery, patients can now telephone NHS Direct or attend a Walk-In Centre. Pharmacists have also been given an expanded role.[16] The status quo of patients only being able to be registered with one GP at a time has been maintained, but new health centres established as part of the Lord Darzi review are being encouraged to see patients as temporary residents.[17] Second, reforms in the NHS have placed greater emphasis on provision of care through teams and shared clinical records.[15] Government policy has focused on consistency and coordination of care, rather than on patients seeing the same practitioner.[12] Commentators have complained that guidelines and care pathways are one means of trying to achieve this goal but in situations of complexity or uncertainty they cannot substitute for clinical judgement within an on-going relationship.[14] Third, government policy has centred on improving access to general practice, with a target of being able to see a doctor within 48 hours.[18] Changes in appointment systems to try and achieve this may reduce continuity.

1.1.2.2 Patient threats

Patients' expectations and needs are higher than in the past. The agenda in consultations has broadened and there has been an increase in patient consumerism.[19] The rise in chronic disease now means patients routinely receive care from multiple organisations and disciplines.[14] Within practices, patients with more than one chronic disease may be seen by several nurses who run different condition-specific clinics. The ageing population and the increased role for primary care in managing chronic diseases has meant the focus of general practice has shifted from treating acute conditions to preventative care and managing on-going illness.[20]

1.1.2.3 Professional threats

As part of the "transformation" of general practice, there has been a "hydribidisation" of primary care work,[21] in which nurses are increasingly taking on tasks once defined as medical. Practice nurses are now commonly employed to see patients with minor illnesess and long-term conditions. From an economic perspective transferring work from expensive doctors to less costly nurses is attractive.[22]

Doctors have also changed the way they work, partly in response to these demands but also for other reasons.[23] GPs are more likely to work in group practices, and even "singled handed" doctors are part of primary care teams with nursing and administrative support.[20] Group practices are more likely to operate shared (patient able to see any doctor) rather than personal (patient always sees the same doctor) "list" systems. Whereas a decade ago most GPs would have provided out-of-hours care for their own or their surgery's patients, the majority of care at evenings, nights and weekends is now provided by arrangements that cover many practices. [12] Doctors are more likely to work part-time and to take time out of surgeries for administrative, teaching or educational commitments.[24] Within practices there has been a move for GPs to develop specialist interests and outside of the practice GPs with specialist interest ("GPwSIs") have been increasingly employed to work in primary-secondary care interface clinics. Whilst these developments may bring benefits to patients and doctors alike, some have expressed concern that they will also further fragment care.[25]

The new GP contract,[26] voted for by doctors, which came into effect in 2004 has also had implications for continuity. First, it changed patient registration from a named doctor to the surgery. Second, it also introduced a series of performance-related quality indicators (Quality and Outcomes framework) by which practices were reimbursed for achieving certain organisational and disease management targets. Concern has been voiced that "not everything that counts can be counted; not everything that can be counted counts"[27] and that more holistic aspects of practice, such as continuity, have subsequently become neglected in favour of chasing measurable targets for financial reward.[28]

Lastly, as Dowrick[19] argues, there appears to have been a shift in how the patient-doctor relationship is viewed. Instead of it being assessed in terms of personal knowledge accumulated over a series of encounters, a greater emphasis has been placed on the quality of patient-doctor communication in isolated consultations.

1.1.3 Summary

In 1974, Becker *et al*[29] wrote:

> *"the need to provide continuity of care is a basic public health and medical care tenet . . . and a sine qua non to what is currently viewed as 'good' medical care."*

and traditionally continuity has been a defining characteristic of general practice. Reasons why it might be particularly important for managing the nature and breadth of problems encountered in primary care have been identified. However, changes at organisational, patient and professional levels have challenged the traditional model of patient-doctor continuity and there may have been a shift from relationship-based to communication skill-based consultations.

In 1960 Fox[30] observed:

> *"The more complex medicine becomes, the stronger are the reasons why everyone should have a personal doctor who will take continuous responsibility for him, and, knowing how he lives, will keep things in proportion – protecting him, if need be, from the zealous specialist."*

If this is true, then it is ironic that as patients with multiple health problems have become more common, they are less likely to see the same primary care professional for all of their health care problems. But how confident can we be that continuity as a core characteristic of general practice is anything more than professional rhetoric? Bower and colleagues[31] point out that the centrality of the patient-doctor relationship to general practice in the UK can be traced to 1960s when general practice emerged as an academic and differentiated discipline. Alternative ways of working may promise better patient care, but first one should be sure what the traditional model of patient-doctor continuity offers. What does the research tell us about the value of continuity to patients and providers?

1.2 Overview of thesis

The next chapter examines the literature in more detail to establish what is known about the value of continuity to patient care, including its effect on patient care. It establishes that although research generally favours continuity, it is strongest for patient satisfaction. Otherwise evidence of its impact on patient processes and outcomes is mixed. This may be partly because of problems in how continuity is defined and measured, and partly because research has not always focused on the types of patients or problems where it may have its biggest effect. Chapter three goes on to describe how these issues have been addressed in this thesis by first adopting a conceptual model of patient-doctor continuity to underpin the research, and second by setting-out why seeing the same doctor may matter to patients with mental health problems, in particular its possible role in the detection of patient psychological distress.

The thesis aims, objectives and hypotheses of the study are summarised in chapter four. Chapter five provides an overview of the two main parts of the research and their common components: ethical approval, geographical context and questionnaire design.

Chapter six describes the development of the patient-doctor depth of relationship questionnaire used in the main study to explore associations between longitudinal care, depth of relationship and GP detection of patient psychological distress. The methodology for this cross-sectional study is presented in chapter seven and the results in chapter eight.

Chapter nine discusses the methodology and possible explanations for the study's findings. The thesis concludes with chapter ten, discussing the implications for clinical practice and future research.

2. Continuity of patient care

2.1 Introduction

2.1.1 Scope

Continuity of patient care is a challenging topic to review. As a general concept, continuity is one of importance to all health care and there is a large body of literature that spans disciplinary and organisational boundaries.[4] However, it has already been established that continuity is highlighted as a core value in primary care, being closely aligned with the professional ethos that "the patient is important as an individual rather than for the diagnoses that may be attached to him/her."[32] The focus of this study, and hence this review of the literature, is patient-doctor continuity in UK general practice.

Studies of continuity vary in many respects, but for the purpose of this introductory chapter they have been presented in three parts. The first section examines the value patients and doctors attach to continuity, in principle and in practice. The second section reviews the evidence base for effects of continuity on health processes and outcomes. The third and final section of this chapter considers how continuity has been defined and measured. In doing this, the author has sought to move from the "What?", through the "So what?" to the "How?" and thereby identify the important issues that this study seeks to address – how continuity is conceptualised (and hence measured) and the reasons for assessing its value in a particular context.

2.1.2 Literature search

The majority of the literature included in this review was identified by searching a bibliography compiled by the author during six years of research in the field. This database comprised references for papers (reviews, original research, editorials and discussion articles in peer-reviewed journals), reports and books on continuity of patient care. This was supplemented by searches of OVID Medline using the keyword "continuity of care" and synonyms of "general practice", and personal enquiry of colleagues with similar research interests.

2.2 Continuity in principle and practice

This section explores more deeply the reasons why continuity is held as being so central to general practice. Research has characterised patient-doctor continuity from the perspectives of the component players. This is because patient and doctor may have different viewpoints, especially for example in how they balance continuity with other issues such as access.

This introduces the other key division that this section focuses on: continuity in principle and in practice. How is continuity valued in principle – who says continuity is important and why? And how in practice are these values applied – which patients get continuity and which practices provide it? How patients and doctors define continuity is returned to later (see 2.4.1.1).

2.2.1 Patients' perspective

Recent international surveys suggest that the majority of patients think that continuity is important.[33-35] Further detail is found in three main lines of research: how the value that patients attach to continuity varies with their personal characteristics and those of their practice; patients' reasons for valuing continuity (possible benefits and harms); and the characteristics of patients who receive continuity.

2.2.1.1 Which patients value continuity?

The key reference in this area is by Pandhi and Saultz, who in 2006 published a review of the literature on which patients value continuity and in what context.[36]

In terms of sociodemographic characteristics, continuity seems to be more valued by older people and women. Studies on differences between ethnic groups have been contradictory, whilst patients from urban areas may value seeing the same doctor more than people who live in rural areas.[37] Patient attitudes may also vary with broader personal characteristics. Continuity seems to be less important to those who see themselves as busy or characterize their lives as chaotic.[36] In 1992 Liaw *et al*[38] reported on a study that explore perceptions of continuity of care by patients from different socioeconomic backgrounds in Australia. In focus groups, participants from the lower socioeconomic groups emphasized access factors and importance of records whereas those from the middle class area emphasized interpersonal factors and were more likely to use their presenting problem as a criterion to decide whether they needed to postpone the problem to a time when they could see their personal doctor. However, a more recent cross-sectional survey in the UK by Kearley *et al*[33] failed to find any association between socioeconomic factors and the value that patients attached to continuity.

Patient health is strongly linked to the importance that patients attach to continuity. Several studies identify continuity as being important to patients with poor health, or chronic conditions or problems. Patients prefer to see a known doctor for problems that are on-going, complex, psychological or serious.[36] Similar postal questionnaires were conducted by Kearley *et al*[33] and Schers *et al*[39] in England and The Netherlands respectively, evaluating patient experience and views of personal care. Both were based in general practice and featured scenarios or "cameos" of minor and major clinical problems. The majority of patients in both studies rated having a personal GP as important, although it was rated more important for serious physical illness, psychological complaints and family problems. Schers and colleagues[39] reported that patients preferred their personal doctor chiefly because he was believed to have better medical and personal knowledge of them. In multiple linear regression analysis, 10-12% of the variance of these views on personal continuity was explained by patient characteristics.

In the UK patients are registered with a practice, and patient opinion about continuity has been associated with the type of "list" system that their practice operates. In combined list practices patients are not assigned to a specific doctor, whereas in personal list practices they are.[40] Personal list practices tend to have a stronger ethos toward booking patients with their "own" doctor, but combined list practices may still encourage the patients to see the same GP, even if it is limited to following-up a specific problem. Freeman and Richards[41] compared patients from two combined list practices with one that ran a personal list system and found that patients registered at the personal list practice valued seeing the same doctor more. Similarly Roland *et al*[42] reported that a higher proportion of patients in the personal list practices said that they preferred to see a particular doctor.

One interpretation of this observation is that in order for patients to value continuity, they may need to experience in first.[43] Further supporting evidence for this comes from work by Nutting *et al*[44] and Mainous *et al*.[45] Using data from the Direct Observation of Primary Care (conducted in Ohio between 1994 and 1995), they found that patients who valued continuity were more likely to have seen their regular physician on the index visit[44] and to have reported a longer duration of relationship with them.[44;45] Personal continuity is also more valued with increasing consultation frequency.[33;44] However, all of these aforementioned studies use cross-sectional data, and it is entirely plausible the relationship could be the other way around: patients who value continuity seek practices and doctors who can provide it.

2.2.1.2 What are the possible benefits?

Another way of looking at patient's attachment to continuity is to examine why it is sought. Brown *et al*[46] addressed this question indirectly by exploring why patients visited the same physician. Factors identified by participants in their focus group study, all of whom had been with their physicians for longer than 15 years, identified the passage of critical life events and the relationship that developed over time. This first aspect is supported by two quantitative studies.[39;45] Using two-way analysis of variance, Mainous and colleagues[45] found a significant interaction between duration of relationship and experiences shared between patient and physician, defined as "been through a lot together": for all lengths of relationship with the physician, the value that patients placed on continuity increased when patients indicated shared experiences. Schers[39] reported that patients' value for continuity increased when a serious life event had been experienced in the previous five years.[39]

The study by Brown and coworkers[46] was conducted in Ontario, Canada, but the importance of the on-going relationship is echoed in related qualitative studies conducted in the USA,[47-49] Sweden[50] and the UK.[51;52] In brief, a continuing patient-doctor relationship has been linked with more trust in the physician and with better communication. Patients in these studies drew comfort from seeing the same doctor and did not feel they had to justify their attendance; felt problems could be discussed more openly and efficiently; and thought that it was easier to be both understood by and to understand the doctor. There may be therapeutic benefits, both directly from adherence to medication, but more significantly from the interaction itself. Again, these qualitative results are supported by quantitative investigations. Nutting *et al*[44] observed that patients who valued continuity and saw their own physician rated them more highly on accumulated knowledge, coordination of care and interpersonal communication. In the study by Freeman and Richards, patients who desired continuity of care said they were significantly more likely than those who did not to be willing to discuss a personal problem with their usual doctor (odds ratio 4.1, 95% confidence interval (CI) 1.6 to 10.5).[41]

2.2.1.3 What are the possible harms?

Seeing the same doctor may have many potential benefits to patients, but this linked to patient-doctor continuity occuring out of choice. If patients were always forced to see the same doctor, the findings may be different.

Above all other considerations, patients want doctors who listen and solve problems.[53] The key factors associated with patient satisfaction are providing information, medical skills, and interpersonal skills, none of which are directly dependent on continuity.[54] It is debatable whether patients can judge technical aspects of care, but the freedom to change doctors may be an important safeguard for patients.[24] Even assuming that the doctor being seen is competent, reducing choice for patients too much may decrease the chance of them finding a doctor with whom they feel at ease.[33] That is, imposed continuity may interfere with the establishment of a good patient-doctor relationship, characterised by components such as trust.[55;56]

Some patients may choose to purposefully avoid, rather than especially see, particular doctors because of unsatisfactory consultations with them in the past.[41;52] Reasons for patients choosing to see another doctor include wanting a second opinion, wanting to discuss an embarrassing problem with a doctor they do not know, or believing they are taken too casually by their own GP.[38] Federman *et al*[57] examined physician behaviour and process of care factors that affected patients' intention to return to their usual health care practice in the Boston area of New England. Of the 2,782 patients interviewed, 160 (5.8%) indicated they would not be willing to return. After adjusting for demographics, health status, health care utilization, satisfaction with physician's technical skill, site of care, and clustering of patients by provider, two variables were significantly correlated with unwillingness to return: dissatisfaction with the visit duration and patient report that the physician did not listen to what they had to say.

Continuity and choice of doctor are therefore clearly related, and both are associated with patient satisfaction. Weyrauch[58] reported in 1996 on a computer-assisted telephone interview survey, performed at an urban health maintenance organization (HMO). He found that both choosing one's physician and seeing one's own physician for the evaluated visit correlated significantly with satisfaction with care.

2.2.1.4 Which patients get continuity?

Having established, in principle, the value that patients attach to continuity, this section goes on to explore how this is reflected in practice. Do the patients who value continuity achieve it? And what are the factors that explain any differences observed?

The question of which patients receive continuity has been investigated by means of medical note review and patient questionnaires. Freeman and Richards[59] in 1990 undertook a retrospective study of 776 patient records in four large group practices (three open, one personal, list systems) in the Southampton area to "establish the degree of continuity of care in general practice". To be eligible, patients had to have been registered for at least two years and consulted at least 12 times over six years or less. Increasing patient age and the recording of a major problem were found to be associated with continuity. There was no significant association between either received or desired continuity of care and sex, marital status, social class, school leaving age or reported serious health problem. An association between continuity and increasing patient age was found, and confirmed in a later study by the same authors.[41] In 1995, using the general practice records of 110 patients with "poor" continuity, Sweeney and Gray[60] undertook a case-control type study to examine the issue from the other side of the question – what patient factors were associated with discontinuity? Discontinuity, or "absence of longitudinality", was defined as "four consecutive consultations that did not take place with the doctor with whom the patients were registered". Compared with an age and sex matched control group who did receive continuity of care, patients who did not receive continuity were from lower social classes, were more likely to not attend, to be depressed and to have relationship problems, including with the doctor. However, this study is dated now (data were collected 1988-1990) and its generalisability is limited because all patients were registered with one doctor in a single group practice in south west England.

In the previously discussed postal questionnaire study, Kearley *et al*[33] found the following patient factors were associated with having a personal GP: increasing length of registration, consultation frequency, age, and accessibility of the chosen GP. Patients who valued continuity were also more likely to have a personal GP. In contrast, there was no independent association with sex or socioeconomic status, nor was it associated with whether or not the patient valued convenience. Guthrie[61] used the large cross-sectional data set collected by Howie *et al*[62] in a secondary multilevel analysis to investigate the factors associated with patients seeing their usual doctor. In the original study data were collected from 25 994 people aged 16 years or older who consulted during a two week period at 53 general practices in four regions of the UK. Overall 61.6% of patients saw their usual doctor, but this varied from 39% to 98% between practices. He reported that increasing age was associated with seeing their usual doctor, but that there was an interaction with sex: whilst younger men were less likely than younger women to see their usual doctor, this phenomenon reversed in older age groups. Compared with patients who only wished to discuss a new or urgent physical problem, those wishing to discuss psychological or longstanding physical problems were more likely to be seeing their usual doctor. However, in a cross-sectional survey of 2400 patients visiting 17 general practices in The Netherlands, Schers *et al*[63] found that patients saw a familiar GP to a high extent, regardless of the reason for encounter, perceived seriousness of symptoms and worries.

2.2.2 Providers' perspective

As discussed in the previous chapter, some of the threats to continuity stem from changes embraced by GPs. In parallel to the patient perspective (2.2.1), this section asks: what is known about the value that GPs attach to continuity, what are the possible benefits and harms, and to what to what extent is continuity is provided?

2.2.2.1 Do general practitioners value continuity?

In 1985 Freeman[64] used a postal questionnaire to assess the attitude of general practitioners in the Wessex region of England to continuity of care. Two-thirds of his sample was asked to rank six priorities of practice organization, one of which concerned continuity of care. Highest priority was given to "Minimal delay for patients' appointments" and "Patients should see the same doctor if possible". Interestingly, doctors in large practices gave more priority to the importance of seeing the same doctor than smaller practices, perhaps because continuity is more of an issue for them. Hjortdahl[3] reported in 1990 on the responses of a "representative sample" of 207 Norwegian family physicians who were mailed questionnaires: eighty percent said continuity was important or very important concept to the ideology of family practice.

Larger, more recent international surveys of physicians suggest GPs still value continuity. In 2004 Schers *et al*[65] reported on the views of 595 trainee's and 478 trainers in The Netherlands. Using a postal questionnaire, they found that although trainees attached more importance to continuity, both highly valued continuity for serious problems. Stokes and coworkers[66] conducted an survey of general practitioners/family physicians in England and Wales (568 respondents), the United States (453), and the Netherlands (502). The doctors in all three countries felt strongly that personal continuity remained an important aspect of good-quality care to their patients. In England and Wales positive attitudes to personal continuity were associated with being female and working a personal list. However, physicians' personal and practice characteristics explained only a small part of the overall variance in personal continuity scores. They concluded that GPs appear to value personal continuity of care, irrespective of health care setting or demographic characteristics.

Doctors' attitudes to continuity are likely to be reflected in where they choose to work. Limited evidence for this can be found in a paper published in 1986 by Roland *et al.*[42] As part of their investigation of continuity in four group practices in Bristol, they asked the GPs to score the importance that they attached to continuity of care in five clinical situations (long-term management of diabetes, acute tonsillitis, depression following bereavement, oral contraception and antenatal care). Doctors from personal list practices were found to rate the importance of continuity more highly than doctors from the combined list practices. Unfortunately this finding was based on a sample of only eight doctors recruited from four practices (two with personal and two with combined list systems).

2.2.2.2 What are the possible benefits?

For doctors who value continuity, what does it offer them and when? As the study by Schers *et al*[65] has already alluded, personal continuity is said to be valued by doctors most when dealing with illness that is chronic, serious, complex or psychological in nature. Ridd *et al*[23] conducted in-depth interviews with 24 GPs in the South West of England, purposefully sampling doctors with characteristics that might elicit a range of opinion on continuity. The majority said they valued personal continuity in their everyday work, especially with patients who had serious, complex or psychological problems. Similarly, the Scottish GPs in the study by Guthrie and Wyke[52] said that personal continuity was particularly important when patients had chronic disease, or multiple complex or psychological/emotional problems. In von Bultzingslowen and coworker's qualitative study,[50] continuity was held to be "a prerequisite for chronically ill patients to experience security". Doctors in this study thought this was because patients with chronic diseases want a doctor they can trust and who takes on responsibility. Doctors were concerned that single encounters with chronically ill patients engendered anxiety and insecurity.

From the perspective of the GP, patient-doctor continuity leads to a number of benefits. The GPs in Ridd and colleagues' investigation[23] believed that personal continuity enabled them to provide higher quality care. Mutual benefits to doctor and patients were said to be better communication, problem recognition, and more opportunity for pro-active and consistent care. It may be easier for patients to tell the "real truth" to a personal doctor than to short-term doctors.[50] According to Freeman *et al*[32] personal continuity fosters "a multidimensional diagnosis, based on the biopsychosocial model within the patient's context". This assertion was supported by the doctors in Guthrie and Wyke's[52] study who said personal continuity allows "more effective and efficient diagnosis and management of problems presented" because they were considered "in the context of the whole person, including the patient's family and social circumstances, and their past response to illness." Weyrauch *et al*[67] undertook a qualitative study of the role of US family physicians' personal knowledge of the patient in clinical practice. Through primarily semi-structured, "long interviews", they identified that personal knowledge was thought to help: foster a sense of predictability in personal interactions; facilitate the creation of trust; organise data collection, recall and interpretation; counterbalance impersonal professional principles; communication; and referral decisions. Continuity may mean GPs are able to "tailor" management decisions to the individual patient who may derive therapeutic gains from the relationship itself.[23]

The studies by Ridd *et al*[23] and Guthrie and Wyke[52] also demonstrate other ways in which continuity is claimed to benefit doctors and hence patients. Longitudinal care of patients may help in the management of uncertainty inherent in many primary care consultations.[68] Freeman writes that some ill-defined problems can be left to evolve and often to resolve.[32] There may be an educational benefit to doctors from continuity: seeing the same patients provides feedback on the efficacy of their diagnosis and treatment.[68] Fairhurst and May[69] asked 15 GPs to audio-record 25-30 consultations with consecutive consenting patients and got them score each consultation according to how satisfying they found it. Consultations in which doctors perceived a "connection" between themselves and the patient were by and large among the most satisfying.

Of course, what GPs say about the benefits of continuity is one thing, but whether in practice it really is so central to their working lives is another. Qualitative studies can try to disentangle whether the values attached to continuity are grounded in reality or just reflect professional rhetoric,[23] but they are complemented by alternative methodologies such as that adopted by Schers and colleagues.[70] In a study based in The Netherlands, Schers *et al* recruited 30 GPs from 17 practices and collected data from each GP on 200 successive consultations, using a questionnaire which contained items on the perceived importance of personal continuity. Using multilevel analysis, only seriousness of problem, consultation type and nature of main reason for encounter contributed significantly to the model. That is, it appeared GPs valued continuity mainly for serious and psychosocial conditions. However, they went on to compare GPs' individual consultation scores with the importance that they reported in a questionnaire completed prior to the start of the project and they found no correlation. One possible explanation for the apparent contradiction in intra-GPs' attitudes, as suggested by the authors, might be that the pre-study questionnaire captured attitudes towards a concept, whereas the consultation results reflected patient and consultation-related attitudes.

2.2.2.3 What are the possible harms?

Although personal continuity may make certain types of patient or problem less stressful and lead to greater work satisfaction, potential downsides to continuity have also been identified. [3;13;23;52;71;72] First, continuity discourages doctors who work in a group practice from sharing the workload. Consequently patients may have difficulty obtaining GP appointments and face increased waiting times.[73]

Second, over-familiarity may lessen the doctor's objectivity, adversely affecting decisions on investigations and/or leading to late or missed diagnoses. Weyrauch *et al*[67] reported that although personal knowledge may have many benefits, it may also interfere with diagnosis or with patient presentation of new information. Doctors in long-term relationships may be more reluctant to challenge patients about behaviours that are negative for their health.

Third, the doctor-patient relationship may act as a barrier to the delivery of evidence-based medicine[74;75] and secondary prevention[76] in primary care. In a study of Dutch GPs, Veldhuis[74] reported that doctors departed from evidence based practice most commonly because of the doctor-patient relationship: the wish to be nice was used, on average, in 42% of deviations, and the wish to prevent a conflict in 30%. Using a Balint-style model, Freeman and Sweeney[75] set-up three focus groups of 19 GPs to explore the reasons why GPs do not always implement best evidence. Six main themes emerged, two of which concerned the patient-doctor relationship and the

GPs' feelings about their patients: implementation was influenced by the relationships that doctors developed with their patients. To quote one participant: "Even if the evidence was extremely good most of us would only ever interpret it in the context of the patient." Some doctors found that personal relationships tended to make practising evidence based medicine "harder because you have a close relationship with them." The assumptions doctors made about their patients seemed at times paternalistic. One doctor built up the relationship with the patient by initially not following the guidelines and then, in a position of greater trust, was able to implement the guidelines properly. Summerskill and Pope[76] used semi-structured interviews and focus groups to explore GP attitudes to identify factors influencing the implementation of CHD secondary prevention measures. Although lack of time was said to be the greatest barrier, GPs reported difficulty balancing implementation of evidence with the demands of the doctor-patient relationship. The desire to preserve a good relationship and to maintain compliance with other treatment regimens was sometimes more important than implementing secondary prevention.

Fourth, doctor-dependence may be fostered with loss of patient autonomy. Balint[77] noted the stress associated with long-term relationships with patients with complex difficulties. O'Dowd[78] famously coined the term "heartsink" where patients who consult repeatedly with insoluble problems come to be seen as the issue rather than their complaints. Chew-Graham and colleagues[79] interviewed 101 GPs in a series of studies on the management of patients with chronic symptoms in primary care. GPs felt that their relationship with apparently chronically incapacitated patients became as intractable as their symptoms. They blamed their training for forcing them to concentrate on maintaining the doctor-patient relationship and thereby making them collude with patients and their symptoms. They recognized that the ongoing relationship may be beneficial for that patient, but caused frustration for them.

Finally, the sense of responsibility that longitudinal care can engender in doctor may lead to stress and professional burn-out.[3]

2.2.2.4 Which practices and doctors provide continuity?

Again, having established the value that doctors attach to continuity in principle, this section goes on to examine their provision of it in practice. Despite the high ideals associated with continuity, family doctors find the provision of it difficult.[3] Information on factors associated with the provision of continuity is at the practice level – no research at the level of the doctor was identified. The main practices factors appear to be list system, size and accessibility.

Roland *et al*[42] reviewed the notes of 128 patients (eight men and eight women per doctor, two doctors per practice, four practices) who had to have been continuously registered with the same practice for more than two years and to have consulted the doctor on more than three occasions during that time. Patients' continuity scores were calculated by dividing the number of consultations with the doctor seen most frequently during the two-year period by the total number of consultations during that time. Patients in the personal list practices had higher mean continuity scores (0.82) than those in the combined list practices (0.52). In the aforementioned 1990 study by Freeman and Richards,[59] patients registered at a practice operating a personal list were also observed to have seen the same doctor more than in the three practices with combined lists. Children also saw a smaller number of doctors: only 15% of children in the personal list practice saw five or more different doctors compared with 87.5% of children registered with practices operating combined lists. In another study by Freeman and Richards,[41] which compared patients in combined and personal list practices, combined list patients found it easier to see another doctor and harder to see a usual doctor. Receptionists who work in shared list practices that operate bookable appointment systems might be expected to influence who the patient sees. However, an investigation by Freeman[73] in 1989 suggested that their influence is small in relation to other factors which are ultimately decided by the doctors themselves. Patients may be unaware of practice policies that encourage them to see the same doctor.[41]

These associations between practice list system and continuity have been confirmed by Guthrie[61] (odds ratio of patient seeing their usual doctor in personal list compared with open list 3.27, 95% CI 1.87- 5.70). He additionally showed an association with practice size (largest compared with smallest quintiles of list size, odds ratio 0.19, 95% CI 0.10-0.37). Based on the same data set Howie and colleagues[62] had previously reported that the proportion of patients who knew the doctor well decreased as total list increased.

Access to primary care and its relationship with continuity have been explored in a number of studies. Forrest and Starfield[80] analysed data from the 1987 National Medical Expenditure Survey and found that longer appointment waits, no insurance, and no after-hours care were associated with lower levels of continuity. More recently, Haggerty *et al*[81] conducted a survey of primary health care clinics in Quebec, Canada. Using the Primary Care Assessment Tool, they sought to identify attributes of clinic organization and physician practice that predicted accessibility and continuity. In short, evening appointments increased relational continuity, whereas walk-in care and high-volume practice style were associated with lower relational continuity. Finally, a study by Mäntyselkä and coworkers[82] in Finland deserves mention. They used data from a population-based questionnaire study to examine views on the accessibility and continuity of primary medical care. They reported that people living in municipalities with a personal doctor system perceived access to care as being better than did those without access to a personal doctor system. However, because the data are cross-sectional, this finding could also be interpreted as meaning that access begets continuity, not the other way around. In an evaluation of an initiative introduced in the UK in 2004 to try and improve patient access to general practice, Salisbury *et al*[83] found no difference between advanced and non-advanced access practices in continuity of care. Perhaps this is unsurprising when there was little differences between these groups in terms of the access targets.

2.2.3 The continuity-access conundrum

In general, what happens with continuity in practice generally follows what one would expect from the earlier presented principles of continuity. However, clearly the importance that patients or doctors attach to continuity is only one factor that determines whether the patient sees the same doctor or not.

The biggest single "competing" issue is that of access. Access, another core value of primary care, has been defined as the fit between the patient and the healthcare system.[84] Like continuity, access is a major topic with an extensive literature that is beyond the scope of this thesis, but the interface between continuity and access does warrant brief discussion.

The relationship between continuity and access is complex but they are inextricably linked, and in a resource-limited healthcare system a balance often has to be struck between them.[85] Achieving the optimum balance between continuity and access is a challenge[81] and research suggests patients may have unrealistic expectations about what is achievable. In a secondary analysis of data from UK general practice research studies that examined patients' views on access and continuity in general practice, Bower *et al*[86] reported that a satisfactory standard of access was next day appointments and a satisfactory level of continuity was seeing the same general practitioner "a lot of the time". Of course, in reality trade-offs have to be made, and the priority given by patients and doctors to continuity or access depends on the context.[43]

In Guthrie and Wyke's[52] qualitative investigation they noted that discussion of personal continuity and access was "intertwined in the patient interviews ... most patients balanced 'when to be seen' against 'who to see', depending on the problem to be discussed." Decisions about who to see were largely driven by the value placed on personal continuity or an ongoing relationship with a particular GP. For most patients, what mattered was "access to appropriate care", where what was appropriate depended on the problem to be dealt with. For chronic, complex and psychological problems this was usually consultation with a GP with whom the patient had an ongoing relationship. For minor or episodic problems, or where the problem was perceived as very urgent, then any GP was felt to be appropriate. Kearley *et al*[83] compared the value that patients and GPs attached to having a personal doctor. Both groups appeared to agree that having a personal GP may be valued more than a convenient appointment for important problems: terminal care and family, psychological or multiple problems. For minor problems, convenience was rated above a personal doctor by patients and GPs. However, compared with patients, GPs were less inclined to use the extreme categories of "not at all important" or "extremely important", and attached less importance to the patient seeing a personal GP for a lump in breast/testicle "significant pathology" scenario. One could hypothesise that this difference in opinion arises because at first presentation of this particular type of symptom the patient's priorities are emotionally-centred where the clinician's are more biomedically focused.

2. Continuity of patient care

Alternative methods employed by researchers to explore the importance that patients attach to different attributes of primary care are "willingness to wait/pay" studies and discrete choice experiments (also known as conjoint analysis). Two US studies have been published using the former method. In a telephone survey of 658 adults, Love and Mainous[87] found that when asked about seeing an alternate physician for an acute, non-threatening medical condition, 42% would wait one day or more to see their usual doctor, and 10% would not see anyone else. Meanwhile, Pereira and Pearson[34] found that over half of those surveyed in their study would be willing to pay a nominal monthly fee for their physician, and those with chronic conditions were more likely to say they would pay extra money for continuity.

Three relevant studies that have used discrete choice methodology, all UK-based, are by Gerard *et al*,[88] Turner *et al*[89] and Rubin *et al*[90]. Gerard *et al*[88] determined the relative importance of factors that influence patient choice in the booking of general practice appointments for acute/low worry and on-going/high worry conditions. In order of importance, factors influencing the average respondent's choice of appointment were: seeing a doctor of choice, booking at a convenient time of day, seeing any available doctor and having an appointment sooner rather than later. These findings were the same for both types of condition, but in addition for the on-going, high worry condition the duration of the appointment was also of (small) value. Patients traded off speed of access for more convenient appointment times and were willing to trade off speed of access for continuity of care. Turner *et al*[89] asked patients to consider two vignettes describing different reasons for consulting, in the context of their current health status. They found that individuals' values changed according to their reason for making a primary care consultation. For "minor familiar symptoms", respondents would be prepared to trade off very little in the way of extra wait for increased continuity, whereas patients were prepared to accept longer waits for increased continuity in the "new uncertain symptoms" (2.4 days for relational continuity and 3.9 days for informational continuity) and "routine-check up" (4.2 days for relational continuity and 7.8 days for informational continuity) vignettes. Rubin *et al*[90] estimated the relative importance to patients of three attributes (time to appointment, choice of time, choice of doctor) in making a routine appointment to see a GP. Patients attending as an emergency expressed a preference to see any GP, and waiting time to make an appointment was important if the appointment was for a child or for new health problems. Otherwise, other responders traded-off a shorter waiting time and were willing to wait in order to either see their own choice of doctor or attend an appointment at their own choice of time. Older patients, females and those with long-standing physical illness preferred to see their own choice of GP for a hypothetical routine appointment and they were willing to wait longer to do so (an extra 2.5 days, 2 days and 1 day respectively).

Thus the message from of these studies may be encapsulated by what Freeman *et al*[91] referred to as an "inverted U":

> *"Extremes of quick access to an impersonal professional and equally of being locked in to a single provider seem unacceptable, but the best balance will vary with the patient's personal and medical context."*

2.2.4 Summary

The presented studies suggest that in principle continuity is valued by the majority of patients and doctors. Both sides feel that a personal patient-doctor relationship may be therapeutic in itself, possibly consequent of more "holistic" care. Better patient-doctor communication, knowledge and trust may all make for a more honest and efficient consultation. GPs' personal knowledge of his or her patients may be important in "the process of making medical, ethical, and pragmatic patient care decisions."[92] In addition continuity may benefit doctors in ways that are not apparent to patients, such as improved clinical decision making and educational feedback.

Nonetheless, the benefits attributed to patient-doctor continuity, such as care that is therapeutic and consistent, are not guaranteed. Seeing the same GP may be therapeutic to patients only if their encounters with that doctor are satisfactory. Rather than envisaging continuity as a series of patient consultations with one doctor to the exclusion of all others, it is probably more important that a patient has choice and a good interpersonal and therapeutic relationship with one or more practitioners.[32] Consistent care is neither the preserve of continuity nor necessarily always a positive characteristic. One doctor can contradict himself in successive consultations yet two or more doctors may work well to an agreed plan;[71] and in a worst case scenario the care provided by one doctor may be of an unwelcome consistency – consistently poor.

In practice the priority given by patients and doctors as to who sees who and when varies according to the nature of the problem. Both sides agree that continuity is particularly valued for more serious, psychological and family issues. Hjortdahl[85] observed:

> *"Different groups of patients have different views of the importance of continuity. It may be that individual patients hold different views on continuity, both over time as they go through different stages of life, or even at the same time for different health care reasons."*

Patients appear to value continuity most when both a preference and a need for continuity occur together. The preference may be based on an experience of continuity or even discontinuity.

2.3 What is the evidence that continuity matters?

Most of the research on the value of continuity presented so far has been positive yet largely circumstantial because the majority of studies have relied on the face value statements of patients and providers. Have their claims stood-up to closer investigation? Writing in 1980, Gonella and Herman[93] asserted that continuity of care:

> *"is of value only to the extent that it has an impact on outcomes of care, the prevention or reduction of physical, mental, or social disabilities, the satisfaction of patients, and the costs of care."*

In fact, the American Academy of Family Physicians defines continuity in these means-to-an-ends terms:

> *"[Continuity of care is] ... the process by which the patient and the physician are cooperatively involved in ongoing health care management toward the goal of high quality, cost-effective medical care".*[94]

This section therefore briefly summarises research that has examined continuity and its association with outcomes. Outcomes can be divided into measures of patient satisfaction, markers of quality of care (such as glycosylated haemoglobin scores in people with diabetes mellitus) and econometric. The majority of evaluations incorporated in the reviews cited below have been conducted in primary care, but work from mental health and maternity care also feature.

2.3.1 Continuity and satisfaction

In a review of interpersonal continuity and patient satisfaction published in 2004, Saultz and Albedaiwi[95] identified 22 reports of original research describing the results of 20 studies. Of the 22 articles, 19 reported higher patient satisfaction with more continuity. Four of these studies were randomised controlled trials: Alpert *et al*[96;97] and Becker *et al*[29;98] studied paediatric care; Wasson *et al*[99] examined men older than 55 years at a Veterans Administration clinic; and Rowley *et al*[100] investigated antenatal care by midwives. All four found aspects of improved patient satisfaction in study groups with higher continuity of care. However, all these trials were flawed by study methods that failed to isolate continuity as the only uncontrolled difference between the study groups. In two of the four trials, continuity of care was not measured in either the intervention or control group.[29;98;100] In the trials by Alpert *et al*[96;97] and Wasson *et al*[99] interpersonal continuity was measured by the percentage of patients who could name their physicians. Wasson *et al*[99] also reported the usual provider continuity index (UPC) and the sequential continuity index (SECON) to show higher continuity scores in the intervention group.

Cabana and Jee[101] also published a systematic review in 2004, which included a section looking at continuity and satisfaction. (They also reported on continuity and process of care and outcomes, and cost of care, and these are included in the relevant sections below.) They defined satisfaction as "an individual's (e.g. patient, caregiver, or provider) emotional or cognitive evaluation of the structure, process, or outcome of health care." However, their review differs from others in two important respects. First, they focused on sustained continuity of care, which they defined as "continuity of care between a patient and a health care provider through a relationship over time". Second, they applied strict inclusion criteria, and as a consequence from the 5087 candidate titles in their original search, only 18 were included: 12 cross-sectional studies, five cohort studies and one RCT. Based on the results of four studies, they found a consistent association between sustained continuity and patient satisfaction, Research linking continuity with provider satisfaction is in comparison sparse. Blankfield *et al*[102] found that residents and faculty doctors' satisfaction scores were highly correlated with the continuity of care provided.

2.3.2 Continuity and care outcomes

Three reviews have attempted to summarise research on continuity of care and care outcomes.[13;103;104] As previously mentioned, the review of sustained continuity by Cabana and Jee[101] also reported on care outcomes.

The most substantial of the reviews was by published in 2005 by Saultz and Lochner.[103] Defining a care outcome as "a measurable result of care that would generally be considered a desirable outcome or quality of care from a patient's point of view and that, ideally, would relate directly to reduced patient mortality or morbidity", they identified 41 research articles reporting the results of 40 studies examining its association with 81 different care outcomes. The most common outcomes examined in these studies were the delivery of preventive care (12 studies examined 22 separate outcome variables), hospitalization rate (9 studies, 11 outcome variables), quality of doctor-patient relationship (5 studies, 5 outcome variables), chronic illness management indicators (4 studies, 8 outcome variables) and maternity care outcomes (4 studies, 16 outcome variables).

Of the 40 studies, 35 found a positive association for at least one outcome. In two studies, continuity was associated with a worsening of at least one outcome: Roos *et al*[105] found that appropriate referral criteria for tonsillectomy were less likely to be documented when interpersonal continuity was present; and Gallagher *et al*[106] found that women were more likely to receive counselling about hormone replacement therapy when they received care from both a family physician or internist and an obstetrician.

However, most of the studies included were retrospective cohort (11) or cross-sectional (17) in design, which do not provide evidence of a cause-effect relationship. Also, six of the seven clinical trials did not report a measure of continuity in either study group. In the only clinical trial that did show better continuity in the intervention group, Wasson *et al*[99] found significantly fewer hospitalizations, fewer intensive care unit days, and shorter hospital lengths of stay in elderly male veterans. Despite the methodological problems, Saultz and Lochner[103] conclude that continuity seems to be associated with improved preventive care and reduced hospitalization, but that the association between continuity and improved measures of chronic illness care less certain.

Published in 2003, the review by Gray and colleagues[13] was narrative and restricted to primary care. They looked at 88 references and concluded that evidence of the benefit of continuity was strongest in the areas of preventive care and adherence. In respect of chronic disease, they felt the evidence was less clear-cut – especially in diabetes. For instance, in Finland Hanninen *et al*[107] studied 260 patients with diabetes and found that continuity of care was associated with better health-related quality of life (as measured by the well-being dimension of SF20) but poorer HbA1c control. In Australia, Overland and colleagues[108] found that in a secondary care sample of patients, those attending one GP had significantly more diabetic complications than those attending several GPs and their HbA1c concentrations were also higher, though not significantly. Broom[109] interviewed Australian adults with type 2 diabetes. Half of all participants had a diagnosis that could be categorized as resulting from discontinuous primary care: hospital admission, change of doctor, patient initiative and/or diabetic emergency. She concludes that the same circumstances that enhance the management of chronic disease can at times hinder its diagnosis. In contrast, Cabana and Jee[101] concluded that an association between sustained continuity and quality of care "appears most consistent for patients with chronic conditions". Seven studies showed decreased hospitalizations and emergency department visits and five studies showed improved receipt of preventive services.

The most recent of the reviews (2006) by van Servellen *et al*[104] examined the clinical trial literature. They sought to determine the extent to which informational, management, and relational continuity of care (see Table 2-1) were associated with quality care indicators. Analyses of 32 unduplicated citations revealed management continuity interventions were identified most often, followed by informational and relational continuity interventions. They lament the "meager" amount of clinical trial literature and note that few studies have shown that increasing continuity improves quality of care.

2.3.3 Continuity and health care cost

In their review, Saultz and Lochner[103] also identified 21 articles reporting the results of 20 studies of the relationship between continuity and cost. These studies examined a total of 41 resource use variables, the most commonly studied being hospitalization rate (ten studies), frequency of office visits (four studies), emergency department visits (four studies) office appointment no-show rate (four studies), and utilization of diagnostic tests (four studies). A significant positive association was found between reduced cost and interpersonal continuity for 35 of these variables. For two variables cost outcomes were higher (Hjortdahl and Borchgrevink[110] found that increased interpersonal continuity was associated with increased prescription drug use and specialty referral), and no significant association was found for the remaining four. Unfortunately, all but one of the studies examined only indirect aspects of cost, and only one actually correlated total health care cost with continuity of care. The highest quality studies found an association between continuity and lower cost variables, but limitations of study methods again mean no inference can be made about cause-effect relationships.

Two studies in the review by Cabana and Jee[101] found sustained continuity of care was associated with increased costs, whilst a third was associated with decreased costs.

2.3.4 Summary

In 2003 Christakis[111] argued that on the "the preponderance of evidence" continuity of care should be declared an desirable outcome in its own right and future research should be focused on how to better achieve it. However, the preceding review of the evidence suggests that this call may be premature. Given the supposed integral value of continuity to primary care and the decades of research that have been dedicated to its investigation, the knowledge base is disappointing. The strongest and most consistent evidence is for an association between continuity and patient satisfaction. Otherwise the picture is decidedly mixed. Problems stem from the three main issues of study design, populations/problems investigated and conceptualisation difficulties.

There are a lack of experimental studies where a specific approach to enhancing continuity and assessing the outcome has been subject to rigorous trial in order to make a reasonable deduction of causality. Ideally, the value of continuity would be resolved by randomized trials, but long-term studies of this kind are difficult.[13]

It has already been highlighted that continuity probably does not matter to everyone all the time. Consequently, as proposed by Christakis,[112] should researchers not ask "Does continuity of care make a difference at a population level?" but rather, "Are there specific subpopulations for which continuity of care is especially valuable?" Studies targeted to the types of patient and problem identified in the literature may be more likely to show where personal continuity really matters and or is even harmful.[12]

Despite its high profile continuity remains an ill-defined concept[113] which means different things to different people.[114] As Hjortdahl observed, continuity is "often lauded but seldom defined".[85] Researchers have failed to agree on the most fundamental question of what continuity is and how to measure it. The absence of an agreed continuity vocabulary makes it difficult to compare findings from one study with another,[113] and conclusions about the benefits/disbenefits of continuity cannot be made until one is sure the concept of interest has been measured.

2.4 How has continuity of patient care been conceptualised?

The final section of this chapter takes a step back from the core subject of interest, patient-GP continuity, and considers continuity in broader terms. What work has been done to try and address the methodological challenge of defining and measuring continuity?

2.4.1 How has continuity of care been defined?

The task of drawing together the literature is complicated by two issues. First, other terms such as continuum of care, coordination of care, case management, integration of services and seamless care are often used synonymously.[4] Second, some aspects of continuity overlap with concepts such as personal care.

Continuity has received multiple definitions both by authoritative figures in the field of primary care and by researchers trying to investigate its value. (For a comprehensive list of definitions used in studies, refer to Appendix G "Summary of definitions of continuity of care" that accompanies the review by Reid *et al.*[115]) Although primary care is not a strong component of healthcare in USA, McWhinney and Starfield are key figures who have advocated continuity in primary care. In 1975 McWhinney wrote that continuity "is not delineated by the nature of the disease" and is a "continuity of personal responsibility", "terminated only by death, by mutual agreement, or by decision of one of the parties." Starfield[55;116] distinguishes between continuity and longitudinality. She sees continuity as a problem orientated mechanism of information transfer, which helps achieve coordination of care. In contrast, longitudinality is person orientated and concerns the presence and use of a regular source of care over time, which requires a personal relationship. Once again, the centrality and uniqueness of continuity to primary care are asserted:

> *"Longitudinality is an essential element of good primary care. The building and maintaining of a long-term patient practitioner relationship, regardless of whether there is a problem or what the problem might be, is at the heart of primary care ... Although specialist care often requires the building of a personal relationship, it is, by definition, oriented towards specific problems rather than towards total care of the patient over time."*[116]

In Europe, Gray and Freeman from the UK and Hjortdahl have been probably the most influential figures in the field of continuity research in primary care to date. In 1979 Gray[40] distinguished between "continuous" and "personal" care. Continuous care refers to seeing the same physician over time. Personal care refers to a trusting and committed relationship. Freeman and Hjortdahl[68] more recently observed that:

> *"... in the context of general practice it [continuity] is still virtually synonymous with care from one doctor, usually spanning an extended time and more than one episode of illness."*

2.4.1.1 Studies of providers' and patients' perspectives of continuity

A number of studies based in primary care have tried to establish the meaning of continuity from the perspectives of providers and patients.

In 1985 Freeman[64] asked GPs in Wessex, UK to define continuity by means of a postal questionnaire. Respondents offered a wide variety of definitions but the majority (61%) specified care by one doctor, either for an episode of illness or for a longer period, and 16% specified care by a team. Other definitions included care of the whole patient, communication with hospitals or within the practice, care of the whole family by one doctor, the concept of consistency and the need for commitment from doctor and patient.

On the pretext that traditional "cradle to the grave" continuity "is no longer sustainable in modern society", Sturmberg and coworkers[117] recruited 28 Australian GPs to take part in focus group discussions to explore their understanding and practice of continuity of care. Participants felt that continuity of care provided the basis for good "holistic" clinical practice and that an on-going doctor–patient relationship was a "structural prerequisite to achieve continuity of care". This relationship required a stable care environment and good doctor–patient interaction, with the goal of achieving an improvement in the patient's overall health. Provision of care by one doctor did not necessarily equate to continuity of care.

More recently, Alazri and colleagues[118] sought to explore UK GPs' and nurses' experiences of continuity of care for patients with diabetes mellitus. He conducted semi-structured interviews with 16 GPs and 18 practice nurses, who managed patients with diabetes type two, and identified three types of continuity: relational, team and cross-boundary. Relational continuity was continuity provided for the patient by a named health care professional, which might range from a few years to the whole lifetime of the patient and was not restricted to patients with chronic disease such as diabetes. However, many practice nurses and GPs did not limit their definitions of continuity to the involvement of a single health care professional. Team continuity described the patient continuity with a group of health care professionals working in the same practice. Finally, cross-boundary continuity was continuity provided between primary and secondary care settings.

In a qualitative study, Pandhi and colleagues[48] examined "how patients perceive a continuity relationship, from its development through its consequences." The majority of patients were not familiar with the phrase continuity of care, but all patients in the study identified comfort with their doctor as important in establishing and maintaining an ongoing relationship with the physician that they named as their own.

2.4.1.2 Continuity and personal care

The concept of continuity of care is commonly confused with that of personal care and the personal doctor. Continuity of care may lead to increased personalisation of care in some circumstances, but continuity of care can and does exist outside highly personalised care.[24] Hjortdahl[85] writes:

> *"continuity of care may lead to better knowledge and sense of responsibility and trust, all of which can be summed up in that rather poetic phrase 'personal doctoring'."*

He further argued that although there is a close relationship between continuity and personal doctoring, continuity should be seen as a tool and personal care as a process.

The terms personal care and personal doctor are used interchangeably. Both are poorly defined. Baker[20] views personal care as being the care of individual patients tailored to the requirements of that person. Fox[30] described the personal doctor thus:

> *"His [sic] essential characteristic is that he is looking after people as people and not as problems ... His function is to meet what is really the primary medical need. A person in difficulties wants in the first place the help of another person on whom he can rely as a friend – someone with knowledge of what is feasible but also with good judgement on what is desirable in the particular circumstances, and an understanding of what the circumstances are."*

Key characteristics of the personal doctor according to Fox are therefore that he gives continuous care, is accessible in time of need and is approachable.

Research defining personal care is scanty. Through a mixture of interviews and postal questionnaires, Cartwright[119] undertook a study of patients' experiences of general practice across the UK in the 1960s. She described a personal doctor in terms of the following "arbitrary" characteristics: the doctor would know a patient by name if they met in the street; the patients' relationship with the doctor was friendly rather than business-like; the patients might discuss a problem that was not strictly medical with the doctor; and the doctor explains things fully to patients.

More recently, a key study by Tarrant and colleagues[51] has thrown some light onto this area. They conducted semi-structured interviews and focus groups with patients, GPs, nurses and practice administrative staff to explore the meaning of personal care in UK general practice. Most respondents valued relationships in primary care and had clear ideas about when care in the context of a relationship was most valuable. The key features of personal care identified were human communication, individualised or tailored care, and whole person care. Human communication comprised good interpersonal skills, evidence of empathy and the perception that providers listened and "had time" for the patient. Individualised or tailored care meant diagnoses, treatment and management plans were adapted to each person. Finally, whole person care involved dealing with the person in the context of their life (including family) and illness, rather than just the presenting problem. Personal care was described in the context of a continuing relationship (central to many accounts of personal care), a single consultation, and from the practice as a whole. GPs tended to focus on the importance of a continued relationship in developing personal knowledge whereas patients tended to focus on the experience of receiving personal care, and human communication was central to this. Greater importance was attached to a continuing relationship when the patients' problem was significant (long term, complex or emotional), if it fitted in with the patients' social context and lifestyle, and if patients had experienced continuity of provider. The authors concluded that personal care is promoted by, but not always dependent on, a continuing provider-patient relationship, and that human communication and individualised care are important in making care personal whatever the context.

To try and understand the core values of having a personal doctor in a continuing relationship in primary care among long-term "chronically ill" patients, von Bultzingslowen *et al*[50] conducted "open individual interviews" with 14 patients from three Swedish primary health care centres (16 health care providers were also interviewed "for triangulation"). Using a content analysis technique, they identified a core category security, based on feelings of coherence, confidence in care, a trusting relationship and accessibility. Coherence was dependent on the doctor knowing about the patient's disease history; noticing changes in health status; and having a holistic approach. Confidence arose from the perception that the doctor takes on responsibility and coordinates care, and is skilled. Trust in the relationship was said to be built on: feeling confirmed and respected as a human being; experiencing understanding and empathy; being believed and taken seriously; and feeling that care allows for cooperation, patient participation and empowerment. The final category of accessibility was based on what the patients thought regarding: knowledge about the doctor and his/her way of working; and feeling that the doctor can be reached.

Lings *et al*[49] ran five patient and two provider focus groups to describe, conceptualize and explain "patients' and doctors' experiences and behaviour with regard to the therapeutic relationship." Participants were randomly sampled from Family Medicine Centre in Rochester, USA. They describe three key factors in patient-doctor relationships: "asymmetrical" communication; the importance on both sides of "liking"; and the value set by both parties on development of trust. Continuity of relationships may promote the development of trust and liking, and make patients more tolerant of a doctor's mistakes.

2.4.1.3 Multi-faceted continuity

The above studies highlight the multi-faceted nature of continuity. Three reviews of the continuity literature area have been published which have proposed similar ways of classifying its different dimensions.[4;91;113]

In 2001 Freeman et al[91] reported on a scoping exercise of continuity research which crossed all medical disciplines. They identified six different elements: continuity of information (good information transfer following the patient); longitudinal continuity (care from as few professionals as possible); relational or personal continuity (the establishment and maintenance of a therapeutic relationship); cross-boundary or team continuity (effective communication between professionals and services and with patients); experienced continuity (the experience of a coordinated and smooth progression of care from the patient's point of view); and flexible continuity (flexibility to the needs of the individual over time).

The review by Saultz[113] was restricted to articles indexed by the Medline database. He also described six dimensions of continuity. The first four are similar to the Freeman review: informational continuity (providers share comprehensive records), chronological or longitudinal continuity (on-going health care with the same professionals), interpersonal continuity ("a special type of longitudinal continuity in which an on-going relationship between patient and care provider is characterized by personal trust and responsibility") and interdisciplinary or team-based continuity (knowledge of the patient is shared across medical services). However, he also introduced geographical continuity (care is provided with continuity regardless of the location of the patient) and family continuity (all family members receive care from providers who have ongoing knowledge of the health problems of other family members). Saultz went on to suggest that informational, longitudinal continuity and interpersonal continuity are related in a hierarchical fashion. In this model, interpersonal continuity is established through longitudinal continuity, which occurs on the foundation of informational continuity.

Perhaps the most comprehensive and helpful paper comes from Haggerty *et al.*[4] It is comprehensive because it is a summary of the findings of an extensive multidisciplinary systematic review of continuity[115] and it is helpful on three counts. First, Haggerty and colleagues highlight how other health care disciplines view continuity differently: specialities emphasise coordination of care whereas in the primary care literature, continuity "is mainly viewed as the relationship between a single practitioner and a patient that extends beyond specific episodes of illness or disease." A sense of affiliation between patients and their practitioners is therefore implied, although there is a trade-off between accessibility of healthcare providers and continuity. Second, in addition to describing three different types of continuity (informational, management and relational – see Table 2-1 for definitions), two core concepts are identified: care of an individual patient and care delivered over time, which "distinguish continuity from other healthcare attributes and sets explicit guidelines for measurement."[4] Third, they acknowledge that the importance attached to each type depends on the context, and each can be viewed from either a person-focused or disease-focused perspective.

Table 2-1 Different types of continuity identified by Haggerty *et al*[4]

Type of continuity	Description
Informational	The use of information on past events and personal circumstances to make current care appropriate for each individual
Management	A consistent and coherent approach to the management of a health condition that is responsive to a patient's changing needs
Relational	An ongoing therapeutic relationship between a patient and one or more providers

2.4.2 How has continuity of care been measured?

In order to try and quantify the effect of continuity of patient care a plethora of continuity indices have been developed. Their number and type are confusing and consequent of the failure to agree how continuity should be defined, no single approach is wholly inclusive of all facets of continuity. Broadly speaking, continuity has been measured from the perspective of the patient, the doctor or the health care system.[120] This reflects the discussion so far on how the value of continuity may vary between these three viewpoints according to the circumstances. Indices vary in the information they provide about patients' pattern of attendance and relationship with health care providers.

Two recent reviews of the various continuity indices have tried to bring some clarity to the area.[113;121] Saultz[113] identified 21 different instruments which he divided into measures that do not require an assigned provider, measures that require an assigned provider, and measures of family continuity. Jee and Cabana[121] proposed a theoretically more advanced means of understanding the "unique assets and limitations" of the 32 indices they identified. They described five different types of continuity measures: duration of provider relationship, density of visit, dispersion of provider, sequence of provider, and subjective estimate. Duration measures are self-explanatory and provide a temporal assessment. Density measures calculate the frequency with which care is sought with respect to a particular provider whereas dispersion measures incorporate how many different physicians a patient has seen. Sequence measures examine the order in which a patient sees a provider. Subjective measures are patient-rated perceptions of continuity such as satisfaction.

Neither of these categorisations fully capture all of the detail and nuances of the alternative continuity measures. For example, Eriksson and Mattsson[122] have distinguished between individual and visit-based measures. With the exception of the family continuity measures,[123;124] all of the indices have in common that they relate to one patient but no one system of classification can summarise all of their differences succinctly. An alternative way of classifying the different continuity indices is to divide them into measures of longitudinal and personal continuity. Each type in turn can be based on observed or subjective data. That is, measures of longitudinal continuity can be calculated on the basis of consultation patterns according to the medical record or patient self-report, and measures of personal continuity can be made by observing patient-doctor interactions or by asking patients to rate them.

2.4.2.1 Longitudinal continuity measures

Longitudinal continuity is the relatively easier concept to measure quantitatively and for this reason it has tended to be used as a proxy for personal continuity. Measures of patient longitudinal care can be divided into provider-unspecified and provider-specified types.

Unspecified provider measures express continuity in terms of the number of providers seen. Specified provider measures can be expressed in terms of how long patient and provider have known one another or in terms of their encounters. Encounters between patient and provider can be just counted, but more commonly they have been expressed in relation to patients' other contacts with the health care providers. So, Number of Providers, which is self-explanatory, is an example of an unspecified provider index; and Usual Provider of Care (UPC), which expresses number of consultations with the "usual" provider as a proportion of the total number of consultations, is an example of a provider-specific index. The simplest types of longitudinal care measure are binary. Examples are yes/no answers to the questions "Does the patient have a regular source of care/doctor?" and "Did the patient see the same doctor in two consecutive visits?" Some indices are based on complex mathematically formulas that take, for instance, the interval between encounters into account and "weight" the score accordingly.

Methodological problems can arise with provider-specific indices if there is not a clear main provider of care. Some investigators have attempted to overcome this problem by arbitrarily using either the first provider seen or the most frequently seen provider.[113] An alternative is to calculate the index in relation to the provider seen on a given visit, the so-called visit-based measures.[122]

Whilst empirical studies have shown at an organisational level that these different measures tend to give similar results, their different mathematical properties can be important in some situations. Salisbury *et al*[120] note that "In particular, continuity scores using some measures will tend to be inversely related to consultation rate, while other measures make adjustment for utilisation level." The literature does not provide guidance on which healthcare professionals (doctors, nurses, etc) or types of consultation should be included when calculating these measures.

The issues of the appropriateness of the type of continuity index according to the research question and the data upon which these are calculated will be returned to in the methods section (7.4.1).

2.4.2.2 Personal continuity measures

Personal continuity is the more important dimension of continuity, and the more difficult concept to measure. This is reflected in the few indices of this type that have been identified by the reviews.

Measures pertaining to the personal dimension of continuity are discussed in more detail in the next chapter (3.2.2). Briefly, they can be broadly divided into global measures of patient-doctor relationships and those that ask about specific aspects of the relationship such as knowledge and trust. Some studies have relied on patients' reports of having a "personal doctor" whilst others have asked patients whether they have a regular source of care, from which personal continuity could possibly be inferred on the grounds of loyalty. Also, the personal continuity may be reflected in measures not developed specifically as continuity indices, such as those pertaining to patient-doctor communication and patient satisfaction.

2.4.3 Summary

Definitions of continuity vary between disciplines and it can be viewed from the perspective of the patient, the provider or the organisation. It has process and outcome dimensions. Processes of continuity include such things as the sharing of information about the patient between providers and the patient being able to see the same doctor or nurse. Outcomes of continuity are described in terms of providing care that is consistent, coherent and focused on the whole person. There is a paucity of work that tackles how distinct the different aspects of continuity are or how they are related.

Researchers attempting to operationalise and measure continuity face a minefield of conceptual and practical problems.[120] Each type of continuity index provides a different perspective on the patient-physician relationship.[121] Measures of longitudinal care have been most commonly used, but they only act as a proxy for the more important dimension, personal continuity.[112]

Given the lack of consensus about what continuity means and uncertainty about how important the different elements are, it is important that in this study the author is clear about what aspects of continuity are being examined and to consider possible relationships between them. The facets of continuity being examined should be defined and underlying hypotheses about how and why continuity is of interest stated.[120]

2.5 Patient-doctor continuity

The focus of this thesis is continuity of patient and doctor (general practitioner) from the patient's perspective. From the presented summary of the literature, three key elements can be identified and so defined. The first is longitudinal continuity, which refers to the patient seeing the same doctor over time, and put simply is a product of both access to and preference for seeing a nominated physician. The second is personal continuity, also called interpersonal or relational continuity, which concerns the interaction between patient and doctor and the development of a relationship over a series of encounters. The third is informational continuity, which describes information about the patient held and exchanged via their medical records.

2. Continuity of patient care

The next chapter builds on this distillation of these core dimensions and discusses why patient-doctor continuity may be important for doctor identification of patient psychological distress.

3. Patient-doctor continuity and GP detection of patient psychological distress

3.1 Introduction

In the previous chapter three key aspects of patient-doctor continuity were identified: longitudinal, personal and informational continuity. This chapter begins by exploring in more depth the relationship between them and how unique they are. It then goes on to describe a model that encompasses the dimensions of longitudinal and personal continuity, redefining them in terms of the more mutually exclusive elements of longitudinal care, consultations and depth of relationship.

The preceding chapter emphasised that the value of continuity may be context sensitive. That is, seeing the same doctor may not be necessary for all people all of the time, but it may matter to many people sometimes, and for some people with particular problems it could be important nearly all of the time. One situation identified where continuity may be highly relevant was mental health problems, a subject that represents a significant part of the GP's workload. After briefly reviewing the prevalence and nature of psychiatric problems in primary care, the discussion will focus on factors associated with the doctor detection of patient psychological distress, most notably communication skills and continuity.

This chapter will conclude by proposing a study based on the longitudinal care-consultations-depth of relationship model that will generate new insights into the value of continuity. Specifically, is patient-doctor longitudinal care associated with a depth of relationship? And are either of these dimensions of continuity associated with better GP detection of patient psychological distress?

3.2 Patient-doctor continuity

3.2.1 Longitudinal, personal and informational continuity

Reviews of continuity over the years have sought to describe the different facets of continuity, and as has been already discussed, there is a significant amount of overlap between the most recent classification systems (see 2.4.1.3). Whatever taxonomy is used, the different sub-types of continuity are related and yet vary in their distinctiveness. These issues are considered below in respect of longitudinal, personal and informational continuity, and reasons for needing a model that comprises more individual elements are put forward.

3.2.1.1 Relations and overlap between different types of continuity

One of the central arguments encountered in the literature on continuity of patient care is that longitudinal continuity leads to personal continuity. Longitudinal continuity can refer to how long the patient has been registered with the GP, but a more useful way of thinking about it may be the total amount of time the patient and doctor have had with one another over a series of encounters.[13] Each consultation in an extended series of consultations, which transcends multiple illness episodes, represents an opportunity for patient and doctor to get to know one another better. Saultz[113] has argued that in the ideal case this leads to personal continuity, which is "characterized by trust, loyalty, and a sense of responsibility." However, the relationship is not necessarily disrupted by interruptions in continuity.[55] Personal continuity does not demand that contacts between patient and doctor are exclusive,[32] so that patients can develop relationships with two or more doctors at the same time.[13]

Moreover, whilst longitudinal continuity may promote the development of a personal relationship between doctor and patient, it does not guarantee it.[68] Continuity of care may be necessary but not sufficient for clinicians and patients to get to know each other well. Kearley *et al*[63] showed that practice systems designed to promote longitudinal continuity were not associated with superior personal care and Guthrie and Wyke[52] have observed that the inferences that GPs make about the relationship from longitudinal consultation patterns may be wrong. The degree to which care is personal is influenced by the quality of patient-doctor interaction, since a succession of consultations characterized by poor communication may generate less personal care than a few consultations with good communication.[20] This was exemplified by one patient in the study by von Bültzingslowen *et al*[50] whose regular GP's failure to communicate understanding and empathy meant he reported more confidence and trust in a short-term locum doctor. Freeman and colleagues[125] did not find that seeing the regular doctor or personal list systems were associated with patient enablement, whereas knowing the doctor well was. Similarly Hjortdahl and Laerum[126] found that satisfaction was higher among patients seeing "my" doctor rather than "the same" doctor. Mainous and Salisbury[56] therefore reasonably argue that longitudinal continuity is therefore not an end-point in itself, but rather a strategy to enhance the patient-physician relationship.

According to Roter,[72] relationship-building occurs in consultations when the physician facilitates patient participation and/or attempts to equalize status. The primary means of doing this is probably by employing communication skills, although other factors such as the personal characteristics of the patient and the doctor may influence this process. Salmon & Young[127] observe that the central aim of patient-doctor communication in consultations to build a relationship is "… widely written, and read, as uncontroversial and, indeed, axiomatic." However, they encourage researchers to question this metaphor and test it. Zoppie and Epstein[128] make the astute comment that communication "should be viewed as a means to, and a marker of, being in relation."

Certainly patients report personal care on the basis of a single consultation,[51] yet an isolated interaction between a patient and a doctor is different from a relationship. Stewart[129] and Candib[130] criticise research on the patient-doctor relationship for focusing only on communication skills to the neglect of the more enduring dimensions of the relationship. Candib writes:

> *"An interaction is characterized by an observable exchange of behaviours, whereas a relationship is characterized by more subjective qualities, such as caring, concern, respect, and compassion."*[130]

A qualitative study of the needs of patients with breast cancer by Burkitt Wright *et al*[131] supported the distinction between communication skills and other aspects of patient-doctor relationships, but it attracted considerable criticism after being published.[132-135] Patients may value having a relationship with a doctor more than specific behaviours or skills, which appear to be interpreted differently in the context of a relationship anyway.[131;136]

Patients' medical records provide informational continuity by acting as an aide memoir to the GP and by acting as a means by which information can be shared between different professionals involved in the care of the patient. Patients value the role that medical records play in acting as memory prompts to their usual doctor and providing some transferable knowledge if their physician is not available.[47] Relying on memory alone may not be a good strategy[137] although doctors are likely to recall important issues about patients.[138]

However, medical records as a means of providing on-going care have their limitations. First, there is no consistency in how much information is recorded in a patient's record.[71] GPs often have thoughts about patients' management in subsequent consultations, but these are rarely documented.[139] Doctors may be reluctant to record some things, but their attitudes may differ.[32] In addition, concerns about confidentiality mean patients may have reservations about certain types of personal information being put in their medical records.[140;141] Therefore some information may be privy to a specific patient-doctor relationship. Second, the focus of medical records is commonly medical knowledge, which is different from the knowledge associated with personal continuity.[4;14;113] Saultz[113] writes:

> *"A common methodologic problem in continuity research is confusion about the difference between knowledge of the patient and a relationship with the patient. One can know about a patient by reading a medical history, but knowing a patient's medical history does not imply any relationship with that patient."*

Hjortdahl distinguishes between two types of personal knowledge. The first is a mutual understanding: the patient knows what to expect of the doctor and the doctor has personal knowledge about the patient's previous history of illness. The second concerns the GPs' "integrated knowledge", much of which is tacit and gathered from several sources and over time. Freeman *et al*[52] stress that a doctor's prior knowledge of a patient is not just about information, even psychological and sociological material, but it is also about regard for the relationship in general. They argue that these aspects exist in the perceptions of patient and doctor and in the degree to which these are shared and recognised. Personal knowledge about the patient, such as their preferences, values, and context, is usually accumulated in the memory of the doctor and may be important for bridging separate care events.[4;67;142] There is no quick and accurate means of recording psychological or social aspects of consultations in patient notes.[32]

Third, informational continuity by itself it does not guarantee that management is consistent or coherent and Guthrie *et al*[14] argue that in complex situations there remains a clear role for individual clinical judgment applied within an on-going relationship. Thus it is hard to see how informational continuity can directly substitute for personal continuity.

3.2.1.2 The need for a model to distinguish between unique elements of continuity

It can therefore be seen that there is a considerable amount of ambiguity within and overlap between these different types of continuity. The labels longitudinal and personal continuity are ambiguous for the following reasons. Longitudinal continuity is the simplest, yet it can be expressed as either the duration of the relationship, as the number of encounters between the patient and the doctor, or as the proportion of the total number of encounters that were with an assigned doctor. Personal continuity combines aspects of both patient-doctor interaction and the on-going relationship. Informational continuity and personal knowledge will comprise facts of a biomedical and psychosocial nature, but the informational continuity will be biased towards biomedical and personal knowledge will be stronger on the "softer" aspects of patients' lives. Exploration of the value and relationships between the different elements would be facilitated by introducing an alternative nomenclature, where the terms are more clearly defined and mutually exclusive. It is important to be clear about which elements contribute what to patient care, in order to be able to inform how health care is organised and delivered.

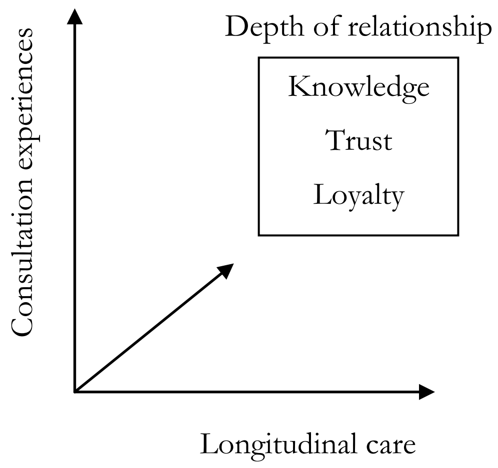
The key components that appear to underlie the concept of patient-doctor continuity are the number of encounters between doctor and patient, the quality of those interactions, and the on-going relationship. For the sake of clarity, these different aspects might be better referred to simply as longitudinal care, communication skills, and depth of patient-doctor relationship. Informational continuity, or the medical record, is an important background factor for researchers to consider when investigating the effects of patient-doctor continuity on patient care. However, in general practice where GPs share a clinical record, it represents a backdrop against which all patient-doctor encounters occur, whereas the other components are unique to each patient-doctor dyad. Focusing on the three elements of patient-doctor longitudinal care, communication skills and depth of relationship permits exploration of two issues central to continuity research. First, how the patient seeing the same doctor, the interaction between the patient and the doctor, or a combination of the two, develops the relationship. Second, whether depth of relationship, as opposed to longitudinal care, leads to better patient care.

Salisbury *et al*[120] have made a similar argument and proposed a comparable model. In this version, longitudinal continuity (repeated consultations over time with as few doctors as possible) leads to a patient-provider relationship (a caring relationship between health professional and patient). Informational continuity is incorporated into a broader coordinated care concept, which concerns the care provided between professionals and provider organisations.

3.2.2 Longitudinal care, consultations and depth of relationship

In an earlier piece of work Ridd and colleagues[143] sought to derive a conceptual framework of the factors that define patient-doctor relationships from the perspective of patients. They did this by undertaking a systematic review and thematic synthesis of 11 qualitative studies of on-going patient-doctor relationships. They sought to map-out the key components of patient-doctor relationships to see what they comprised and how they might inter-relate.

Figure 3-1 Conceptual framework of patient-doctor relationship



Although the literature broadly supported a framework that described on-going patient-doctor relationships in terms of longitudinal continuity, communication skills and depth of relationship, a refined model was proposed. The new framework distinguished between patient-doctor longitudinal care, consultation experiences and depth of relationship. Longitudinal care specifically concerns seeing the same doctor. Consultation experiences comprise major and minor components. Major components are patient-doctor communication and time. Minor components include the outcome of patients' problems, the opinions of friends or family and practice-level factors. Depth of relationship is further defined in terms of knowledge, trust, loyalty and regard. Ridd *et al*[143] proposed that seeing the same doctor (longitudinal care) and patients' encounters with the doctor (consultation experiences) are the main processes by which patient-doctor depth of relationships is promoted (see Figure 3-1).

Based on the findings of Ridd *et al*,[143] the rest of this section is explores in more detail patient-doctor consultations and depth of relationship. Supplemented by other relevant literature, it discusses their definition, how they have been measured, and any previous research that has examined their relationship with longitudinal care and patient outcomes.

3.2.2.1 The patient-doctor consultation

There is a large body of literature about the patient-doctor consultation. This section on patient-doctor consultations begins by briefly acknowledging the purpose of the consultation and major theoretical issues. It then focuses on the two major structural elements of communication and consultation length. The minor influences on consultation experiences are more subtle and clearly harder to account for, so remembering that this is an exploratory study they are not considered in any more detail.

3.2.2.1.1 Background

The purpose of the consultation is both diagnostic and therapeutic. Engel describes two fundamental patient needs to be met by the doctor in the consultation: to know and understand (a cognitive desire for information and explanation about the problem) and to feel known and understood (an affective desire to feel accepted, legitimised, respected and care about by the doctor).[144] Freeling and Harris[145] observe that in general practice:

> *"Consultations … consist of an exchange of information and assumptions between doctor and patient from which the patient should gain insight into what is the matter with him. This exchange may occupy more than one interview and is never really completed …"*

More commonly referred to in the North American literature as the "medical interview", Cohen-Cole[9] identifies three primary functions of the consultation: gathering information, enhancing a healing relationship, and making and implementing decisions. Both of these quotes view the consultation as a serial event, with an on-going relational element.

There are a range of frameworks for analyzing and describing the consultation. As Bower and colleagues[31] observe, despite advances in understanding the consultation, the knowledge gained is not supported by any overarching theory. A patient-centred model of consulting is widely advocated, but there is little consensus as to what this means.[146] From analyses of audiotaped consultations, Byrne and Long[147] originally described a continuum of general practitioner consulting styles ranging from "doctor-centred" to "patient-centred". In doctor-centred consultations the doctor's behaviours serve the doctor's control needs whereas patient-centred consultations reflect the patients' needs and preferences.

Studies of consultations between clinician and patient have focused on patient-doctor communication during single encounters. Some researchers have tried to make a distinction between communication skills (defined primarily as what doctors say) and interpersonal skills (how, when and to whom they say it).[148] The latter element tends to carry the emotional content of the discourse. However, most of the literature treats these terms synonymously and for the purposes of this thesis they will be used interchangeably.

3.2.2.1.2 Patient-doctor communication

Many studies of patient-doctor communication have employed one of the numerous instruments that have been developed to try and objectively assess the interaction.[149] A 1988 meta-analysis of communication studies found that the 250 or so different elements of communication measured in the reviewed studies could be reduced to five broad and subsuming categories: information giving, information seeking, partnership-building, rapport-building, and socioemotional talk.[150]

In her comprehensive review of the literature, Stewart[151] found strong evidence linking physician-patient communication to a variety of patient health outcomes, including emotional health, symptom resolution, functional status, physiologic measures (for example blood pressure and blood sugar level), and pain control. Non-verbal communication may be the most important part of the emotional interaction with patients.[9] Research has shown that communication about affective matters tends to be less verbal and deliberate than task-oriented communication.[148] It has been estimated that less than a tenth of emotional communication is conveyed verbally, the majority being transferred by body language and voice tone.[152] Beck *et al*[153] reviewed the primary care literature from 1975 to 2000 to determine which physician verbal and non-verbal behaviours have been linked with favourable patient outcomes. Verbal behaviours positively associated with health outcomes included: empathy, reassurance and support, patient-centred questioning, encounter length, history taking, explanations, both dominant and passive physician styles, positive reinforcement, humour, psychosocial talk, time in health education and information sharing, friendliness, courtesy, orienting the patient during examination, and summarization and clarification. Non-verbal behaviours positively associated with outcomes included: head nodding, forward lean, direct body orientation, uncrossed legs and arms, arm symmetry, and less mutual gaze.

Doctor's communication skills can be improved by interventions designed to improve clinicians' patient-centredness.[154;155] However, Harrington *et al*[155] note that most studies failed to describe the range of health professionals providing care, whether patients attended for more than one consultation, or patients' previous experience with the service. The extent to which familiarity and pre-established interaction patterns influenced patients' contribution to the consultation is therefore uncertain.

How dominant are different communication skills in consultations and how does their use vary? In a study of routine consultations at 11 ambulatory clinics and private practices in USA, using the Roter Interaction Analysis System Roter and colleagues[156] identified five distinct communication patterns (narrowly biomedical, expanded biomedical, biopsychosocial, psychosocial and consumerist) and reported that most out-patient physicians employed a predominant communication style.

No single demographic or clinical predictor unequivocally predicts what style of communication a given patient will prefer. Older patients, patients with physical complaints, and patients diagnosed with cancer are three groups who may prefer a more paternalistic style of consultation.[157-159] For example, Savage and Armstrong[157] found that patients with simple physical complaints were significantly more satisfied with a "directing" as opposed to "sharing" consulting style from their GP, but this difference disappeared where patients' main complaints were of a chronic physical or psychosocial nature. Swenson *et al*[160] derived a "ground-up" framework of patient communication preferences based on semi-structured interviews with 230 adult medicine patients. They found that respondents understood and had distinct preferences regarding different types of physician communication. Different communication preferences were often associated with different patient values or expectations about the physician-patient relationship.

Some studies suggest that the communication style of a patient's own physician, particularly a physician that the patient likes, is a strong predictor of what type of communication she/he prefers. As part of the same study, Swenson and colleagues[161] asked 250 patients to watch a videotape of two versions of a simulated patient-physician scenario: the style of the first was biomedical and the second patient-centred. Participants were more likely to prefer the videotaped doctor whose style was the same as their own physician's. McKinstry[162] showed 410 patients in Lothian, Scotland, one of ten video "couplets" comprising an introduction followed by two different versions, shared and directed, of five different presenting conditions. Immediately after viewing the interviewer asked patients which version (shared or directed) they thought was best and which was most like their own doctor's style. Generally, patients described their own doctor as having the same style as their preferred style.

These findings lead onto other work that has started to explore the relationship between patient-doctor continuity and communication. Studies in primary care by Bertakis and colleagues[163;164] appear to confirm the observation made in 1976 by Byrne and Long[147] that the interaction changes over a series of visits. In an earlier study, Bertakis *et al*[163] simply compared new and established patient-physician encounters. They found that in established as opposed new patient encounters, consultations were shorter, less structured and involved more "chatting", counselling, discussion about treatment compliance and effects. In a later more advanced study, they video-taped up to three consultations of 212 new adult patients who saw the same doctor as their initial appointment during the one year study period.[164] Again, compared with initial patient visits, return visits were shorter and featured less "technically orientated" (history taking, physical examination, and treatment planning) behaviour. However, research by Jabaaij *et al*[165] failed to identify any evidence for a continuity-communication effect. Using data from the second Dutch National Survey of General Practice, they analysed 394 videotaped consultations and found no relationship was found between GP-patient familiarity and the discussion of medical issues, psychological themes, or the social environment of the patient.

Studies by Love *et al*[166] and Rodriguez *et al*[167] suggest that communication is positively influenced by continuity. Love *et al*[166] assessed the role and importance of continuity of care in predicting perceptions of the physician-patient consultation. Respondents to a state-wide survey of adult Kentucky Medicaid recipients were asked to rate continuity of care, provider communication, and patient influence over treatment. Continuity was found to contribute significantly to provider communication and patient influence, especially for patients with asthma, where it was the only variable that significantly contributed to the provider communication model and the only variable other than life satisfaction that contributed to the patient influence. Rodriguez and colleagues[167] analysed data from 14 835 patient from the practices of 145 physicians (internal medicine, family practice, or general medicine) in Massachusetts to explore whether visit continuity affected patients' experiences with primary care. Using multilevel regression models, they found that physician-patient communication was more strongly influenced by visit continuity among patients in earlier stages of the primary care physician-patient relationship. Flocke has also correlated continuity with communication[168] and linked discontinuity of physician to poorer patient-physician communication.[169]

However, another observational study by Flocke *et al*[170] of 2881 patients visiting 138 family physicians for outpatient care in 84 community family practice offices in northeast Ohio, suggested a possible negative consequence of continuity on the quality of the consultation. They reported that patients of physicians whose styles rated poorer on communication equally preferred to see a usual physician as those with physicians with more highly rated communication styles.

3.2.2.1.3 Consultation length

The duration of the consultation is a major influence on doctor-patient encounters. Patient and doctors prefer longer consultations. Patients do not like feeling hurried and they appreciate doctors who "have time" for them,[47-51;171] and many patients would like longer consultations with their doctor.[54] Qualitative studies suggest that patients with complex chronic conditions require longer consultations to allow adequate time for review of their illness, treatment discuss its impact on their lives.[172] Yet patients with depression, for example, who are conscious of time constraints, may present an edited version of their symptoms and concerns, talking about only the most pressing issues.[173]

Research has associated more time in consultations with better quality care. Doctors with longer consultation times prescribe less and offer more advice on lifestyle and other health promoting activities.[174;175] Wider patient care agendas are more likely to be covered in consultations with extra time.[176] Longer consultations are also associated with greater recognition of relevant comorbidity.[176] Howie *et al*[175;177] found doctors whose mean consultation are longer as against shorter not only have more longer and fewer shorter consultations than other doctors, but also have patients who felt more "enabled".

The benefits of longer consultations have lead to calls for booking intervals to be increased.[174] However, Mechanic[178] among others have disagreed, citing the high levels of patient dissatisfaction in the USA even though the consultation length is twice that in the UK. Instead, he has argued for "meaningful time", improving the process rather than the length of the consultation. Certainly patients with depression in Pollock and Grime's study,[173] how the time was used, rather than the absolute length of the consultation, was what mattered. Work by Cape *et al*[179] and Ogden *et al*[180] provides further insight into patient's perception of time in consultation. They investigated different aspects of actual, perceived, and preferred consultation lengths from the patient's perspective. Cape and colleagues[179] collected data on the length of consultations for consecutive patients attending the surgeries of nine GPs and compared them with a patient estimate of duration. Ninety-six (60%) patients overestimated the length of their consultation and 64 (40%) underestimated the consultation length. Consultations where patients were more satisfied appeared to patients to have lasted longer, but were not actually longer. Ogden *et al*[180] used survey data from 294 patients attending eight UK practices. She found that when controlled for both real time and perceived time, a preference for more time was correlated with dissatisfaction with the emotional aspects of the consultation, and a lower intention to comply with the doctors recommendations.

Morrell *et al*,[181] Roland *et al*[182] and Ridsdale *et al*[183] report on interventions that altered the appointment booking interval, hence consultation length, and its effect on patient-doctor communication. The papers by Morrell et al[181] and Roland et al[182] are on the same study conducted in a London group practice of five GP principles. They found in longer consultations doctors spent more time talking and listening to the patients, and asked more psychosocial questions. Ridsdale *et al*[183] study of two GPs in a small practice (2000 patients) located in the outskirts of London demonstrated there were more doctor questions and explanations, and more patient questions and statements in longer consultations. However, in a later publication which combined the data from these two studies, doctors' interview techniques were not found to consistently change with increasing the consultation length.[184] When more time was available, all doctors tended to ask more questions, but other skills, such as facilitation and explanation were used more variably. Instead, GPs who previously used facilitation frequently did it more often in the extra time, whereas doctors who used this technique less frequently tended not to change. Their conclusion was that more time may be a necessary but not sufficient condition to promote the greater use of the skills which some doctors may use less frequently. Alternatively, flexibility in use of time may be the key. Andersson and Mattsson[185] dichotomised 581 patients' consultations with six doctors in three different health centres in Sweden into "good" or not, according to a three-item post-consultation questionnaire answered by doctors and patients. They found no relationship between the proportion of good consultations and the average consultation length, but there was a suggestion that doctors with a higher proportion of good consultations showed a wider variation in consultation length.

Consultation length and continuity may be aspects of care that can be traded off against each other, in that for a given problem, a shorter consultation may achieve similar benefits when the doctor and patient know each other already. This idea is supported by work by Howie and colleagues[186] on an instrument of consultation quality (the consultation quality index or CQI), which comprises consultation length, enablement, and how well the patient knows the doctor. Even though registrars in training are new to the practice and less likely know their patients, they generally scored as well on the CQI as established doctors. This was because they had longer mean consultation lengths and achieved higher enablement scores. In contrast, new partners trying to work at the rate of older doctors achieved lower enablement scores and also lower CQI scores. Much the same also applied to locums. However, Howie and colleagues[62] also found in an earlier study that consultations where the patient knew the doctor well were generally longer than those where it was not the case.

3.2.2.2 Depth of relationship

This section begins by considering depth of relationship as a global concept before focusing on the elements of knowledge, trust, loyalty and regard.

3.2.2.2.1 Global

Patient-doctor depth of relationship comprises patients' enduring views about their relationship with the doctor outside of consultations, which is thought to be the product of interactions with the doctor over a series of encounters.[143] The elements that possibly comprise a depth of relationship are described in more detail below.

Most existing instruments of "patient-doctor relationships" are measures of patient satisfaction or doctors' communication or interpersonal skills. Instruments that ask about on-going relationships generally focus in a single aspect, such as knowledge or trust. As far as the author is aware no questionnaire designed to specifically measures global patient-doctor depth of relationship has been developed and published.

The closest match identified comes in the shape of the nine item Patient-Doctor Relationship Questionnaire (PDRQ-9, see Table 3-1).[187] However, it was designed to measure "how well the patient regards his [primary care physician] as an effective and helpful health professional" and was based on a psychotherapeutic scale, the Helping Alliance Questionnaire (HAQ). In addition, it was piloted in an epilepsy clinic in The Netherlands. Therefore, by virtue of its conceptual basis and the context in which it was developed, the PDRQ-9 may not include aspects of depth of relationship that are unique or important in general practice.

Two further questionnaires that partially examine patient-doctor depth of relationship issues were also identified. The first is the Consultation Satisfaction Questionnaire (CSQ), developed by Baker[188] in general practice. As its name suggests, it was designed as a visit-specific patient satisfaction measure. It is 18 items long and comprises four scales: general satisfaction, professional care, perceived time and depth of relationship. The depth of relationship items (see Table 3-1) are "concerned with the doctor's intimate knowledge of the patient within a relationship and the transmission of very personal information to the doctor." Depth of relationship, as measured by this scale, was shown in a subsequent study (of 7273 patients attending 126 GPs in 39 practices) to be shallower: as the mean age of female patients increased (except in training practices, where the reverse was true); if the practice had a partial personal list system rather than a completely personal list system; in training practices.[189] In another study, Baker[190] reported that trust in physician was more strongly correlated with CSQ depth of relationship among patients seeing their regular doctor than those who did not.

The second questionnaire is the Perception of Continuity (PC) scale, developed by Chao.[191] It was designed to examine patients' attitude to continuity, yet many of its items pertain to aspects of depth of relationship, such as knowledge and trust (see Table 3-1). It was tested by posting it to a random sample of adult patients from a single family practice in Ohio, USA. Participants had to have made their initial visit to the practice at least two years previously, to have visited during the previous two years and to be registered with the primary provider in the computer records. Of the 228 patients mailed, 147 returned the questionnaire. Principal components factor analysis using orthogonal rotation suggested two factors (structural and interpersonal elements) but some items appeared in both factors, suggesting cross-loading, and subsequent analysis mostly treated it as a single scale. Usual Provider Continuity (UPC) and Continuity of Care (COC) indices were calculated based upon chart review of visits to the family practice centre during the previous two years. No correlation was found between UPC or COC and perception of continuity. A higher perception of continuity score correlated significantly with less education and the presence of chronic illness. Patient satisfaction was correlated with the total perception of continuity scale and the structural and interpersonal sub-scales, but not UPC or COC. This study therefore provides some evidence that information provided by continuity indices and by asking patients about their perception of continuity are distinct.

Table 3-1 Existing patient-doctor relationship questionnaires: question items from instruments pertaining to global "depth of relationship"

Questionnaire	Question items
Patient-Doctor Relationship Questionnaire (PDRQ-9)[187]	My primary care physician (PCP) helps me My PCP has enough time for me I trust my PCP My PCP understands me My PCP is dedicated to help me My PCP and I agree on the nature of my medical symptoms I can talk to my PCP I feel content with my PCP's treatment I find my PCP easily accessible
Consultation Satisfaction Questionnaire (CSQ)[188]	*Depth of relationship scale:* There are some things this doctor does not know about me This doctor knows all about me I felt this doctor really knew what I was thinking I felt able to tell this doctor about very personal things I would find it difficult to tell this doctor about some private things
Perception of Continuity (PC) scale[191]	*Structural factor:* Trust a recommended specialist Would provide care if hospitalised Trust my doctor Would provide care if an emergency Want regular doctor in an emergency Get appropriate referrals Have an on-going doctor-patient relationship Care improves with provider continuity Doctor would know me on the street Doctor explains things to me Care for any type of problem *Interpersonal factor:* Easy to bring up unrelated medical problems Doctor would know me on the street Comfortable discussing personal problems Doctor knows about family problems Have an on-going doctor-patient relationship Trust my doctor Comfortable asking questions Care for any type of problem Doctors knows a lot about my family Would provide care if hospitalised Doctor explains things to me See the same doctor each time

3.2.2.2.2 Knowledge

Knowledge was identified by Ridd *et al*[143] as a significant component of patient-doctor depth of relationship. It encompasses patients' knowledge of the doctor, and doctors' perceived knowledge and understanding of the patient.

Many patients like "knowing" the doctor.[47;50;192;193] This may start with a simple familiarity with what they look like, but usually develops into more personal knowledge, for example about the doctor's personality. Of particular importance is the idea that the patient knows or anticipates how the doctor will behave or react.[47;50]

With respect to the doctor's knowledge of the patient, the starting point similarly is basic physical familiarity (putting a name to a face) but also knowledge of the patient's medical history.[46-48;50;193] At a deeper level, the doctor accumulates personal knowledge about the patient, such as their background (including family and social circumstances) and their expectations.[46-48;50;51;193;194]

Measures of knowledge in patient-doctor relationship can be divided into single items and scales. Ettlinger and Freeman,[195] Howie *et al*[62] and Schers *et al*[63] have all used single items ("How well do you know the doctor?") with Likert-type response scales. In these studies knowing the doctor well has been linked with medication compliance[195] and patient enablement,[62] and higher levels of patient familiarity with a GP were associated with higher levels of satisfaction, increased feelings of being helped forward, more trust in the GP, and clearer treatment plans.[63] From the patient perspective, "knowing the doctor" may be a more important correlate with quality than simply seeing the same doctor.[186] Freeman and Richards[196] reported that continuity of doctor (see the usual doctor for more than 50% of the 12 previous consultations) was associated with patients' knowing the doctor "sufficiently".

Scales of patient-doctor knowledge feature in questionnaires by Flocke,[168] Parchman and Burge,[197] and Safran *et al*[198;199] (see Table 3-2). In 1997 Flocke[168] published a 20-item Components of Primary Care Index (CPCI) based on the 1994 Institute of Medicine definition of primary care. It was completed by 2899 patients visiting 138 family physicians' offices in Ohio, USA. One of the four components identified by factor analysis was physician's accumulated knowledge of the patient, which was defined as "the patient's perception that the physician knows his or her values and preferences about medical care issues, clearly understands his or her health needs, and knows the family medical history." It was found to be moderately correlated with interpersonal communication ($r=0.46$, $p<0.001$) but weakly correlated with UPC ($r=0.24$, $p<0.001$). Using the same instrument, Flocke has also linked discontinuity of physician to poorer physician knowledge of the patient.[169] Parchman and Burge[197] used data from the 1993 Medicare Current Beneficiary Survey to test hypotheses about associations between patient-provider length of relationship and attributes of primary care. Their sample was restricted to subjects ages 65 and older (10 232 Medicare beneficiaries). Length of the physician-patient relationship was associated with patient-perceived provider knowledge. Finally, Safran and colleagues have published the Primary Care Assessment Scale (PCAS)[198] and the Ambulatory Care Experiences Survey (ACES)[199] which both feature physician knowledge of patient scales (Table 3-2). Physician knowledge according to PCAS has been associated with adherence and patient self-reported health improvement.[200] Using ACES, Rodriguez *et al*[167] found doctor knowledge of the patient was influenced by visit continuity among respondents in the early stages of a primary care physician-patient relationship.

3.2.2.2.3 Trust

Ridd and colleagues[143] identified patient trust in the doctor as another prominent aspect of patient-doctor depth of relationship. Trust in general has been identified by patients as key to the quality of clinical encounters and patients' experience of health services.[201] The importance of trust to the quality of patient-doctor interactions emerged spontaneously in a number of studies investigating patients' experience of health care.[49;193;202] Trust relationships are characterised by the patient having positive expectations regarding both the competence of the doctor and that they will work in their best interests.[201]

Table 3-2 Existing patient-doctor relationship questionnaires: question items from instruments pertaining to knowledge "depth of relationship" element

Questionnaire: scale	Question items
Components of Primary Care Index (CPCI): physician's accumulated knowledge of the patient[168]	This doctor does not know my medical history very well. This doctor knows a lot about the rest of my family. This doctor clearly understands my health needs. This doctor and I have been through a lot together. How many years have you been a patient of this physician?
Medicare Current Beneficiary Survey (MCBS): accumulated knowledge scale[197]	Your doctor has a good understanding of your medical history Your doctor has a complete understanding of what is wrong with you Your doctor is careful to check everything when examining you Your doctor is competent and well-trained.
Primary Care Assessment Survey (PCAS): contextual knowledge of patient[198]	If I were unconscious or in a coma, my doctor would know what I would want done for me Doctor's knowledge of your entire medical history Doctor's knowledge of your responsibilities at work or home Doctor's knowledge of what worries you most about your health Doctor's knowledge of you as a person (your values and beliefs)
Ambulatory Care Experiences Survey (ACES): knowledge of the patient[199]	How would you rate your personal doctor's knowledge of you as a person, including values and beliefs that are important to you? In the last 6 months how often did you feel you could tell your personal doctor anything, even things you might not tell anyone else? In the last 6 months how often did you feel that your personal doctor had all the information needed to correctly diagnose and treat your health problems?

Unlike knowledge, trust may start at a generic level of "trust in doctors in general" which may be refined (usually deepened) in terms of a personal "trust in my doctor". That is, in the absence of bad experience, patients usually assume that doctors are trustworthy.[50;193] Goold & Klipp[193] set out to explore managed care plan enrolees' expectations and experiences in Michigan. Their paper, however, "focuses on the role of trust in members' perceptions and experiences of managed care", a topic that "participants spontaneously raised during the study". They reported how patients' talk about doctors in general was more abstract than talk about a specific doctor. For some patients, trust in their doctor may remain "blind" but for the majority, trust in a specific doctor was rooted in experience. This observation is supported by the findings of other studies of patient-doctor relationships.[48;50;51;192] Patients used words such as confidence, faith, security and competence. Other work suggests that patients' trust is based at least partly on their views of the doctor's openness and honesty, including the doctor recognising the boundaries of his/her own abilities and their readiness to refer on to others.[46;47] Looking at it from the other side, patients' perceptions of their doctor's trust in them are associated with feelings of being believed.[50] Patients may feel mistrusted if their symptoms are minimised or not taken seriously.

Several reviews of trust in health care have been published, examining how it has been conceptualised and measured, its benefits to patient care and what factors are associated with it.[201;203;204] A number of measures purporting to measure patient trust have been developed, which can be divided into stand-alone instruments (for example, the Trust in Physician Scale[205]) and items included in multi-dimensional questionnaires (for example, the trust sub-scale of the Primary Care Assessment Survey[198]). Patient trust has been associated with satisfaction and loyalty to provider, acceptance of recommended treatment, lower treatment anxiety and adherence to treatment.[201] It is also reported to encourage patients to disclose information, thereby facilitating accurate and timely diagnosis.[201] Lastly, trust may facilitate access to health services.[201] However, there is no evidence so far of a direct beneficial therapeutic effect for trust on health outcomes.

Little is known about the process by which trust develops in the doctor-patient relationship and what aspects of the relationship are associated with increased levels of trust.[203] Trust seems to depend more on clinician than patient factors, although higher trust levels have been reported among older, less educated patients.[201] Qualitative studies suggest that in order to promote patient trust doctors need good interpersonal skills[206-208] and technical competence.[49;131;193] Thom and Campbell[194] conducted a focus group study of patients' self-reported experiences of trust in physicians to gain further understanding of the its components. Nine categories of physician behaviour were described, two of which related primarily to technical competence (thoroughness in evaluation and providing appropriate and effective treatment) and five of which were interpersonal (understanding patient's individual experience, expressing caring, communicating clearly and completely, building partnership/sharing power and honesty/respect for patient). Two additional categories were predisposing factors and structural/staffing factors.

The importance of doctors' interpersonal skills are highlighted by two studies by Tarrant and colleagues.[209;210] The first study was a cross-sectional survey of 1078 patients consulting in ten general practices in the East Midlands. Regression analysis showed that variables relating to the quality of the GP-patient relationship (GP-patient communication, interpersonal care, and knowledge of the patient) were independently associated with trust.[209] The second study was a postal survey of 279 patients in three Leicestershire general practices to test the associations between specific aspects of continuity in the GP-patient relationship and patient trust. This investigation was informed by the theoretical framework of behavioural game theory.[211] Although patients who saw their usual GP had significantly higher trust scores than those who did not, this did not emerge as an independent predictor of trust. Interpersonal care (measured using the three item "interpersonal care" sub-scale of the General Practice Assessment Survey questionnaire, which asks patients to rate the amount of time the GP spent with them, the GP's patience, and caring and concern) was the strongest predictor of trust. Good care from the GP in the past, belief that the GP knew or had checked whether the patient had followed the treatment or advice recommended on past occasions, and the patient's expectation that the GP would provide follow-up care in the future also emerged as significant independent predictors of trust.

The effect of continuity of provider on trust is less certain. Mainous *et al*[212] and Baker *et al*[190] surveyed patients who presented in outpatient primary care settings in the United States (n=418) and in the UK (n=650). Trust was related to the duration of relationship with a usual provider but not with the UPC index.[212] Satisfaction was predicted by trust in the regular doctor and consulting the regular doctor. Among patients with relatively low levels of trust in their regular doctor, levels of satisfaction were similar whether or not they consulted their regular doctor.[190] Parchman and Burge[197] found that length of the physician-patient relationship was associated with patient trust in physician. Trust in turn was predictive of the receipt of clinical preventive services (influenza vaccination, mammography, and ophthalmic check for diabetic subjects). Finally, Schers[63] analysed questionnaire data from 2152 patients consulting 17 general practices (30 GPs) in The Netherlands. He found that patients saw a familiar GP to a high extent and that higher levels of familiarity were associated with more trust in the GP. However, in Tarrant's study[209] length of registration with the practice and the extent to which the patient saw their usual GP were not independently associated with trust.

Therefore, although continuity and trust seem to be linked, the strength of the association probably depends on how you define continuity. They are different aspects of the patient-doctor relationship, whose significance may vary according to the issue being studied. For example, in a study based in South Carolina, Mainous *et al*[213] collected data from 119 newly diagnosed cancer patients (97 breast, 22 colorectal) in face-to-face interviews and used it to examine the relationship between continuity of care, trust in one's physician with stage of cancer. Trust in a regular physician, but not continuity (UPC), was found to be associated with earlier detection of cancer.

3.2.2.2.4 Loyalty

The loyalty aspect of the depth of patient-doctor relationship describes the patient's preference for seeing that particular doctor.[143] Qualitative work by Roberge *et al*[214] suggested that patients' loyalty behaviour is influenced by the commitment of patient and doctor, patient trust in their physician and the quality of the relationship. Patient-doctor communication seems to be a significant contributor.

Loyalty is also reflected in terms of patients' tolerance of unsatisfactory aspects of care.[48;49;192] Lings *et al*[49] call this "seemingly contradictory phenomenon whereby patients express dissatisfaction with certain procedures or events but still maintain a positive relationship" a satisfaction paradox. Examples of such dissatisfaction relate to characteristics of the practice (distant location, problems with the appointment system) and the doctor (running late, poor availability, unsatisfactory consultations, failing to return phone messages).[47;48;192] Patients who have developed a relationship with a doctor "appear able to accept and tolerate less than optimum care if the usual care is good and satisfactory – that is, they seem to 'forgive' the doctor an occasional lapse."[49] In turn, a doctor's actions may be perceived by patients as a marker of their loyalty to them.[46;49;192] Gore and Ogden give an example of how a doctor remained committed to a patient despite their obviously deceitful behaviour.[192]

One loyalty-type specific scale has recently featured in a study by Berry *et al*[215] and the CPCI[168] features a "patients' preference to see their regular physician" scale (see Table 3-3). Berry *et al*[215] analysed cross-sectional survey data from 869 adult patients attending four clinics in Texas. They tested a model that posited that patients' trust in their physician is associated with three physician behaviours (knowledge of the patient, medical competence, and supporting patient autonomy) and patients' commitment to their relationship with their physician is linked to their trust perceptions. They defined relationship commitment as "the degree to which a relationship is valued; with commitment, the patient wants the relationship to continue and invests energy toward its continuance." Most of the items of the questionnaire they used were adopted from existing scales, notably knowledge of patient and trust in physician from PCAS, and relationship commitment from Morgan and Hunt[216] – originally developed for use in commercial relationships. They found that patient levels of adherence and trust were associated with commitment to the physician. In addition they showed that commitment was associated with healthy eating behaviour. As part of the developmental work for CPCI, interpersonal communication was found to be moderately correlated with patients' preference to see their regular physician, and UPC was weakly but significantly correlated with patients' preference to see their regular physician.[168] Flocke[169] has also linked discontinuity of physician to weak patient preferences for seeing their regular physician.

Table 3-3 Existing patient-doctor relationship questionnaires: question items from instruments pertaining to loyalty and regard "depth of relationship" elements

Questionnaire	Question items
Relationship commitment[215]	The relationship that I have with my doctor is ... something I am committed to important to me something I intend to maintain indefinitely something I care about worth the effort to maintain
Components of Primary Care Index (CPCI)[168]	*Patients' preference to see their regular physician scale:* I go to this doctor for almost all of my medical care. If I am sick, I would always contact a doctor in this office first. My medical care improves when I see the same doctor that I have seen before. It is very important to me to see my regular doctor. I rarely see the same doctor when I go for medical care. I want one doctor to coordinate all of the health care I receive.
Patient-physician liking[217]	All in all, I like this doctor a lot I really think this doctor liked me a lot
Physician respect for patient[218]	Did the doctor involve you in decisions about your care? Did the doctor treat you with respect and dignity?

3.2.2.2.5 Regard

The final aspect of depth of patient-doctor relationships, regard, is a primarily affective attribute.[143] It comprises comfort[48;49] and liking,[47;49;192] which reflect perceived care and respect in the relationship.[46;48;50;193;214] As a consequence of the doctor appearing interested and on-side with the patient, the patient feels that they matter to the doctor. Some patients liken a good patient-doctor relationship to a friendship.[47;171] Measures of this aspect of patient-doctor relationships have asked about liking, respect and dignity (see Table 3-3).

Hall *et al*[217] investigated patient-physician liking in a cross-sectional study of 194 patients with type 2 diabetes attending 44 physicians in Kaiser Permanente, North California. Patients were asked to complete a questionnaire that featured two questions about liking ("Patient-Physician Liking", Table 3-3) immediately following a medical visit and again one year later. The mean number of previous visits to the physician they saw during the study was 18 (median 12). Patient liking for the physician was associated with better self-reported health, more favourable ratings of the physician's behaviour, and greater visit satisfaction. Patient liking for the physician positively predicted the patient's satisfaction one year later and was associated with a lower likelihood that the patient considered changing physicians during the year. Patients also reported liking female physicians more than male physicians and there appeared to be reciprocity between patient and physician liking of each other. However, liking was not related to length of relationship.

Beach *et al*[219] have defined respect as "recognition of the unconditional value of patients as persons", which has cognitive and behavioural dimensions. She argues that respect is different to liking, but this theoretical paper is written from the perspective of the doctor, and other literature does not suggest that patients distinguish between these two concepts. Beach and colleagues[220] have used data from the Commonwealth Fund 2001 Health Care Quality Survey (a nationwide random-digit-dial survey of 6722 adults in the USA) to explore whether respect was associated with improved patient outcomes. They were particularly interested in differences between racial/ethnic groups, and the survey was oversampled for African American, Hispanic and Asian residents. However, the two question items used were more behavioural (actions in accordance with respect) than cognitive (belief that respect was present) in nature ("Physician respect for patient", Table 3-3). Nevertheless, respondents who reported being treated with dignity were more likely to report higher levels of satisfaction, adherence to therapy, and receipt of optimal preventive services, but only the association with satisfaction was still significant after adjustment for demographic characteristics. Finally, Blanchard and Lurie[221] used data from the same survey to explore patient reports of disrespect in the health care setting and its impact on care. Minorities were significantly more likely to report being treated with disrespect or being looked down upon in the patient-provider relationship.

3.2.2.3 Summary

Patient-doctor continuity can be understood in longitudinal care, consultation and depth of relationship terms. These three aspects are inter-related, but the underlying theory is that seeing the same doctor and having satisfactory consultations (a combination of good patient-doctor communication and adequate time) with him/her promotes a depth of relationship. This global depth of relationship may comprise knowledge, trust, loyalty and regard dimensions.

Research which has evaluated patient-doctor relationships in consultations has generally ignored the influence of on-going relationships. Indeed, the majority of "patient-doctor relationship" research might be more accurately labelled "patient-doctor encounter" research. Unfortunately our ability to interpret studies that have begun to investigate associations between say longitudinal care and communication are frustrated by their cross-sectional nature. That is, longer relationships may lead to stronger rapport, or good patient-doctor communication early on in the relationship may have promoted the patient's continued attendance to that doctor.

The majority of continuity research to date has focused on longitudinal care when the aforementioned model suggests that continuity of doctor is a process by which patient-doctor interactions can be enhanced and health care improved. Haggerty *et al*[4] write:

> *"Many measures of continuity focus on chronological patterns of care without directly measuring experienced continuity or those aspects of care that translate into connected and coherent care. Unless we understand the mechanisms through which care delivered over time improves outcomes, continuity interventions may be misdirected or inappropriately evaluated."*[4]

The preceding discussion provides one conceptual framework which can be used to explore the relationship between the elements of longitudinal care, consultations and depth of relationship, and to tease out their significance for patient care.

3.3 GP detection of patient psychological distress

The literature suggests that continuity may matter most with on-going conditions of a serious or sensitive nature. Mental health problems fall into this category and represent a significant and important part of general practitioners' workload. Continuity is particularly valued in primary care and mental health care.[4] Therefore mental health in primary care represents an important context in which to investigate the effects of continuity.

3.3.1 Mental health in primary care

General practice is the point of first contact with health services for most people who are psychologically distressed.[222;223] In 1980, Goldberg and Huxley[224] proposed a framework for describing the pathways to mental health care in the UK, a model which still applies today. They described five levels: the community, psychiatric morbidity presenting to general practice, psychiatric disorders identified in general practice, psychiatric out-patients and psychiatric in-patients. The vast majority of psychological problems are managed exclusively within primary care, with less than 10% of such patients referred on to specialist mental health services.[225]

There are therefore many opportunities for GPs to intervene and try and improve patients' mental health. Identification of emotional distress in primary care stands out as a key step on the pathway described by Goldberg and Huxley[224] for accessing mental health treatment. Unfortunately most research has shown that common mental problems often go undetected in primary care.

3.3.1.1 Prevalence and type of problems

Estimates of prevalence of psychological and psychiatric problems vary depending on the diagnostic criteria, time frame and population studied. In 1952 Watts and Watts[226] from three surveys, each of 1000 consecutive cases seen during routine surgeries, estimated the proportion of psychiatric to other forms of illness to be approximately 13%. The pioneering work of Shepherd *et al*[227] in 1966 and subsequent research has confirmed that a substantial proportion (between 20% and 25%) of patients consulting their GP are suffering from some form of psychiatric disturbance.[228-230] This is comparable with figures internationally. The World Health Organisation (WHO) sponsored prospective study of mental disorders in primary care conducted in 15 different centres across 14 countries.[231] It reported that 24% of general practice attenders had a current mental disorder reaching ICD-10 criteria, and another 9% had a sub-threshold disorder (clinically significant symptoms, but not meeting full criteria for ICD-10).

At the level of the individual consultation, data from the WHO study suggested that between 25 and 40% of general practice visits have a significant psychological component.[232] In the UK, Ashworth *et al*[233] characterised the burden of psychological problems according to GPs. The 22 participating doctors (based in nine practices) were asked to rate the psychological content of 2206 consultations on a four point scale (from no psychological content to entirely psychological in content). The mean psychological content score was 0.58 (SD 0.33), with 64% of consultations being devoid of psychological content and 6% entirely psychological in content. Further information on the prevalence of psychosocial issues in patient-doctor encounters comes from a study by Levinson *et al*[234] of community-based practices in Oregon and Colorado in 1994. They audio-taped and transcribed routine visits to 54 primary care physicians and 62 surgeons, looking for patient "clues" (direct or indirect comments about personal or emotional aspects of their lives). Of the 116 consultations, 52% of featured one or more clues (mean 2.6). 76% of patient-initiated clues were emotional in nature, often (80%) related to psychological or social concerns in patients' lives.

The range of emotional problems that GPs encounter in their everyday clinical practice is wide, from psychological responses to physical illness and various difficulties that cause distress to obvious manifestations of mental illness.[235] The majority of patients have non-psychotic syndromes or "neurotic disorders", with depressive and anxiety symptoms predominating.[225;227]

3.3.1.2 Conspicuous and hidden psychiatric morbidity

The terms conspicuous psychiatric morbidity and hidden psychiatric morbidity, to distinguish between identified and unidentified disorders, were first coined by Goldberg and Blackwell[228] in 1970. Two kinds of research design have been used to investigate GP detection of disorder in their patients.[225] In the first, a psychiatric screening questionnaire is administered to patients consecutively seeing a doctor, and the doctor is asked to rate how psychologically distressed each patient is thought to be. The most commonly used screening instrument is the General Health Questionnaire (GHQ). The second type of study confirms the presence of a mental disorder in a patient by a standardised research interview.

How significant a problem is non-recognition of mental illness? Ormel *et al*[236] reviewed 11 studies of "hidden" and "conspicuous" morbidity of mental illness in primary care showed substantial non-detection rates. Frequencies of GHQ high-scorers ranged from 21% to 52%, whereas GP cases ranged from 14% to 36%. Between 40% and 70% of the GP patients with an anxiety or depressive disorder were not assigned a specific mental diagnosis by their GP. GPs vary widely in their detection rates for psychiatric disorders[237] and there is considerable variation between doctors in different places in the amount of mental disorder identified.[225]

Two systematic reviews have been recently published regarding recognition of depression specifically.[238;239] The review by Cepoiu *et al*[238] included studies of non-psychiatrists (36 papers, 27 conducted in primary care) whilst Mitchell *et al*[239] focused on GPs only (41 studies). Cepoiu *et al*[238] reported the following summary statistics of recognition: sensitivity (36.4%, 95% CI 27.9% to 44.8%), specificity (83.7%, 95% CI 77.5% to 90.0%) and diagnostic odds ratio (4.0, 95% CI 3.2 to 4.9). Mitchell *et al*[239] found that GPs correctly identified depression in 47.3% (95% CI 41.7% to 53.0%) of cases; with a sensitivity of 50.1% (95% CI 41.3% to 59.0%) and specificity of 81.3% (95% CI 74.5% to 87.3%). (Validity coefficients are described in section 7.6.2.2.) Therefore, doctors are better at successfully ruling depression in than they are are excluding it.

3.3.1.3 Does detection of psychological problems matter?

Psychological distress in patients consulting in primary care is therefore common and GPs vary in their detection of these disturbances, but does this matter? Because of differences between primary and secondary care populations the consequences of non-recognition may be less dramatic. Sireling and colleagues[240] compared patients with depression prescribed an antidepressant in general practice with antidepressant-treated psychiatric out-patient depressives. General practice patients had generally milder cases of depression, with shorter illnesses and lower severity scores. Other research has shown that disorders that are missed tend to be mild and associated with less disability than those that are detected. Coyne and colleagues[241] investigated family physicians in Michigan. Doctors in their study detected 34.9% of cases of major depression and 27.9% of cases of any depressive disorder, but undetected depression was milder than the detected depression and associated with less psychological distress and higher global functioning. Jackson *et al*[242] reported on the five year outcomes of patients with and without mental disorders. A cohort of 500 participants was recruited from adults who presented to an army medical centre in Washington, DC, with a physical symptom as their primary problem. According to the Primary Care Evaluation of Mental Disorders (PRIME-MD) tool they employed, at baseline 29% of patients had a mental disorder and of these patients, 26% had more than one mental disorder. Over five years (n=387), 33% were recognized. Threshold disorders were more likely to be recognized than sub-threshold disorders, but most patients with sub-threshold disorders at baseline had no disorder at five years. These findings are limited by the fact that participants were recruited from a single medical centre and the investigator's relied on patient self-report to assess the diagnosis and treatment of mental disorders.

On the counter side, there are at least four reasons to suppose that detection of psychological problems does matter. The first, and perhaps most elementary reason, is that patients may feel better for simply being able to disclose and discuss their suffering. Martin and Bass[243] examined the effect of discussion of non-medical problems among patients with chronic illness who were attending a known family physician in Canada. Of 149 patients interviewed, 90.6% reported at least one non-medical problem. Just over half (51%) of these patients had discussed it with their doctor and 55% of them reported that the discussion was helpful (patients feeling that they had been given a chance to say what was really on their mind and reporting that they had been told what they wanted to know about their illness). This in turn was linked with patient satisfaction and compliance. Bertakis *et al*[244] analysed tape recordings of 550 return visits to 127 different physicians at 11 sites across the USA. They found that patient satisfaction was positively associated with physician questioning about and counselling for psychosocial topics, and patient talk regarding psychosocial topics. In the UK, Cape interviewed 88 patients presenting to nine GPs in London for help with emotional problems and analysed their audio-taped consultations. Positive patient experience was linked to listening interactions and for doctor empathy.

Second, non-recognition may deprive individuals of appropriate treatment.[245] In the Global Burden of Disease study,[246] depressive disorder claimed the highest percentage of disability-adjusted life years and poor mental health is a major predictor of future poor physical health. In a systematic review of the burden associated with major mental disorders in adults, Eaton *et al*[247] estimated that depressive disorder raises the risk of all-cause mortality by about 70 percent, with an inter-quartile range of relative risks of 1.3 to 2.2.

Third, there may be potential costs to the health service from recurrent consultations by patients with unresolved problems. Wright[248] followed-up a random sample of 186 patients attending one general practitioner in Scotland. Patients with persistently abnormal GHQ scores showed high consultation rates persisting over several years. Analysing cross-sectional data from a managed care organisation in Rochester, New York, Campbell *et al*[249] reported that expenditure was lowest among physicians who recorded more mental health diagnoses.

Fourth, as discussed below (see 3.3.2.1) patients in primary care with psychiatric disorders commonly present with physical symptoms, which can lead to inappropriate investigations, referrals or treatment. The concern is that failure to diagnose and treat psychological distress appropriately may promote chronicity and somatic fixation.

3.3.2 Detection of patient psychological distress

Aspects related to the patient, the doctor and the consultation have been shown to affect detection of disorders. Key patient and doctor factors are reviewed first, before focusing on consultation factors and a possible role for continuity.

3.3.2.1 Patient factors

GPs' detection of psychiatric distress has been shown to be affected by patient sociodemographic characteristics, type and severity of psychiatric disorder, co-morbidity, self-perception of health status, functional disability, and reason for medical consultation.

Doctors have been reported to detect psychiatric distress more frequently among female, widowed, separated, and unemployed persons,[237] although other authors have found that demographic characteristics linked with recognition reflect different levels of association with psychopathology.[250] Characteristics of the disorder may play a role as well: depression is better recognized than anxiety disorder[251] and more severe disorders are better recognized than mild forms of psychopathology;[241;251;252] Wilmink and colleagues[253] reported that the Dutch physicians in their study tended to under-identify mental health problems in "new" patients (defined as people in whom the GP had not identified a mental health problem in the past year) and over-identify them in "old" patients. In a Spanish study, Aragones *et al*[254] found that a previous history of depression was associated with over-diagnosis of depression. Research on the effect of physical co-morbidity is mixed, with some studies finding that chronic physical co-morbidity decreases the probability of depression being discussed or noticed during a clinic encounter,[255-258] whereas others report that depressed people with chronic medical conditions received similar[259;260] or better[261] treatment than depressed people without chronic medical conditions. Olfson *et al*[262] found that primary care physicians' identification of mental disorders was hampered for physically healthy patients who have a poor health self-perception.

Studies on the effect of functional disability on recognition have shown more consistent findings. Simon and Von Korff[250] showed that patients with any recognized type of depression had significantly greater disability than those with unrecognized depression, and Tiemens *et al*[252] found that psychiatric distress was recognized in 85.4% of patients with severe disability compared with 44.5% of those with no disability, independently of psychiatric diagnosis.

As mentioned above, some non-detection may occur because distressed patients present only somatic symptoms or attribute physical symptoms to physical illnesses.[263;264] Using data from the Dutch National Study of Morbidity and Intervention in General Practice study, Verhaak and Tijhuis[265] followed-up two cohorts of patients. During a three month period, members in the first group articulated at least one demand for psychosocial help, whereas patients in the second cohort presented at least one somatic symptom but no psychosocial complaint. They concluded that many patients with a probable mental illness (according to the GHQ-30) present only physical symptoms, but that the severity of their distress however appears to be less than that of patients with a probable mental illness who do express their psychological distress overtly. Between 1991 and 1992, Weich *et al*[266] recruited 301 patients aged 17 to 66 years who consulted a single GP working in London. Based on the GHQ-12, 59% were estimated to be probable cases of psychiatric morbidity. Psychiatric morbidity was detected in all of the psychological presenters, but in only 19.7% of somatic presenters. Similarly, in a study of patients seen by primary care physicians working in Santiago, Chile, Araya *et al*[267] showed that doctors were more likely to identify patients with mental disorder who attributed their symptoms to a psychological cause than to a physical cause. Kessler *et al*[268] examined the effect of patient symptom attribution on GP detection of depression and anxiety in consecutive attenders at one practice in Bristol. Patients who made global psychologising attributions were more likely to receive a psychological diagnosis whereas a normalising style of attribution had the opposite effect. Somatising attributions, which were the least common, had no measurable effect on diagnostic rates, though this may have been because of lack of statistical power. However, in a similar study in London, Bower *et al*[269] found that the symptom attribution styles of patients did not consistently predict an accurate recognition of psychiatric morbidity by general practitioners. They concluded that how patients' specific attributions concerning the main presenting problems influence physician recognition should be examined, a suggestion taken-up by Greer *et al.*[270] Participants in this study were consecutive patients seeking consultations at an urban primary care office located in Western Massachusetts, USA. Greer and colleagues[270] demonstrated that, in addition to global symptom attribution styles, patients' specific beliefs about their presenting symptoms strongly predicted the likelihood that physicians identified patients as distressed.

Even if patients recognise their symptoms as being psychological in origin, they may hesitate to discuss them for a variety of reasons. Disclosure has been linked to a positive attitude to confiding[271] whereas patients who feel their problem is trivial, not easy to talk about or stigmatizing are more hesistant.[272;273] In depression, discussion may also be linked to a positive patient attitude toward treatment.[257]

3.3.2.2 Doctor factors

Clinician age, gender, ethnicity and personality characteristics have all been thought to influence recognition and management of psychosocial problems, but there is little evidence to support this.[274] GPs' knowledge about and experience of mood disorders may also influence detection. [275-277] Other work has suggested that GPs associate certain illness behaviours with a diagnosis of emotional disorder, for example frequent consultations or multiple symptom patterns.[278;279]

Physician attitude is a complex factor, which implies whether a GP is orientated towards psychological medicine or not. Possible reasons underlying a negative attitudes decribed by Ormel and Tiemens include "the fear of discussing psychosocial issues, unwillingness to confront patients with a psychiatric diagnosis because of stigma, therapeutic nihilism, and a belief that most episodes of psychological distress are self-limiting or do not lend themselves to diagnosis in terms of the official psychiatric nosologies".[280] In whatever way physician psychosocial orientation has been operationalised, doctors with a greater sensitivity to psychological issues have been found to make more diagnoses of psychosocial factors being relevant to the consultation (though this does not always make them more accurate).[230;237;253;281] Bower *et al*[282] has shown that recognition of patient distress was related to patient's perception of the degree to which the GP was oriented to the management of emotional problems. Of course, if a doctor's psychological orientation becomes over-inclusive, they run the risk of prematurely dismissing the possibility of an occult organic disease or alienating patients who resent a psychological interpretation.[283]

3.3.2.3 Consultation factors

Consultation research has shown that better recognition occurs in those encounters where the consultation is longer and where the general practitioner uses certain communication skills.

3.3.2.3.1 Consultation length

In qualitative studies, patients[272] and GPs[279] have identified lack of time as a barrier to the disclosure and identification of psychosocial issues respectively. This finding is supported by quantitative investigations of consultation and detection of distress. In 2002 Wilson and Childs[176] systematically reviewed the literature for associations between consultation length and healthcare processes and outcomes. More recently

(2007), Hutton and Gunn[284] published a systematic review specifically exploring the associations between consultation length and the management of psychological problems.

14 out of 16 studies identified in Hutton and Gunn's review suggest that consultations with a recorded diagnosis of psychological problems take longer. These studies were conducted in a ten different countries with varying average consultation lengths, and some were large (from 1000 to over 100 000 patients, and from 100 to over 1000 doctors). Given longer consultations, doctors have also been observed to ask more psychosocial questions.[182] Similarly, Winefield *et al*[285] observed that patient-centred consultations take longer and deal with more psychosocial and complex problems.

It is therefore perhaps unsurprising that since the earliest detection studies,[237] longer consultations have been associated with better recognition of psychological distress. In the UK, Howie and colleagues[175;286] conducted a large study to assess the effect of consultation length on the recognition and management of patient problems. They recruited 85 GPs from the Lothian region of Scotland to record information on all surgery consultations on one day in every 15 for a year. On the basis of their mean consultation times doctors were categorised as fast, intermediate or slow, and the 21 707 consultations which they carried out were classified as short (five minutes or less), medium (six to nine minutes) or long (ten minutes or more). Long consultations as against short consultations were associated with the doctor dealing with more of the psychosocial problems which had been recognized and were relevant to the patient's care.[175] In a subset of consultations for respiratory illness, psychosocial problems were more likely to be recognised by slower GPs (fast doctors 28%, intermediate doctors 31% and slow doctors 33%), and if recognised dealt with (11%, 10% and 20% respectively).[286] However, in these studies[175;286] diagnosis of a psychological problem and whether it was addressed were according to doctor self-report. Stirling *et al*[287] on the other hand compared the doctors rating of psychological distress with patient GHQ-12 scores. They studied 1075 consultations of 21 full-time GPs working in nine practices in the West of Scotland. Accurate recognition of psychological distress was found to be greater in longer consultations, with a 50% increase in consultation length being associated with a 32% increase in recognition. The tendency for identification to increase with longer consultations was greatest in the shorter consultations (up to six minutes). Only Ridsdale *et al*[183] has reported that longer consultations did not lead to more psychological diagnoses, but this was based on medical notes review.

3.3.2.3.2 Communication

Doctors' interview skills are the most notable factor in detection of psychosocial problems and psychiatric disorders. Research has identified the interviewing skills that discriminate doctors who identify emotional distress from those who often miss it.

In the classic study by Marks *et al*[237] in 1979, doctors with a high identification index[a] were observed to demonstrate more interest and concern for the patient. More detailed analysis showed that these doctors asked more questions with a psychosocial content and were better at clarifying the patient's complaint, picked up more cues relating to emotional distress, and were more able to deal with interruptions and with over-talkative patients. Verhaak[288;289] demonstrated that more patient complaints were interpreted as non-somatic and treated as such when doctors' communication with a patient was in an "open" conversational style. However, this study did not deal with the accuracy of recognition but with the GPs' bias: the tendency of the doctor to interpret complaints as psychosocial. Relations between certain communication behaviours and physician accuracy have been confirmed by subsequent work, notably that of Goldberg *et al*,[290] Gask *et al*[291] and Robbins *et al*.[283] To summarise this body of work, accurate physicians make more eye contact, maintain a natural flow of open and closed questions, interrupt the patient less in the early stages of the counter, ask direct questions with a psychosocial content, and are alert for verbal and nonverbal cues that may reveal emotional distress. Accurate doctors are particularly skilled in doing the right thing at the right time. Giron *et al*[292] have confirmed that active listening and asking questions with psychological content were associated with the ability to identify the patient's emotional problems, independent of the severity of the complaint, the duration of the consultation, or the

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[a] The identification index is the ratio of observed to expected true positives, and is hence "a measure of the ability of the doctor to identify probable cases correctly"[225]

characteristics of the physician and patient. A paper by van der Pasch and Verhaak[293] in 1998 seems to contradict some of these findings. They observed communication skills were positively (if non-significantly trend) associated with GP's bias but negatively (again, non-significantly) associated with GP's accuracy. However, this result might be explained by a number of methodological issues, including: data came from the Dutch National Study of Morbidity and Interventions in General Practice, so that only patients whose mental health was assessed by the GP were included; important patient variables, such as severity of illness, were not adjusted for; and GPs were asked to assess the psychosocial nature of their patients complaints, not their general mental state.

A highly relevant review is therefore that recently published by Zimmermann *et al.*[294] They reviewed the peer-reviewed research literature on cues and concerns published between 1975 and 2006. In primary care, they noted that patient-initiated cues appear to be about three times more frequent than doctor-initiated cues,[234] yet the opposite emerged for patients' concerns in terms of psychosocial disclosure.[295] In respect of emotional cues, Davenport and colleagues[296] reported that non-verbal cues were three times more frequent than verbal emotional cues; and emotional cues were more common than cues regarding social worries,[234] but only half as frequent as illness-related cues.[297] Multiple studies have shown that the number of cues expressed by primary care patients increased significantly with patients' emotional distress, according to the GHQ.[295-298] Hall *et al*[299] reviewed four studies with meta-analytic procedures and found that patients with mental health problems presented significantly more emotionally laden statements than did patients without these problems. Robinson and Roter[295] reported that solicitation by the physician increased the proportion of psychosocial disclosure by 24%.

3.3.2.4 Continuity

The majority of studies of GP detection are cross-sectional, so one of the criticisms levelled at them is that whilst doctors may not identify distress at the index consultation, they may go on to do so during subsequent encounters. The work of Kessler *et al*[300] and the MaGPIE group[301] provides some evidence for this. Kessler and colleagues[300] reported in 2002 on a three year follow-up study to their original 1997 investigation of GP detection of common mental illness in Bristol. In the original study, according to the GHQ 49% had depression or anxiety, but only 39% of these received a diagnosis of depression or anxiety. Of those not detected in 1997, 41% went on to receive a diagnosis and 30% were no longer GHQ cases. Therefore although many psychologically distressed patients did not receive a diagnosis at the index consultation, most either went on to be diagnosed at a subsequent consultation or recovered. The MaGPIE group in New Zealand linked consultation frequency with improved recognition of mental health problems.[301] Overall GPs in their study identified 63.7% of patients with a composite international diagnostic interview (CIDI) disorder, compared 80.2% of patients who had been seen five or more times and 28.8% of patients who had not consulted at all during the previous year. However, although these studies provide us with some insight into the effect of time, and possibly the influence of patient-practice continuity, it does not tell us anything about the significance of on-going patient-doctor relationships. Although communication skills are important in the detection of psychologically distressed patients, and patient-doctor communication is affected by continuity, and there is some research to suggest that patient-doctor continuity itself may be a significant factor.

From the perspective of doctors, Klinkman[274] has suggested that personal knowledge of patients might affect the provision of psychosocial care in either direction. On the one hand, clinicians may be reluctant to attach psychiatric diagnoses to patients they know well, whilst on the other they may be reluctant to discuss psychosocial problems with new or unfamiliar patients. GPs interviewed by Howe[279] thought the previous relationship could help or hinder in this process, yet prior knowledge of the patient may be necessary to discern changes in patients' pattern of presentation, which may point to underlying distress. As far back as 1973, Balint and Norell[302] described how GPs "tuned into" patients' problems, physical and psychological, over the course of several consultations. Therefore, assessing a GP's ability during a single consultation may be inappropriate. Baik *et al*[303] conducted in-depth interviews with eight purposefully sampled clinicians (three family physicians, two general internists, and three nurse practitioners) from Ohio. They found that familiarity with the patient had an important influence on the strategies that they used to recognise depression. Participants said they were more reluctant to diagnose depression in unfamiliar patients, and felt making the diagnosis was made even more difficult because such patients were less likely to share personal information.

On the patient side, although there is much in the general continuity literature to suggest that developing a relationship with a doctor over time may increase the likelihood of patient disclosure, and hence detection, there is little research to support this hypothesis. In fact, semi-qualitative studies with primary care patients in the UK[272] and New Zealand[273] suggested seeing a known doctor may act as a barrier to discussion of emotional issues. The most common reasons for patients not disclosing distress given by Cape and McCulloch[272] were patient perceptions of lack of time and that there is nothing doctors can do to help. However, eight of the 64 patients said they were deterred from talking to the GP because of what the doctor said or did previously. In another report from the MaGPIE group,[273] 33.8% of participants felt that GPs were not the right person to talk to, 27.6% that mental health problems should not be discussed at all, and 20.6% that their *own* GP was not the right person for them to talk to. As part of the survey published in 1986, Roland and coworkers[42] reported that patients from personal list practices in Bristol were no more likely to be prepared to discuss a personal matter with their doctor than patients from the combined list practices.

In contrast, Freeman and Richards[41] found that patients who desired continuity compared with those who did not were more likely to be willing to discuss a personal problem with their usual doctor. Indeed, a number of studies that have actually investigated identification of psychosocial and psychological problems suggest that it is affected by patient-doctor continuity. In Baltimore, USA, Robinson and Roter[295] investigated factors associated with psychosocial problem disclosure among adult patients with a GHQ-28 score of five or greater. Consultations were audiotaped, coded for problem disclosure, and using generalized estimating equation modelling comparison made with primary care physician assessments. The odds of disclosure were increased by the physician enquiring about psychosocial problems, greater perceived physician familiarity with patient (not at all, slight, moderate or high) and greater severity of patient psychological distress. Robinson and Roter also reported two interactions. First, a negative interaction between prior physician inquiry and physician-patient familiarity, so that their combined effect on disclosure exceeded the effect of either variable alone. Second, a complex interaction between number of prior visits, gender and income: primary care physician recognition of GHQ cases of distressed patients was more likely for lower income females who had seen the primary care physician previously.

Other studies conducted in Norway,[304] Israel[305] and Jordan[306] have linked identification of patient distress to doctors' knowledge of patients. Using data on 1401 adults, Gulbrandsen *et al*[304] explored 89 Norwegian GPs' knowledge of their patients' psychosocial problems. Around one-third of patients had psychosocial problems that they thought were influencing their health and the doctors in this study recognised a fifth to a half of these problems. GP recognition varied according to the patients' problem, their sociodemographic characteristics, and the doctors' previous general knowledge of them. Good previous knowledge (good or very good versus some or not at all) of the patient increased the odds for the doctor's recognition of "sorrow", "violence or threats", "substance misuse in close friend or relative" and "difficult conflict with close friend or relative". However, a further analysis of the data[307] showed a difference between male and female patients: good GP previous knowledge of the patient was associated with disclosure in women but not men. (A similar distinction was observed in a study in Italy on patients attending male GPs: Del Piccolo and coworkers[271] only found an association between duration of patient-GP relationship and disclosure of stressful life events and social problems among female patients.) Shiber et al[305] found that familiarity with the patient predicted a better match of Israeli physician classification to GHQ-28 defined cases. Only 8.2% of the patients for whom this was the first encounter with the physician were true positives, compared to 24.9% of those whom the physician reported were known to him or her, and 31.1% of those known very well. In a study of four primary care centres in North Jordan in 1995, Al-Jaddou and Malkawi[306] using an Arabic version of the GHQ-28 reported a psychiatric morbidity prevalence of 61% and a physician detection rate of 24%. Recognition of this morbidity was significantly greater in patients previously known to their physicians.

Nonetheless, like the qualitative work in this area, not all quantitative investigations have been positive. As part of a validation study for their PRIME-MD (Primary Care Evaluation of Mental Disorders) instrument, Spitzer *et al*[308] collected data from adults assessed by primary care physicians at primary care clinics in USA. Their report suggested that nearly half of patients with a specific DSM-III (Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition) disorder who were somewhat or fairly well-known to their physicians had not been recognized. Equivocal evidence on the value of continuity and emotional distress from a longitudinal, observational study of parent-physician interaction over one year comes in two papers by Wissow *et al.*[309;310]

The first article was published in 2002. Wissow and colleagues[309] used data collected as part of a clinical trial of injury prevention to investigate whether continuity was associated with increased discussion, disclosure and/or detection of parents' social and emotional distress and whether participating physicians' communication behaviours changed over time. It was set in a paediatric primary care clinic of an urban teaching hospital in USA and 190 parents of infants six months of age or younger were recruited. Continuity was operationalised in terms of the number of visits (one to five visits compared with six or more, and median number of visits or less compared with greater than median number) to an assigned primary care physician and the COC index. Research assistants attempted to audio-tape consecutive visits and parent-physician talk was subsequently coded using the Roter Interactional Analysis System (RIAS). At each visit parents completed the 28-item GHQ and physicians rated the parents' emotional health on a scale of excellent, good, fair, or poor. On average, infants saw their assigned physician for 92% of the primary care visits (range 22% to 100%) and 71% of all visits at the medical centre (range 6% to 100%). The COC index averaged 0.72 (range 0 to 1). Forty-eight (25%) of the parents scored positive on the GHQ at one or more visits. Visits where the parent scored positive on the GHQ were distributed evenly across the time span of parent-physician relationships. Whilst communication skills improved parents' discussion of distress neither a higher number of visits nor a greater proportion of care from the same physician (COC score above the 25th percentile) appeared to promote discussion or detection of parental distress. In fact, physician initiation of psychosocial topics fell with increasing number of visits. Parent initiation did not change with time or greater levels of continuity. However, the generalisability of these findings may be limited. First, the study's parents were largely young African Americans from low-income neighbourhoods, and 75% of the physicians were female. Second, visits lasted a median of 25 minutes (range 2 to 91 minutes). Third, of first-recorded visits, only 50% were of the parent's actual first or second visit with the physician, while the remainder of first-recorded visits ranged from the third to the seventeenth actual visit. Fourth, missing data for some visits meant their analysis had to use averaged trends over time. Key visits at which important topics were discussed may have been missed.

Yet, in the later paper using an expanded data set Wassow *et al*[310] do report an association between longitudinal care and psychosocial information disclosure. Two reasons may explain the different findings. First, in addition to the data analysed in their original paper, they include an additional 187 parents about whom data were limited to a single enrolment visit. Second, they looked for the effect of parent and physician sex and ethnicity on interactions at the first and subsequent visits. They found that whilst at the initial visits African American mothers seeing white physicians gave less psychosocial information than that of white mothers, when paired with female white physicians, African American mothers gradually increase their psychosocial information giving over time. This effect was sufficiently pronounced that, averaged over the entire study period, mother's ethnicity was not associated with differences in psychosocial information giving. Meanwhile, white mothers seeing a male white physician was initially associated with giving less psychosocial information compared with seeing a female white physician, but there was also evidence of an increase over time. However, white mothers overall still gave less psychosocial information to male white physicians compared with female white physicians.

Finally, two studies have suggested that continuity may make doctors more sensitive but less specific in their identification of emotional distress. In a recent Australian study by Haller *et al*[311] of young people (16-24) attending their practice, among other factors GPs' correct identification of emotional distress was associated with frequent consultations and patients seeing their usual doctor. However, they also reported that continuity appeared to favour over-identification in those who were unlikely to have a mental disorder. Rosenberg *et al*[312] looked at factors associated with primary care physician identification of psychological problems in patients with normal

GHQ-28 scores in Montreal, Canada. They found the physician not knowing the patient well was associated with less frequent detection.

3.3.3 Summary

Mental health problems are common in primary care, and outwith issues of detection there may be good reasons to promote continuity in the care of these patients. GPs encounter patients with a range of psychological issues, and the boundaries between problems of living and formal psychiatric disorders may be less clear cut for them than for doctors working in secondary care settings. However, in order to deal with patients' complaints in a holistic way and to be able to offer the most appropriate advice, treatment or referral in any given consultation, it is incumbent upon the GP to be aware of emotional factors.

GPs' identification of patient psychological distress has been the subject of extensive investigation, and communication has emerged as a key skill which can be modified and hence doctors' abilities in this area improved. Consultations between patients and doctors are affected by prior knowledge of one another, yet the role of patient-doctor continuity in recognition of psychological issues is uncertain. There are reasons to suppose that seeing the same doctor could have a positive or negative effect, and as a modifiable factor, it warrants further explanation.

There is a lack of evidence about the impact of continuity on patient outcomes. Applying the model of patient-doctor continuity proposed earlier represents an opportunity to explore the influence and interplay of longitudinal care, consultation, and depth of relationship factors on GP detection of patient psychological distress – an outcome which is relevant and potentially important.

4. Aims, objectives and hypotheses

4.1 Introduction

Continuity of patient care is a core characteristic of primary care and proponents argue that it is important for healthcare processes and/or outcomes. However, as the review of the literature in chapter two highlighted, the evidence to support this is weak. One reason for this may be because it is still a poorly defined and conceptualised topic.

A model was presented in chapter three which might advance how we evaluate the value of patient-doctor continuity. It explicitly distinguishes between longitudinal care, consultations and depth of relationship dimensions, elements that, among others, may be important in the detection of patient psychological distress.

4.2 Overall aim and hypothesis

This overall aim of this study is to explore patient-doctor continuity in longitudinal care, consultation and depth of relationship terms, and to examine whether continuity of GP is associated with better detection of psychological distress in patients consulting in primary care.

The overall hypothesis is that seeing the same doctor and having satisfactory consultations with them contributes to the development of a depth of patient-doctor relationship, which in turn leads to improved GP detection of patient psychological distress.

4.3 Development of patient-doctor depth of relationship questionnaire

It was shown in the preceding chapter that existing measures of patient-doctor relationships are limited (3.2.2.2), having been designed to capture one aspect of depth of relationship such as trust for example. In addition, they were not produced with a theoretical underpinning that distinguished between longitudinal care, consultations and depth of relationship dimensions. For these reasons, the first part of the thesis concerns the development of a new questionnaire to measure patient-doctor depth of relationship.

AIM 1: To develop a patient self-complete questionnaire suitable for use in GP surgeries (by patients aged 16 years and older) that specifically measures depth of patient-doctor relationship from the patient perspective.

The objectives of this section are therefore to:

- Generate candidate items and response scales to be used in the new questionnaire
- Pilot draft versions of the questionnaire
- Psychometrically evaluate the reliability and validity of the draft questionnaire
- Produce a shortened final questionnaire that can be treated as a scale to give a depth of relationship score

4.4 Main study

The second part of the thesis uses the newly developed patient-doctor depth of relationship questionnaire to explore associations between longitudinal care, patient-doctor depth of relationship and GP detection of patient psychological distress. Data will be collected in a single main study.

AIM 2: To estimate the associations between longitudinal care, depth of relationship and GP detection of patient psychological distress, independent of other potential confounding factors.

4.4.1 Patient-doctor longitudinal care and depth of relationship

Continuity research has not examined whether longitudinal care is associated with a depth of relationship between patient and doctor, from the patient perspective.

HYPOTHESIS 1: Independently of other factors, longitudinal care contributes to the development of patient-doctor depth of relationship.

In order to investigate this hypothesis, the following objectives will be met:

- Obtain data on and derive summary measures of patient-doctor:
    - longitudinal care
    - depth of relationship

- Collect data on factors that might confound an association between longitudinal care and depth of relationship:
    - patient sociodemographic and health characteristics
    - consultation characteristics, especially doctors' communication skills and length of consultation

- Estimate the associations between longitudinal care and depth of relationship. Initially crude and then after adjustment for potential confounding factors.

- Explore possible interactions. Depth of patient-doctor relationship may be established in fewer consultations:
    - by GPs with superior communication skills
    - if a higher proportion of doctor visits are with the study GP

4.4.2 Patient-doctor continuity and GP detection of patient psychological distress

It is not clear whether continuity of doctor affects GP detection of psychological distress in their patients.

HYPOTHESIS 2: Independently of other factors patient-doctor continuity is associated with better detection of psychological distress in patients by the GP.

Having already examined the association between longitudinal care and patient-doctor depth of relationship, any possible association between continuity and detection of distress will be primarily examined in depth of relationship terms. However, it may be that seeing the same doctor, rather than the relationship that develops between patient and doctor is what matters. For this reasons, secondary analysis looking for associations between longitudinal care and GP detection of patient psychological distress will also be performed.

Objectives to test the second hypothesis, in addition to those listed above for hypothesis one, are therefore:

- Obtain data on patient psychological state according to:
    - a validated measure of patient psychological distress and
    - GP assessment

- Collect data on potential confounders in an association between continuity and GP detection of psychological distress in patients:
    - patient symptom attribution
    - previously identified patient current mental health problem
    - GP psychological orientation

- Estimate the associations between patient-doctor continuity and GP detection of patient psychological distress. Initially for crude associations and then after adjustment for possible confounders.

5. Overview of study

5.1 Introduction

This chapter introduces the research that was conducted to meet the aims and test the hypotheses listed in the previous chapter: a patient-doctor depth of relationship questionnaire development phase; and a cross-sectional study exploring the association between longitudinal care, depth of relationship, and GP detection of patient psychological distress.

Both stages jointly received ethical and clinical governance approval and were conducted in the same region of the UK. Because questionnaire design and administration were integral to both stages, common methodological issues are also discussed here.

5.2 Study design

5.2.1 Patient-doctor depth of relationship questionnaire

The patient-doctor depth of relationship questionnaire was conceptually based on the findings of a synthesis of qualitative studies of patient-doctor relationships from the perspective of patients by Ridd *et al*[143] (see chapter three). During a pre-pilot phase, patients recruited via their GP commented on the content, layout and ease-of-completion of early versions of the instrument. The resulting draft questionnaire was piloted in two rounds with patients attending for GP consultations. The data were analysed to check the reliability and validity of the question items, and to produce an improved, shortened final version for use in the cross-sectional study (aim one).

5.2.2 Patient-doctor longitudinal care, depth of relationship, and GP detection of patient psychological distress

This study was cross-sectional in design. GPs were recruited to take part in study surgeries, during which they and their patients were asked to complete questionnaires. Where patients' consented, data were also collected from the electronic medical records (aim two). The data were analysed to look for associations between longitudinal care and depth of relationship (hypothesis one), and longitudinal care, depth of relationship and GP detection of psychological distress in patients (hypothesis two).

5.3 Ethics and clinical governance

Ethical approval was obtained from Southmead Research Ethics Committee (05/Q2002/1). Clinical governance approval was obtained from the relevant primary care trusts (PCTs). The University of Bristol agreed to act as research sponsor. People who where employed to assist in data collection obtained PCT approval in the form of an honorary contract.

5.4 Setting

The research was conducted with patients and GPs from practices in the old Avon area (Bristol, North Somerset and South Gloucestershire). Bristol had a population of 416 400 in 2007.[313] The proportion of black and minority ethnic residents, one person households and earnings are similar to those for England and Wales (Table 5-1) but compared to the national average unemployment is lower and educational achievement is higher.

The majority of GPs came from practices which were members of the Avon Primary Care Research Collaborative, an established local network of research active practices funded to support research. 31 practices took part in at least one part of the project (see Table 11-1, Appendix 11.1).

5.5 Questionnaire methodology

A significant component of this thesis concerns the design and use of questionnaires. In the first part a new patient-doctor depth of relationship questionnaire was developed. In the second part of the study, data were primarily obtained by self-administered questionnaires. This section therefore examines the issues that are germane to both stages of the project.

Table 5-1 Comparison of population characteristics of Bristol with England and Wales

	Bristol	England & Wales
Black and minority ethnic residents (2007 estimates)[314]	11.9%	11.8% †
One person households[315]	33.3%	30.0%
Earnings[316]	£24 900	£25 300
Unemployment rate[317]	4.7%	5.4%
Qualified to NVQ4 equivalent or above[317] ‡	36.5%	28.1%

† England only
‡ HND, degree and higher degree level qualifications and above

5.5.1.1 Administration

Questionnaires can be administered by a researcher or self-completed by the respondent. It was decided to use self-completed questionnaires because they are economical to administer, not subject to researcher bias and anonymity is more easily guaranteed. They also allow respondents to answer questions at their own pace and possibly more honestly. Disadvantages associated with their use are the comparative brevity and simplicity of the questions that can be asked, non-response to individual items and usually a lower response rate compared with questionnaires administered by a researcher.[318;319]

5.5.1.2 Design

Moser and Kalton wrote that questionnaire design should be considered "largely a matter of art rather than a science" in which "common sense and past experience are the surveyor's main tools."[320] Although there is a wide variation in the rigour with which researchers have developed existing questionnaires, there are good principles to be followed.

Questionnaires should be made as interesting as possible; be easy to use, process and analyse; minimise measurement error; and respect the respondent's dignity and privacy.[321] The aim is to maximise the quality of information (high cooperation, low distortion) captured.[319]

5.5.1.3 Item wording

The wording of questionnaire items is crucial since what is asked shapes how respondents interpret and answer the question.[322] The wording of items should be kept simple, free from bias and unambiguous. In particular they should not contain more than one concept and questions which are overly demanding, difficult to answer, time-consuming, embarrassing or potentially threatening should be avoided. The wording and sequence of the questions should motivate respondents. Attention should be paid to the order in which questions are asked, as this can influence the responses obtained.[321]

Standard questions were used or adopted in this study where possible. These are questions that have usually have been used extensively previously and proven satisfactory, and may have been assessed for reliability and/or validity. Their use draws on the expertise of others in designing questions and introduces the possibility of comparing and even combining data sets in, for example, later meta-analyses. However, care was taken to evaluate such questions for: the adequacy of their design; their appropriateness to the objectives of the study; and their suitability for use in the population on which the study was conducted.[323]

5.5.1.4 Response scale

Question items can be open or closed-ended. Open-ended questions are most suitable for when there are a large number of possible answers, e.g. age. When the likely answer to an open-ended question is neither simple nor factual, the use of such a question increases the burden on both respondent and interviewer and produces answers that are difficult both to code and to analyse.[321]

Therefore closed-ended questions with a limited number of alternative response categories were generally used. This approach has main three main disadvantages.[321;324] First, because respondents are limited to answering the questions in a specific way, important dimensions not covered by the options may be missed.

Second, the categories offered may influence respondent's responses, particularly if the extremes offered are seen as outside normal social limits. Third, a large number of alternative responses increases respondent burden, increases the probability of non-response to the question and may increase the probability that one of the response items listed first will be selected. Hence, care was taken to ensure that alternative answers offered in closed-ended questions were simple, brief, and mutually exclusive.

5.5.1.5 Pre-testing

It is important that questionnaires are pre-tested before use.[325;326] Thereby questions that are poorly understood, ambiguous, or evoke hostile or other undesirable responses can be identified and modified or eliminated. All of the questionnaires used in this study were piloted before use. Most notably, the patient-doctor depth of relationship questionnaire underwent extensive testing as part of its development. During the second pilot it was embedded in a draft version of the patient questionnaire used in the main cross-sectional study.

5.5.1.6 Reliability and validity

Reliability and validity are key concepts in questionnaire development and use. Reliability is whether the instrument measures a quantity or concept in a consistent or reproducible manner. Validity is whether the instruments measures a quantity or concept that is supposed to be measured

The reliability of a particular measure is not a fixed property, but is dependent upon the context and population studied.[325] In practice, reliability is evaluated in terms of internal consistency and reproducibility. Internal consistency is an assessment whether responses to questions measuring the same or a related concept are consistent with each other. Reproducibility concerns whether the respondent gives the same answer to the same question at different times if the circumstances have not changed.

As with reliability, validity is not a fixed property of a measure; its validity is assessed in relation to a specific purpose and setting.[327] Face, content, construct and criterion are all different types of validity. Face validity is whether "on the face of it" questions are measuring what they are supposed to measure. Content validity is a judgement about whether the choice of items and the relative importance given to each is appropriate in the eyes of those who have some knowledge of the topic area. Construct validity is an assessment of whether expected statistical relationships are confirmed by the results obtained using the questionnaire, the expectations being derived from underlying theory. Criterion validity concerns whether the questionnaire yields results which corresponds with those obtained by another "gold standard" method. A major problem with assessing criterion validity is a lack of appropriate "gold-standard" comparisons, i.e. there is no independent way of ascertaining what is "true". In this situation other characteristics of the responses to the questions must be evaluated to assess their usefulness. In the end, the degree to which a question solicits true response may be a matter of judgement, bearing in mind the consistency of the response with those of other questions included in the questionnaire.[328]

As detailed in the following chapter, the development of the patient-doctor depth of relationship questionnaire was especially concerned with ensuring face and content validity. The questionnaire findings from the cross-sectional study, estimating an association between longitudinal care and depth of relationship, in effect provide some data on construct validity.

6. Development of patient-doctor depth of relationship questionnaire

6.1 Introduction

The chapter describes the development of the patient self-completion questionnaire which measures depth of patient-doctor relationship (thesis aim one, section 4.3). There were two stages to the questionnaire's development.

In the preliminary pre-pilot stage, potential question items were selected and trialled in patient interviews. In the main pilot, the resulting draft questionnaire was administered to patients attending their GP. Through two rounds of piloting, the questionnaire was refined and the final version used in the main study produced.

6.2 Justification of the need for a new questionnaire

The patient-doctor relationship is a complex topic and a satisfactory measure of depth of relationship from the patient perspective has not been devised for the following reasons.

As discussed earlier (see 3.2.2.2.1), some earlier studies have tried to quantify "depth" of patient-doctor relationship through the use of a single global question, such as "How well do you know this doctor?"[62;196] However, questions that ask about opinion or attitude are more difficult to verify, produce less reliable results and are also more sensitive to linguistic biases.[324] Also, single questions should not be relied upon for assessing such complex psychological concepts because patient-doctor depth of relationship may be poorly defined in many people's minds and terms may be misunderstood. To reduce the problems associated with relying on the wording and interpretation of a single question item, in these situations multiple deliberately chosen items provide a better approximation to underlying views.[329]

When multiple question items are used they can be developed as batteries or scales. Batteries of question items are a series of single items, each relating to the same variable of interest. Each item is analysed and presented individually. Scales involve a series of items about a specific domain that can be summed to yield a score. In order that they are not limited by the same types of error or question bias, items on the scale differ considerably in their content, i.e. they should all express a different belief about the area of interest. Averaging or summing responses across an appropriate set of questions gives a more reliable and valid measure than a single item or a battery of single items, because any individual item error or bias tends to be cancelled out across the items. Scales also permit more rigorous statistical analysis.

This thesis is founded on an explicit conceptualisation of the different component parts of patient-doctor relationships and how depth of relationship they might relate to longitudinal care. None of the published patient-doctor relationship scales have been designed as global measures of depth of relationship, underpinned by a longitudinal care-depth of relationship conceptual model, and created in primary care.

6.3 Methods

6.3.1 Setting

This work was supported by eight practices in total (see Table 11-1, Appendix 11.1). Three practices helped with two stages of development, and five were only involved in one. Practices were selected on the basis of their different location and size. Invitation was by letter and all agreed to take part.

6.3.2 Pre-pilot methods

The pre-pilot phase involved detailed work determining the content, balance and format of the new instrument. Care was taken to think carefully about the number, order, subject and wording of question items; the number and nature of the response categories; and the overall clarity and layout of the questionnaire.

6.3.2.1 Preparation

6.3.2.1.1 Item generation

The first step in developing a scale is to create a pool of questions, from which items for the draft questionnaire can be chosen. The aim at this stage is to be as inclusive as possible, because no amount of statistical manipulation can compensate for poorly chosen or worded questions.[325] In addition to the principles of good item construction generic to all questionnaires (discussed in section 5.5), there were principles specific to this study. These arose from the longitudinal care-depth of relationship conceptual model and the aims of the research.

First, the fore most aim was to devise a questionnaire that captures patient's perception of their on-going depth of patient-doctor relationship, not consultation dynamics such as the doctor's communication skills. Some useful comparisons can be drawn with the distinction between "causal variables" and "effect indicators", described by Fayers and Machin in their review of quality of life measures.[329] Causal variables contribute to the latent variable of interest, whereas effect indicators indicate or reflect the level of the latent variable. In the context of designing questions (variables) about patient-doctor relationships, effect indicators of the latent variable depth of relationship, not causal variables, were sought for inclusion. Second, the question items needed to be specific to the index doctor, independent of the patient's reason(s) for their visit, and relevant to both respondents for whom this was their first consultation with the doctor and those for whom it was one of a series.

Question items themselves can be general or specific in nature, and can elicit information about attitudes, beliefs, behaviour or attributes. It was decided that the items should be as specific as possible and should focus on patient beliefs about their relationship with their doctor. For example, "I feel relaxed with this doctor" (specific) instead of "I have a good relationship with this doctor" (general) and "This doctor really cares for me" (belief) rather than "She/he is kind" (doctor behaviour or attribute). This was for two reasons. First, to try and maximise the power of the questionnaire's to discriminate. The patient satisfaction literature suggest that patients report high levels of satisfaction in response to general questions, yet are more likely to be critical when asked about specifics. Second, because of a concern that questions asking about attributes might confuse on-the-day communication skills with on-going depth of relationship characteristics.

There are different ways for researchers to identify the issues that a questionnaire should cover. First, they can conduct focus groups or in-depth interviews with people who are representative of the opinions that would be elicited by the instrument. Second, they can draw on theoretical or conceptual models, which are often augmented by research findings. Third, workers can seek expert opinion, which may arise from clinical observation.

The findings of the qualitative literature synthesis by Ridd *et al*[143] served to provide both the content and conceptual basis of the patient-doctor depth of relationship questionnaire. To recap, this review synthesised the findings of 11 original qualitative studies and proposed a theoretical framework for understanding the longitudinal, consultation and depth dimensions of patient-doctor relationships. It also specifically identified four elements to patient-doctor depth of relationship (knowledge, trust, loyalty and regard). It was felt that further formal qualitative investigation of patient-doctor relationships using focus groups or interviews with patients for the purposes of questionnaire content was unwarranted. The expert opinion of the author's supervisors and advisory group, and members of the academic unit in which the work was conducted, also contributed to the questionnaire's development

The four depth of relationship elements described in the thematic synthesis were derived from 20 labels, which were attached to different aspects of patient-doctor relationships in the primary research papers. The author went back to the original 20 codes and wrote as many plausible question options as possible pertaining to the types of issue covered by each code. To do this, author mainly drew upon the definitions used in the development of the codes and the quotes to which they were attached. However, he also referred back to the existing questionnaires that had been identified earlier and added to the list any item that appeared to be representative of one of the synthesis codes. The synthesis highlighted the dyadic nature of the relationship, suggesting that paired question items may to appropriate for some aspects. For example, the literature around trust suggested that as well as patient trust in the doctor, patient perception of the doctor's trust in the patient needed to be considered. As a consequence, question pairs were purposefully constructed for some codes.

6.3.2.1.2 Format of question items and response categories

Closed-ended question items with discrete response categories were developed. Data collected in this format are useful for determining intensity of feeling and are suited to many forms of statistical analyses,[319] such as the psychometric techniques commonly used to develop an instrument scale and hence depth of patient-doctor relationship score. Potential disadvantages of this approach were discussed in section 5.5.1.4 and represent further justification for the pre-pilot phase.

6.3.2.1.3 Item selection for pre-pilot questionnaires

In respect of selecting items, the main emphasis at this stage was on face and content validity. Are the questions "on the face of it" measuring what they are supposed to measure, and are the breadth of questions and number of items about a sub-topic appropriate? Streiner and Norman[325] suggest that: each item should concern at least one content area, each content area should be represented by at least one question, and the number of questions in each area should reflect its importance (representativeness).

In order to get an idea of the relative importance of different aspects of relational depth, and hence the proportion of the question items that should be included in each area, all of the qualitative synthesis codes were ranked according to how often they were used in different studies, and how many studies had each code applied to them at least once. Of course, this may not reflect how often participants of the individual studies talked about certain topics, but it represented a guide as to their reported prominence.

Items were selected for use in a draft questionnaire. This was an iterative process which involved moving back and forth between the qualitative synthesis findings and the question item pool, until a suitable number of questions for early draft questionnaire were chosen. The balance of questions about the different depth of relationship codes and the suitability of the candidate items within each code were considered.

In respect of item suitability, some question items were clearly preferable because their face validity and simplicity were superior to the other putative options. For other depth of relationship codes, it was a more arbitrary choice on the grounds of a preference in wording or there was a limited number of ways in which the issue could be addressed. Because the depth of relationship codes were not exclusive, items that appeared to cover unique areas were favoured.

Finally, attention was paid to the overall wording and sequencing of the items to facilitate answers and motivate respondents.

6.3.2.2 Patient interviews

It is good practice to obtain patients' views at the pre-testing phase, prior to formal piloting for reliability and so on. Fitzpatrick *et al*[328] recommend undertaking structured interviews in which participants are asked whether they found any questionnaire items difficult, annoying or distressing, and whether any issues were omitted. Therefore, face-to-face interviews were conducted with volunteers drawn from local practice patient lists.

6.3.2.2.1 Recruitment

Patients were recruited via four practices. GPs in these practices were invited by letter to help identify and recruit five potential candidates each.

All of the GPs agreed to write on the author's behalf to patients who they thought would be willing to discuss their experiences of patient-doctor relationships and to help with the content and wording of items in a questionnaire. The GPs were told that ideally the patient volunteers should be of different sex and ages, and come from a range of educational and socioeconomic backgrounds.

Patients who were interested returned by post a chit with their contact details, age and sex. It was on the basis of this information, trying to obtain a spread of characteristics, that volunteers were contacted. Patients were serially recruited and interviewed until it was felt that the content and format of the draft questionnaire were reasonable.

6.3.2.2.2 Interviews

The author performed the interviews between August and October 2005. They started with an explanation of the interviewer's role and the purpose of the meeting. The value of the interviewee's opinion was emphasised. Written consent for note taking during and audio-recording of the interview were obtained, which comprised two parts.

First, participants were asked to talk about their own experience of good and bad patient-doctor relationships. This was done as a means of checking the qualitative synthesis findings and hence to ensure that the broad content of the draft questionnaire was balanced and comprehensive. Because patients invited by the GPs were likely to have good relationships with that doctor, they were specifically asked about problems with other doctors.

Second, participants were asked to complete a draft copy of the questionnaire. Respondents were observed and invited to make general comments about the appearance and ease of completion of the instrument, its comprehensiveness, and for any suggestions on how it could be improved. In addition, the principles of cognitive interviewing were followed, and participants were asked to "think aloud" as they answered questions and prompted to explain their thinking and choices.[330;331] For example, this included exploring what they thought a question was asking them or why they chose one response over another. Different versions of the questionnaire were tried in each interview. The questionnaire was modified in the light of patients' comments between interviews, so that the questionnaire evolved over the course of this phase. In addition, alternative number and wording of question items and response categories were tried. Negative statements and a "polar" question format (where the respondent was offered two opposing statements and asked to chose a response category which best reflected their opinion on the spectrum) were experimented with, to try and avoid the problem of response sets. A response set occurs when respondents tend to give the same response to each question regardless of what the true response should be.

The interview was concluded by asking some basic sociodemographic questions.

6.3.2.2.3 Analysis

Because this was a "checking exercise" rather than a formal qualitative study in its own right, the audio-recordings were not transcribed and no attempt was made to follow any specific analytical approach for reviewing the written and audio information collected. Instead, the interviews were listened to again, notes were re-read and a summary on each patient written. This was done interview-by-interview, so that any issues that emerged and/or the effect of any changes made to the questionnaire as a result of a participant's comments could be followed-up/assessed in the next interview.

6.3.3 Pilot methods

In the pilot phase, the acceptability, reliability and dimensionality of the scale were checked by analysing the responses of patients attending GP surgeries who completed and returned the questionnaire. The aim was to make the questionnaire as brief and as easy to complete as possible, yet still comprise as broad a range of questions as might be necessary to discern between different depths of patient-doctor relationship.

6.3.3.1 Data collection, processing and cleaning

The draft 32 item version of the questionnaire was pilot between November 2005 and March 2006 at five GP surgeries. The revised 10 item version was administered at two GP surgeries between July and August 2006.

For both rounds of piloting, patients aged 16 years and older who were attending for a doctor's appointment were asked to take part. Patients who said they were unable to self-complete the questionnaire or who were too physically or mentally unwell were excluded. A box was placed in the reception area for respondents to return the questionnaire before leaving the surgery. Patients who wanted to return the questionnaire by post were given a stamped addressed envelope.

During round one, receptionists at four of the five participating practices invited patients to complete the questionnaires. At the fifth practice because of pressure of work, the author sat in reception area and did it himself. For round two, in order to minimise the burden on the practices and to facilitate response rates, an assistant was employed for this task.

All questionnaires were numbered and logged when returned so that response rates between practices could be compared. All qualitative comments were recorded, any patient identifiable data destroyed, and the questionnaires sent for double entry by a professional company (Wyman Dillon). The data were returned in the form of Excel spreadsheets which were imported into STATA for analysis. Range and missing data checks were performed. The original paper questionnaires were reviewed for any responses coded as conflicting responses, i.e. marks in two categories in response to the same question, and where possible these responses were clarified.

6.3.3.2 Analysis

Statistical analysis was performed using Intercooled STATA (StataCorp, versions 8.2 and 9.2).

6.3.3.2.1 Descriptive analysis

For each question item the amount of missing data was examined, the item mean and standard deviations (SDs) calculated, and a histogram of the distribution of responses plotted. Responses were also inspected for low discriminatory power (responses concentrated in one or two categories) and ceiling effect (failure to disclose a range of opinion). The questionnaires were checked for any written remarks, either in the comments box or elsewhere.

6.3.3.2.2 Reliability: internal consistency

Cronbach's alpha statistic was used to assist in the development of scales and selection of items. It is a function of both the average inter-item correlation and the number of items in a scale, and increases as either of these increases. Coefficients above 0.7 are generally regarded as acceptable for psychometric scales, although it is often recommended that values should be above 0.8 (good) or even 0.9 (excellent).[329]

Cronbach's alpha assumes that the scale relates to a single latent variable, and is therefore uni-dimensional. Although it is often assumed that alpha is itself a check for dimensionality, and that a high result implies a uni-dimensional scale, this is incorrect. Results can be high when calculated for multi-dimensional scales.[329] Therefore, dimensionality should always be checked by, for example, factor analysis.

6.3.3.2.3 Validity: exploratory factor analysis

Exploratory factor analysis was performed, which is an important and powerful means of establishing the construct validity of psychometric tests. It provides a formal method of exploring correlation structure and testing the dimensionality of scales.[324] However, it is also a complex procedure with few absolute guidelines and many options.

Essentially, factor analysis consists of a variety of statistical methods whose common objective is to represent a set of variables in terms of a smaller number of hypothetical factors. It is based on the fundamental assumption that underlying factors explain the co-variation among the observed variables.[332] There are many methods of extracting a factor but they all end up with a column of numbers, one for each factor, that represent the "loadings" of the variables on that factor. These loadings represent the extent to which the variables are related to the hypothetical factor.[333]

Principal factor analysis with orthogonal (varimax) rotation was used. The issues that were considered in choosing and employing this technique were:

Which type of factor analysis? There are two factor analytic models: principal components and principal factors. The key characteristic that distinguishes between them is that in principal components all variability in the items is included in the analysis, while principal factors analysis only uses the variability in an item that it has in common with the other items. In most cases these two methods usually yield very similar results, but principal components analysis is often preferred as a method for data reduction, while principal factor analysis is often preferred when the goal of the analysis is to detect structure.[334]

Which type of rotation? The factor structure produced by the initial transformation may be arbitrary and it can be difficult to interpret. Therefore a procedure called rotation is often used. Rotation involves iterations to re-align or re-draw the factor loadings to help produce a more meaningful result.[324] Kim and Mueller[332] and Gorsuch[335] agree that any of the more popular rotation procedures can be expected to lead to the same interpretations. Orthogonal rotations are preferable to oblique rotations however, because they are simpler to understand and interpret.

How many factors? Attaining a simple structure depends on the number of factors that are rotated. Commonly, eigenvalues of greater than one and Cattell's scree test are used to select the correct number of factors. The eigenvalue indicates the amount of standardised variation explained by, and hence the relative importance of, each factor. An eigenvalue of one is equivalent to a single raw variable. The scree test is a graph made of the eigenvalues and the principal factors. The cut-off point for factor rotation is where the line changes slope.[336]

How should the results be interpreted? Tabachnick and Fidell[337] cite 0.32 as a good rule of thumb for the minimum loading of an item, which equates to approximately 10% overlapping variance with the other items in that factor. A "cross-loading" item is an item that loads at 0.32 or higher on two or more factors. Dropping the cross-loading item may be a good choice if there are several adequate to strong loaders (0.50 or better) on each factor. If there are several cross-loaders, the items may be poorly written or the *a priori* factor structure could be flawed. Item communalities are considered "high" if they all have uniqueness <0.20. If an item has a uniqueness >0.60, it may either not be related to the other items, or suggest an additional factor that should be explored.

Of course, there is nothing in the factor analysis methods themselves that can demonstrate that one factor solution is more scientifically useful than another. Neither do they tell us what substantive labels or meaning to attach to the factors. These decisions depend on the careful interpretation of what high loading variables measure.

6.3.3.3 Item reduction

Methodology for shortening questionnaires lacks standardisation and reference books usually do not give any practical recommendations for this process.[338] The two main approaches are based on psychometric methods and expert opinion. The Spearman-Brown formula can be used to anticipate the possible effect of reducing the number of items on internal consistency.

6.3.3.3.1 Psychometric methods

Psychometric methods can be used to guide the process of shortening item scales. They can identify items that: are strongly correlated with other items, and are therefore redundant because they add little information to the other items; and are only weakly correlated with their scale score and therefore perform poorly or make little contribution. Cronbach's alpha can be used to explore the effect of removing item(s) from a multi-item scale: if the alpha reliability remains unchanged after deleting an item, it may be unnecessary.

The most commonly reported approaches to reducing scale length have relied heavily on statistical methods, typically examining correlations of shorter with longer versions in the same data, or using methods to maximise the internal consistency of the shorter version (Cronbach's alpha). However, excessive attention to internal reliability can result in the omission of important items, particularly those that reflect the complexity and diversity of a phenomenon.[328] Factor analysis has often been used, inappropriately according to Coste *et al*[338], to select those items that load highly on rotated factors for inclusion in the short form. Their concern is that under or over-extraction of components leads to "unreliable factor solutions and therefore to an inadequate selection of items."

A balance has to be struck between satisfactory internal consistency and a measure that is too homogeneous because it measures a very restricted aspect of a phenomenon.[328] Properties such as precision may also be jeopardised by an instrument with fewer items.

6.3.3.3.2 Expert-based approach

An expert-based approach also has its limitations, but it is preferable to solely relying on statistical information. The content of the original scale should be carefully analysed to detect areas of redundancy or uselessness and statistical information on individual items (reliability, loading on an important factor, responsiveness) may be used to guide decisions when items seem to be equivalent as to their content importance.[338]

6.3.3.3.3 Spearman-Brown "prophecy formula"

One means of predicting the likely change in correlation, and hence the Cronbach's alpha, from alterations in the scale length is the Spearman-Brown prophecy formula.[325] It is calculated thus:

$$r' = \frac{kr}{1+(k-1)r}$$

where k is the factor by which the scale is to be increased or decreased, and *r* is the original correlation. If individual items in the scale are good estimates of the latent variable in the sense that they estimate it with little error, they will have high correlations and fewer items will be needed in the scale. On the other hand, if the items have much error, many items will be needed.

6.3.3.3.4 Summary

Decisions about changes to the content and length of the questionnaire were made concomitantly. The overall aim was to achieve parsimony whilst retaining the key components of patient-doctor depth of relationship.

Item-by-item, all of the following information was considered: depth of relationship element (knowledge, trust, loyalty or regard), qualitative comments (from the patient interviews, respondents' comments on the questionnaire and collaborator feedback), completion rates, the distribution of responses, the results of the factor analyses and inter-item correlations.

The statistical tools of Cronbach's alpha and exploratory factor analysis helped guide but not dictate the process of shortening the depth of relationship scale. The Spearman-Brown prophecy formula was also used to help predict the effect of reducing the number of items in the scale on its reliability. Care was taken throughout the process to avoid compromising the acceptability of the instrument to patients. It is essential to maintain or improve acceptability in order to obtain high response rates and make the interpretation of results easier, more generalisable and less prone to bias from non-response.

6.3.3.4 Sample size

There is no general agreement about methods of estimating the size of sample required for factor analysis. Small sample sizes may provide insufficient information to enable determination and extraction of more than one or two factors. Very large sample sizes mean even trivial factors can become statistically highly significant, and there can be a tendency to extract too many factors.[329]

Rules of thumb have been recommended by some authors, such as there being more participants than variables (minimum ratio 2:1) and more participants than extracted factors (minimum ratio of 20:1).[336] Unfortunately there is little theoretical basis for most these rules.

Studies have revealed that adequate sample size is partly determined by the nature of the data.[339] Sample size requirements will depend on the between-item covariance matrix and the distribution of responses to the questions, which are generally unknown before the study is carried out. In general, the stronger the data, the smaller the sample can be for an accurate analysis. "Strong data" in factor analysis means uniformly high communalities without cross loadings, plus several variables loading strongly on each factor. In practice these conditions can be rare.[339]

6.4 Results

6.4.1 Pre-pilot results

6.4.1.1 Item generation and selection for pre-pilot questionnaire

It was easier to write or match potential questions for some codes than others, and for this reason the number of alternatives generated varied between one and 15 items per code. However, the mode number of questions per code was six and in total there was an initial pool of 124 items.

Following the principles previously outlined and working iteratively between the depth of relationship synthesis findings and the pool of potential question items, the number of questions was reduced to 56. This was an arbitrary figure, which was thought to represent an appropriate compromise between ensuring that all the issues identified were covered, whilst at the same time being a reasonable length for a first draft of a questionnaire.

6.4.1.2 Patient interviews

21 patients replied to their doctor's invitation to take part in the pre-pilot interviews. Of these, 11 people (five male and six female, age range 33-79 years) took part in ten interviews over a two month period (one was a joint interview with a married couple). Their characteristics are shown in
Table 6-1. All participants were white, and as can be seen the majority were of middle and old age. Interviews took place in patients' homes and lasted between 20 minutes and 1 hour 15 minutes.

Table 6-1 Pre-pilot interviews: participants' characteristics

<table>
<tr><th>Interview no</th><th>Practice ID</th><th>Sex</th><th>Age</th><th>Marital status</th><th>Highest educational qualification</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>1</td><td>F</td><td>57</td><td>Single</td><td>CSEs/equivalent</td></tr>
<tr><td>2</td><td>1</td><td>M</td><td>69</td><td>Married</td><td>CSEs/equivalent</td></tr>
<tr><td>3</td><td>1</td><td>M</td><td>75</td><td>Married</td><td>City & Guild</td></tr>
<tr><td>4</td><td>1</td><td>F</td><td>68</td><td>Married</td><td>RSAs</td></tr>
<tr><td>5</td><td>2</td><td>F</td><td>33</td><td>Married</td><td>CSEs/equivalent</td></tr>
<tr><td>6</td><td>2</td><td>M</td><td>73</td><td>Married</td><td>O levels/equivalent</td></tr>
<tr><td>7</td><td>4</td><td>F</td><td>52</td><td>Married</td><td>O levels/equivalent</td></tr>
<tr><td>8</td><td>3</td><td>M</td><td>48</td><td>Divorced</td><td>Nil formal</td></tr>
<tr><td>9</td><td>4</td><td>F</td><td>46</td><td>Married</td><td>A levels</td></tr>
<tr><td rowspan="2">10 †</td><td rowspan="2">3</td><td>F</td><td>76</td><td rowspan="2">Married</td><td>Nil formal</td></tr>
<tr><td>M</td><td>79</td><td>Nil formal</td></tr>
</table>

†: Joint interview (husband & wife)

The majority of comments about participants' experience of patient-doctor relationships were positive. All of the volunteers described good relations with their current doctor or practice. Most nominated a GP whom they preferred to see, but several patients talked about how such preferences were trumped by the urgency of the problem or the lack of availability of a given doctor. Talk about patient-doctor relationships concentrated on: the doctor's interpersonal skills, their knowledge of the patient and what interest they took in the "whole person"; how much the patient trusted the doctor; and how relaxed they felt consulting with him or her.

In total eight versions of the questionnaire were trialled and more than one version was tried in the course of later interviews. Participants preferred simple questionnaire formats, with the choice of five response options. Confusion with negatively worded statements was common. It was therefore decided to adopt a simple layout with five response options for each question. On the basis of comments on specific items, the following alterations were made: the order of some items was changed; other items were re-worded to improve clarity; and items thought to be too ambiguous or indistinct were eliminated. Although one participant found questions that asked about the doctor's perceptions of them difficult to answer, items of this type of item were retained because the author thought they might tap the reciprocal nature of relationships reported in the literature.

6.4.2 Pilot results

6.4.2.1 Draft questionnaire

The draft patient-doctor depth of relationship questionnaire underwent two rounds of piloting in seven practices. As a result of the findings of the first round, the questionnaire was modified before being piloted again in the second round.

6.4.2.1.1 Selection of depth of relationship items and response categories

After completing the interviews and carrying out the aforementioned revisions, there were 43 questions items. In order to make the questionnaire as user-friendly as possible and to maximise response rates, the number of items in the final draft was further reduced to 32. Items were deleted after further discussion with the project supervisors and reviewing the qualitative literature synthesis and interview findings again.

Four different types of heading for the response categories were used for two reasons. First, because the items selected did not all easily fit into a single response format. And second, to break-up the questionnaire and discourage response sets. Conventional questionnaire design wisdom dictates that response categories should be offered which offer a balance of positive and negative choices. However, all four types of response categories were purposively biased in a positive direction for the following reason. The patient-doctor doctor literature recognises that the majority of patients report satisfaction with their care, which may reflect either genuine contentment or unwillingness to criticise. Consequently negative response options tend to be under-utilised and “ceiling effects” occur, making it difficult to identify different patient experiences. Therefore, in order to try and negate this problem, all response categories were offered as one negative, one neutral plus three positive options.

6.4.2.1.2 Layout

The final draft questionnaire had two sections. The first section, which patients were invited to complete before the consultation, comprised seven questions about the patient's sociodemographic status (age, sex, marital status, ethnic background, accommodation, employment and education). The 32 patient-doctor depth of relationship items were contained in the second section, which was designed to be completed after the consultation. The questions and response scales are shown in Table 11-4 (Appendix 11.2).

6.4.2.2 Pilot round one

6.4.2.2.1 Data collection

Five practices handed-out 505 questionnaires (approximately 100 questionnaires per practice). 381 questionnaires were returned, but two of these were completely blank and four had been incorrectly completed by or on behalf of a patient less than 16 years of age. 375 questionnaires were thus included in the analysis (overall response rate of 74.3%). The characteristics of questionnaire respondents are shown in Table 6-2.

6.4.2.2.2 Qualitative data

Written comments related either to the doctor/practice or the questionnaire itself. Regarding the doctor/practice, remarks were about access issues or the perceived quality of care.

The most frequent criticism of the questionnaire was a difficulty in answering questions with an unfamiliar doctor. Some respondents wanted a means of qualifying their comments according to whether they had seen them before or not. A number of respondents reported that they found it hard to answer some of the questions that asked them to judge the relationship from the doctor's perspective. Although a number of items may require a degree of judgement regarding the doctor's thoughts about the patient, questions such as item 28 ("This doctor's trust in me is …") seemed to cause greatest problems.

Table 6-2 Pilot round one of patient-doctor depth of relationship questionnaire development: characteristics of respondents

	No	% †		No	% †
Age			**Accommodation**		
16-25	56	15.2	Owner-occupier	248	67.9
26-35	49	13.3	Rented/other	117	32.1
36-45	74	20.1			
46-55	61	16.6	**Employment**		
56-65	51	13.9	Employed	196	53.9
66-75	35	9.5	Unemployed	10	2.8
76-85	36	9.8	Retired	83	22.8
86-95	6	1.6	Other	75	20.6
Sex			**Education**		
Male	128	34.8	None	92	26.2
Female	240	65.2	Basic	163	46.4
			Advanced	49	14.0
Ethnicity			Higher	47	13.4
White	351	94.9			
Other	19	5.1			
Marital status					
Single	79	21.3			
Married/living with partner	232	62.5			
Divorced/separated	28	7.6			
Widowed	32	8.6			

† Percentages may not add up to 100 due to rounding

6.4.2.2.3 Quantitative data

88.5% of respondents completed 27 or more depth of relationship items. The individual item completion rate varied from 87.2% (question 28) to 92.3% (question 1). There was no evidence of response fatigue and no differences in completion rates were found between practices or by patient age, sex or education.

Table 11-4 (Appendix 11.2) shows the distribution of responses for each item. For questions 1 to 10, the "poorly" response item was less frequently used. Question 3 was positively skewed (toward "not at all") and questions 13-17, 19, 22, 25, 29 and 30-32 were negatively skewed (toward "totally agree", "excellent" or "definitely"). The response distribution to question 21 has a bimodal appearance. The majority of responses for questions 4, 9 and 10 were in the middle or upper two categories (“well”, “very well” or “extremely well”).

Cronbach’s alpha for all 32 items was calculated and was very high (0.98). Data were examined using exploratory factor analysis as a one, two or three factor solution. The “uniqueness” was higher in items 20, 30, 31 and 32 for all these analyses. The three factor solution appeared to just pick-out different questions by their response categories (“Not at all-Extremely well”, “Disagree-Totally agree”, “Poor-Excellent” and “Definitely not-Definitely”) and the one factor solution increased the uniqueness in all items, especially questions 1 to 3 and 5 to 8.

Although the qualitative synthesis literature described patient-doctor depth of relationship in terms of the four different elements of knowledge, trust, loyalty and regard, exploratory factor analysis of pilot questionnaire data did not support the notion that patients comprehend the depth of relationship in as many dimensions. The majority of the variance in the data (82.0%) could be explained by just one factor, with a second factor accounting for 8.2%.

Adopting a two factor solution (Figure 6-1 and Table 6-3), 18 items (11, 13 to 17, 19, 20, 22 to 29, 31, 32) appeared to group under factor one, and eight items (1 to 3, 5 to 8, 21) had higher loadings under factor two. Factor one question items appeared to concern feelings of connectedness between patient and doctor whereas factor two items seemed to be more factual or knowledge-based. Six items (4, 9, 10, 12, 18, 30) did not definitely fall into either factor.

Figure 6-1 Pilot round one of patient-doctor depth of relationship questionnaire development: scree plot of the exploratory factor analysis

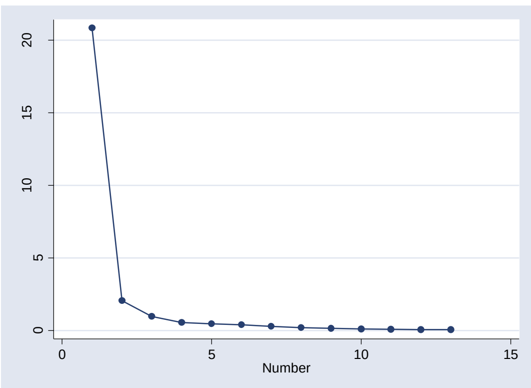


Table 6-3 Pilot round one of patient-doctor depth of relationship questionnaire development: varimax rotated two factor solution using principal factors

Item		Factor		Uniqueness
No	**Text**	**1**	**2**	
1	I know this doctor	0.2871	**0.8348**	0.2206
2	This doctor knows my background	0.3125	**0.8207**	0.2287
3	This doctor knows my home life	0.2148	**0.8412**	0.2462
4	I get on with this doctor	0.6017	0.5327	0.3541
5	This doctor knows me as a person	0.3300	**0.8254**	0.2099
6	This doctor knows what works for me	0.4078	**0.7699**	0.2409
7	This doctor knows how I feel about things	0.3836	**0.7582**	0.2779
8	I know what to expect with this doctor	0.4610	**0.7260**	0.2604
9	This doctor supports me	0.6288	0.5680	0.2821
10	This doctor understands how my problem(s) affect me	0.6123	0.5468	0.3260
11	This doctor really cares for me	**0.7351**	0.3930	0.3053
12	There is a strong bond between me and this doctor	**0.6172**	0.5684	0.2960
13	I can totally depend on this doctor	**0.7229**	0.4474	0.2773
14	This doctor feels completely relaxed with me	**0.7561**	0.3423	0.3112
15	This doctor takes me seriously	**0.7984**	0.2457	0.3022
16	I can be myself with this doctor	**0.8136**	0.2682	0.2661
17	This doctor tries hard to work with me	**0.8003**	0.3406	0.2435
18	This doctor knows exactly what to expect with me	0.5763	0.5993	0.3086
19	I have complete confidence in this doctor	**0.8024**	0.3310	0.2466
20	This doctor accepts me the way I am	**0.7221**	0.3205	0.3759
21	This doctor knows me inside-out	0.4505	**0.6985**	0.3091
22	I feel totally relaxed with this doctor	**0.8237**	0.2834	0.2412
23	My rapport with this doctor is	**0.7604**	0.4154	0.2491
24	This doctor's dedication to my care is	**0.8209**	0.3742	0.1861
25	My trust in this doctor is	**0.8202**	0.3731	0.1880
26	This doctor's respect for me is	**0.8077**	0.3802	0.2030
27	My relationship with this doctor is	**0.7689**	0.4501	0.2062
28	This doctor's trust in me is	**0.7792**	0.3909	0.2401
29	My respect for this doctor is	**0.8030**	0.3515	0.2316
30	If I need to see a doctor, I try to see this one	0.5558	0.4684	0.4717
31	I would forgive this doctor if he/she made a genuine mistake	**0.5158**	0.3351	0.6216
32	I would be very concerned if this doctor left	**0.6246**	0.4821	0.3775

6.4.2.2.4 Questionnaire revisions

To provide a way for patient's to qualify their comments in terms of whether they had seen the index doctor before, an additional question ("Is the doctor you are seeing today your usual or regular doctor?") was added to the first part of the questionnaire.

Calculations using the Spearman-Browne prophecy formula suggested that the total number of items could be reduced by a quarter, with a reduction in Cronbach's alpha from 0.98 to 0.92. Similarly, it appeared that the number of items in the factor sub-scales could be halved without significantly affecting the Cronbach's alpha of these scales. Therefore it was decided to retain 10 items from the original 32 questions, with at least four items in each sub-scale.

Six items (11, 15, 20, 22, 31 and 32) from factor one ("connection") and four items (1, 5, 7 and 8) from factor two ("knowledge") were selected. Item 32 had relatively high cross-loadings, and item 31 had a high uniqueness, but both questions were retained for the second round because of their potential "novelty" value. Item 27 ("My relationship with this doctor is …") had a higher loading on factor one than two, but it was retained as a stand-alone "overall" item.

A single disagree-totally agree response scale was adopted for two reasons. First, the fewer number of items meant that "response sets" was less of a concern. Using different response scales to try and prevent this phenomenon was unwarranted, and it was hoped that having a single scale would make it quicker and easier for respondents to complete. Second, there was a concern that some of the factor analyses findings might be attributable to differences in the response scales of the different questions rather than any underlying dimension. This issue was addressed by adopting a single response scale. However, because of this decision, three items (1, 7 & 27) had to be slightly re-worded. To improve clarity, item 32 was also changed from "I would be very concerned if this doctor left" to "I would be very sorry if this doctor left".

The self-imposed statutory inclusion of paired patient ("I [the patient] think") and doctor ("I [the patient] perceive the doctor thinks") perspective question items, for certain aspects of depth, was abandoned. Questions on the doctor perspective in the 32 item version, retained for this reason, had received negative qualitative feedback and achieved lower rates of completion.

6.4.2.3 Pilot round two

After a questionnaire has been modified, it is good practice to re-pilot it. This second round of piloting also represented an opportunity to see how well the shortened instrument performed in a different patient population. That is, the majority of respondents in the first round were female, middle-aged and white. In order to try and get more men, younger and non-white patients to complete the questionnaire, two practices situated in areas of Bristol that predominantly serve populations of this type were purposefully recruited. Two additional items were also added to the end of the questionnaire. The first asked respondents to rate (very difficult, difficult, easy or very easy) how easy they found it to complete the questionnaire. The second asked whether they completed both parts before seeing the doctor.

However, this second pilot round was foremostly a confirmatory stage to ensure that no new unexpected problems arose from the revisions made to the number, order, wording or response scale of the question items. For this reason, it was administered to a smaller number of patients.

6.4.2.3.1 Data collection

200 questionnaires (100 per practice) were handed-out. 161 questionnaires were returned, but four of these had been completed by patients not seeing a doctor, and a further three had been incorrectly completed by, or on behalf of, a patient less than 16 years of age. 154 questionnaires were therefore included in the analysis (overall response rate of 77.0%, similar to round one).

Table 6-4 Pilot round two of patient-doctor depth of relationship questionnaire development: characteristics of respondents

	No	% †		No	% †
Age			**Accommodation**		
16-25	14	9.2	Owner-occupier	81	54.4
26-35	38	24.8	Rented/other	68	45.6
36-45	33	21.6			
46-55	24	15.7	**Employment**		
56-65	17	11.1	Employed	78	50.7
66-75	20	13.1	Unemployed	3	2.0
76-85	7	4.6	Retired	26	16.9
			Other	47	30.5
Sex					
Male	66	43.1	**Education**		
Female	87	56.9	None	47	32.6
			Basic	76	52.8
Ethnicity			Advanced	14	9.7
White	147	96.1	Higher	7	4.9
Other	6	3.9			
Marital status					
Single	36	23.5			
Married/ living with partner	93	60.8			
Divorced/separated	13	8.5			
Widowed	11	7.2			

† Percentages may not add up to 100 due to rounding

6.4.2.3.2 Qualitative data

No additional information informing the questionnaire's development was obtained. All written comments were about practice and doctor issues.

6.4.2.3.3 Quantitative data

Table 6-4 breaks down the characteristics of questionnaire respondents. More men completed the questionnaire compared with the first round, and respondents were generally younger and had fewer formal qualifications. Ethnicity was similar. The respondents' answers to the depth of relationship items are given in Table 11-5 (Appendix 11.2).

88.3% of respondents completed both parts of the questionnaire. 87.7% of respondents said they found the questionnaire easy or very easy to complete, and 27.9% admitted to completing both parts of the questionnaire before seeing the doctor. Of these, 70.3% said they were seeing their "usual or regular doctor".

134 (87.0%) respondents completed nine or more depth of relationship items. The majority of people who completed fewer than eight items (18 out of 20) only completed the first part of the questionnaire. The completion rates of individual depth of relationship items varied from 86.4% to 88.3%. No differences were found in completion rates by patient age, sex or education.

The distribution of responses for each item was examined (Table 11-5, Appendix 11.2) and was generally satisfactory, although questions 5 to 10 were skewed toward "totally agree". These were compared with round one data, remembering that items 1 to 4 and 9 and 10 had different response categories. The distribution of responses to questions 1 to 4 were more normal, with the problem of "poor" response category removed. The appearance of item 10 was similar, but item nine had a less normal appearance. Item 11 looked more bimodal.

Cronbach's alpha for the ten depth of relationship items was calculated (0.93), which was similar to that predicted using the Spearman-Brown formula and from repeat analysis of the ten selected items with round one data. This figure is obviously lower than round one (0.98) but is still high.

The data were examined using exploratory factor analysis as one and two factor solutions. The "uniqueness" was highest in items nine and ten for both of these analyses. Once again, the majority (85.3%) of the variance in the data was explained by a single factor (factor one), with a second factor accounting for a further 13.9%. Adopting a two factor solution (see the scree plot, Figure 6-2), four "knowledge" items (1 to 4) grouped under factor one, and four "connection" items (5 to 8) had higher loadings on the second factor (Table 6-5). Items 9 and 10 appeared to align themselves with factor two, but question nine retained a high uniqueness and question ten cross-loaded heavily between the two factors.

Figure 6-2 Pilot round two of patient-doctor depth of relationship questionnaire development: scree plot of the exploratory factor analysis

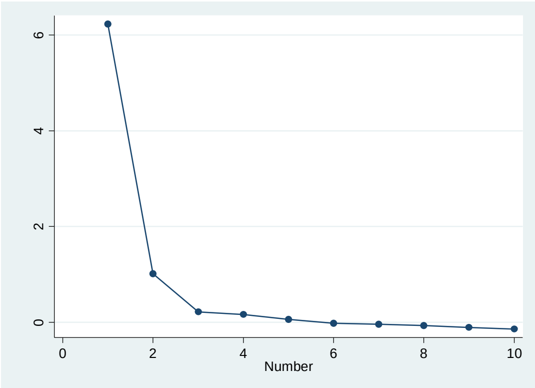


Table 6-5 Pilot round two of patient-doctor depth of relationship questionnaire development: varimax rotated two factor solution using principal factors

Item		Factor		Uniqueness
No	**Text**	**1**	**2**	
1	I know this doctor very well	**0.8678**	0.3029	0.1552
2	This doctor knows me as a person	**0.8924**	0.2513	0.1405
3	This doctor really knows how I feel about things	**0.7941**	0.3571	0.2419
4	I know what to expect with this doctor	**0.8616**	0.3463	0.1377
5	This doctor really cares for me	0.4230	**0.7199**	0.3028
6	This doctor takes me seriously	0.3260	**0.8507**	0.1701
7	This doctor accepts me the way I am	0.3537	**0.7596**	0.2978
8	I feel totally relaxed with this doctor	0.3453	**0.8062**	0.2309
9	I would forgive this doctor if he/she made a genuine mistake	0.1976	0.5037	0.7072
10	I would be very sorry if this doctor left	0.4953	0.6181	0.3726

6.4.2.3.4 Questionnaire revisions

Items 1 to 8 were left unchanged. Item 11 was separated out from the other depth of relationship items and its response scale changed back to the five-point poor-excellent options used in round one: the decision was made after the first pilot round to retain this item as a separate global item but the distribution of responses using this scale in round one was better. Items 9 and 10 were removed for the following reasons.

Overall, because of cross-loading and higher uniqueness, items 9 and 10 did not fit as well with the model as the other questions. They were different in nature to the other items, being "what if" type statements. Item 9 was retained after the first round because it was a novel question that had a good distribution of responses, and mainly loaded onto one factor. However in both rounds its loading was weaker compared with the other items in that factor and it retained a high uniqueness. The concern throughout was that it might say more about the person answering it than the doctor being asked about. Similarly, item 10 was retained after the first round because it was a novel question that had a good distribution of responses. Nonetheless, factor analysis showed a higher uniqueness relative to the other items and cross-loading between the two factors increased between the two rounds of piloting.

6.5 Summary

6.5.1 Pre-pilot and pilot round findings

Participant's comments during the pre-pilot phase informed the initial version of the draft questionnaire piloted in round one. Specifically, the number of items was reduced, there was no negative wording in the questions, and a five-point response scale was used.

The draft questionnaire used in the first pilot round achieved a good response rate (74.3%), and the 32 item depth of relationship items were generally completed well with the majority eliciting a favourable distribution of responses. However, a concern raised at the pre-pilot stage regarding items that asked about the doctor's perceptions of the respondent was reflected in the lower completion rates seen for this type of question. As a consequence, they were deleted. In addition the data also suggested that there was considerable redundancy and that the number of depth of relationship items could be reduced without loss of information. This finding was congruent with the conclusions of the qualitative synthesis where the 20 depth of relationship codes (upon which initial pool of candidate question items were based) were distilled down to just four depth of relationship elements. Factor analysis was used to inform the selection of items to be used in the second round of piloting, which represented an opportunity to assess the performance of the revised questionnaire in a different population.

The findings from second pilot round of the ten item depth of relationship questionnaire were generally consistent with those of the first. In addition, a slightly improved response rate (77.0%) was achieved and there was less variation in completion rates for the depth of relationship items. Although the characteristics of respondents differed from round one in several respects, disappointingly the ethnic mix was similar. Despite introducing a single response format, factor analysis of the depth of relationship items sorted the same questions between two factors, allaying the concern that some of the variance might be just attributable to different response scales. The performance and factor analysis findings on two items led to them being removed.

6.5.2 Patient-doctor depth of relationship questionnaire

The resulting final eight item patient-doctor depth of relationship questionnaire is shown in Figure 6-3. Arguments can be made for treating it as a uni- or bi-dimensional scale.

One the one hand, the factor analysis findings suggested two possible factors, previously described according to the items comprising each scale as "knowledge" (items 1 to 4) and "connection" (items 5 to 8). If these were thought to be measuring significantly different aspects of depth of relationship then separate scores should be calculated and separately reported for these dimensions. On the other hand, the developmental work also demonstrated a noteworthy amount of cross-loading between the factors for most of the items, and the Cronbach's α for all items was high. It is also easier to explore associations with a single overall depth of relationship score. Therefore in the absence of a compelling reason for calculating and reporting depth of relationship as two figures, it was decided that the final questionnaire should be treated as uni-dimensional scale giving a single overall score. Dimensionality was checked again in the main study (8.2.5.3.1).

Figure 6-3 Patient-doctor depth of relationship questionnaire

Thinking about the doctor you have just seen, please answer the following questions as honestly as possible by ticking the box that best fits with your opinion.

	disagree	neither agree nor disagree	slightly agree	mostly agree	totally agree
I **know** this doctor very well	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
This doctor knows me **as a person**	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
This doctor really knows **how I feel** about things	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
I know **what to expect** with this doctor	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
This doctor **really cares** for me	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
This doctor **takes me seriously**	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
This doctor **accepts me** the way I am	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$
I feel **totally relaxed** with this doctor	☐$_0$	☐$_1$	☐$_2$	☐$_3$	☐$_4$

7. Main study: methods

7.1 Introduction

This chapter describes the cross-sectional study that was conducted to meet aim two and test the two study hypotheses (4.4). It begins by describing how practices, GPs and patients were recruited, and goes on to detail how data were collected, processed and analysed. The results are presented in the following chapter.

7.2 Recruitment

The study involved recruiting practices, identifying a GP within that practice who was willing to be the "study GP" for two or more surgeries, and then recruiting their patients who attended during those sessions. This process is summarised in Figure 7-1.

7.2.1 Practice recruitment

The majority of GPs were recruited from the Avon Primary Care Collaborative of research practices. Ideally, to reduce the possible bias, all practices and GPs in the Bristol area would have been eligible for random recruitment. However, for practical reasons this was not done. First, the amount of time available to recruit GPs and collect sufficient data during study surgeries was very limited. The process of randomly selecting, writing to, chasing responses, and then repeating the exercise with another randomly selected GP if the first GP decided not to take part, would have taken too long. Second, despite researchers' best intentions to ensure a random sample of participants, GPs who agree to take part in research are likely to differ from those who do not.[340] Especially in a small exploratory study such as this, the additional effort involved in approaching doctors randomly selected from a list of practices may not have resulted in a final list of participants that different from members of an established research network.

Figure 7-1 Main study: stages, data collected (source and tool) and associated documentation

	Data		
Stage	**Source**	**Tool**	**Documentation**
Recruitment	Practice	Practice manager questionnaire	Practice letter Practice information sheet Practice consent form
↓	GP	GP enrolment questionnaire	GP letter GP information sheet GP consent form
Study surgery: index consultation	Researcher	Reception form	
	Patient	Patient questionnaire	Patient information sheet
↓	GP	Study surgery form	
EMR review	Researcher	Excel spreadsheet	

EMR: electronic medical record

All of the 29 collaborative practices were invited to take part by letter. In addition five other Bristol practices, known to the researcher as being interested in teaching and research, were contacted. The majority of letters were addressed to a GP identified as the research lead for that practice. Most invitees required a telephone call two weeks after sending the letter to discuss the project and get a decision.

7.2.2 GP recruitment

The practice invite letter asked the addressee to identify a GP in the practice who would be willing to participate in the study – often this was done at a practice meeting. All GPs were eligible. The study GP was sent further information, asked to give consent to taking part and complete an enrolment questionnaire (Appendix 11.3.2). It was agreed with the study GP which two surgeries would initially be studied. If at the end of the two surgeries at least ten completed patient questionnaires with consent to access medical records had not been collected, a further study surgery was arranged.

To reduce possible bias, ideally the surgeries would have been randomly chosen. However, because of part-time working and clinical commitments the availability of both study GP and the author were limited. It was therefore decided to try and obtain a spread of morning and afternoon/evening surgeries between the different GPs over all days of the working week. There was no prior reason to suppose that the day or time of the week that the patient attended would be a significant factor for this study.

7.2.2.1 Study surgery inclusion/exclusion criteria

GPs vary in the number of patients they see during the course of a surgery. In order to maximise the number of patients recruited from each session, study surgeries had to comprise predominantly face-to-face appointments. Consultations, and hence the study's findings, might be affected by interruptions and the presence of professional observers, for example medical students.[341] Therefore surgeries during which participating doctors had on-call or teaching commitments were avoided.

7.2.3 Patient recruitment

When a patient arrived at the surgery for their appointment, if they met the patient and consultation inclusion criteria (see below) the receptionists told them that their doctor was taking part in a project looking at patient-doctor relationships and that they were being asked to complete a questionnaire. Interested patients were directed onto a researcher who was present during every study surgery.

In order to obtain some information on the effect of the inclusion/exclusion criteria on the characteristics of the study sample, patient age, sex and eligibility were recorded for every appointment. With the help of the receptionists, this anonymous data was collected by the researcher on the reception form (Appendix 11.3.3).

7.2.3.1 Patient personal inclusion/exclusion criteria

Patients were included if they were 16 years of age or older, were able to self-complete the questionnaire, and had not already taken part in the study. Reasons for not being to complete a questionnaire were language/literacy problems or incapacity (physical and/or mental). Administering the questionnaire to people who were unable to self-complete it and/or translating the questionnaire into other languages would have widened the potential generalisability that these restrictions impose on the findings, but would have required considerable additional resources for proportionately little gain in such a small exploratory study.

7.2.3.2 Patient consultation inclusion/exclusion criteria

Patients who failed to attend or wait for their appointment, or because their consultation was a non-qualifying type (minor surgery including intra-uterine device fittings, blood tests or private medical examinations such as for HGV licensing) were excluded. Patients had to keep the booked appointment in order for the information provided by the second part of the patient questionnaire to be valid. The format of non-qualifying consultations was considered to be too different from routine, “open-ended” visits which were the primary focus of this study.

7.2.3.3 Patient consent

Consent to completing the questionnaire was implicit. That is, it was assumed that patients who took a questionnaire and returned it completed were happy to do so. Patients were asked to give specific signed consent for access to their electronic medical records. Initially, patients were asked to sign a separate form, but in the final version of the questionnaire consent was sought at the end of the patient questionnaire itself (Appendix 11.3.4).

7.3 Data collection

7.3.1 Overview

Most data collection took place during study surgeries when patients and GPs were asked to complete questionnaires. The electronic medical record and appointment system was reviewed for additional information at a later date. All data collection took place between February 2007 and January 2008. With reference to the stated objectives for part two of the thesis (4.4.1 and 4.4.2) data were obtained from the following sources:

- Patient-doctor continuity
    - longitudinal care: electronic medical record review (7.3.4.2)
    - depth of relationship: depth of relationship questionnaire (7.4.2)
- Patient sociodemographic and health characteristics (7.3.2.1)
- Consultation characteristics
    - doctor's communication skills: GPAQ communication scale (7.4.4)
    - consultation length (7.3.3)
- Patient psychological distress:
    - validated measure: GHQ-12 (7.4.3.1)
    - GP assessment: study surgery form (7.4.3.2)
- patient symptom attribution: patient questionnaire (7.3.2.1)
- previously identified current mental health problem: electronic medical record review (7.3.4.3)
- GP psychological orientation (7.3.2.3)

The subjects, source and different types of measures used in this study are summarised in Table 7-1. The majority of data were therefore obtained from participating patients and doctors. This was done by self-administered questionnaires, the advantages and disadvantages of which have been previously discussed (5.5). However, the primary source of data on longitudinal care and mental health were the patient electronic medical record. The pros and cons of this approach are discussed later (7.3.4.1).

7.3.2 Questionnaires

The two main questionnaire sources of data were the patient questionnaire and the study surgery form used during the study surgeries (Figure 7-1). The principles of questionnaire design were discussed earlier (5.5). Further information specific to these two questionnaires are given below (7.3.2.1 and 7.3.2.2).

Other data collected by questionnaire include information on non-participants (reception form), the practices (practice manager questionnaire) and the study GPs (GP enrolment questionnaire). The GP enrolment questionnaire contained an attitude scale, details of which are given below (7.3.2.3). All the questionnaires are included in the appendix (11.3).

7.3.2.1 Patient questionnaire

7.3.2.1.1 Design

The patient questionnaire (Appendix 11.3.4) came in two parts and was very similar in layout and content to the questionnaire used during the development of the patient-doctor depth of relationship items. Patients were invited to complete the first part which comprised questions about demographics, their consultation and health (including psychological well-being) whilst waiting to see the doctor and asked to complete the second part, which featured questions about the doctor's communication skills and the patient-doctor depth of relationship scale, after their consultation.

Table 7-1 Summary of data collected and assessment measures used

Subject	Source	Tool	Data collected
Practice	Practice manager	Practice manager questionnaire	Practice characteristics: locality, list size, number of doctors (WTE), training status, deprivation payments, lists system, electronic medical record use, doctors at practice (name, sex, GP type, average no clinical sessions per week), nurses at practice (name, sex, nurse type)
GP	GP	GP enrolment questionnaire	GP characteristics: personal (age, sex, ethnicity) and professional (number of years since qualification, number of years at current practice, membership of Royal College of GPs, number of patient contact sessions)
Patients			
Eligible patients	Appointment system	Reception form	Patient characteristics (age & sex) and administrative information (practice patient identifier, eligibility, study patient identifier, questionnaire taken, questionnaire returned/SAE taken)
	Appointment system	Excel spreadsheet	Consultation length
	GP	Study surgery form	Consultation characteristics: discussion of psychological problems, assessment of psychological/emotional disturbance, knowledge of patient
Respondents	Patients	Patient questionnaire	Patient characteristics: personal (sociodemographics: age, sex, ethnicity, marital status, accommodation, employment, education) and health (chronic illness, disability), psychological distress (GHQ-12 score) Consultation characteritstics: seen this doctor before, number of times seen this doctor in 12 months, number of problems, symptom attribution, GPAQ communication scale Patient-doctor relationship: depth, overall rating
Participants	Electronic medical record	Excel spreadsheet	Patient health characteristics: number of repeat prescriptions, number of current psychotropic medicines, current psychiatric disorder, previous psychiatric disorder. Patient longitudinal care: date, consultation type and name of professional (10 consultations/12 months, whichever greater)

The questions about patient's demographic status (items 1.1-1.7) and health (items 3.1 and 3.2) were adopted from the Office of National Statistics Census survey. Items 2.1-2.3 about the consultation were new questions and item 2.4 about the patient's problem attribution were based on the study by Araya.[342] These items were piloted in a draft version of the questionnaire used during the patient-doctor depth of relationship questionnaire development.

Beginning the questionnaire with demographic questions runs contrary to traditional advice on questionnaire design which is to start with questions that relate directly to the topic of research and that will command the subject's interest.[324] The concern is that by starting with questions about demographics, which are comparatively of low interest and can be threatening, may adversely affect response rates. The decision to purposefully begin with these items was made in order to minimise the number of questions the patient had to complete after the consultation. It was the author's experience that GPs often run late and while sitting waiting for their appointment patients are a "captive audience", whereas afterwards they are often keen to leave as soon as possible, especially if their appointment started or ran very late. This phenomenon was observed during pilot work for the patient-doctor depth of relationship questionnaire.

Because of the complex nature of patient psychological well-being, patient-doctor communication and depth of patient-doctor relationship, multi-item scales were used: the 12 item version of the General Health Questionnaire (GHQ-12), General Practice Assessment Questionnaire (GPAQ) communication items and patient-doctor depth of relationship questionnaire respectively. These instruments are discussed later (7.4).

7.3.2.1.2 Administration

All eligible patients were asked to complete and return a copy of the patient questionnaire. A researcher (the author or an employed assistant) was present for the duration of every study surgery and their role was three-fold. First, to check patient eligibility for the study. Second, to answer any questions that patients had about the study. This was particularly important in respect of the request to access medical records. Third, to minimise the number of eligible patients who might be missed by busy reception staff. The author handed-out questionnaires for 27 out of the 68 study surgeries (40.0%).

Patients were encouraged to complete and return the questionnaire before leaving the surgery. If they were unable or unwilling to do this, they were given a stamped addressed envelope for them to return the questionnaire by post. Giving respondents the opportunity to post the questionnaire back gave them more time to reflect on the questions and recall the relevant details, at the risk of producing a lower response rate. Because of concerns about response rates during the early stages of data collection, practices five and onwards were asked to forward on a reminder copy of the patient questionnaire if the original was not returned within one week.

7.3.2.2 Study surgery form

7.3.2.2.1 Design

A ten questions per patient, one patient per page version of the data collection tool was piloted with GP colleagues, who were asked to complete it during routine surgeries, as if they were taking part in the study proper. The feedback given was that it was too complex and demanding. For this reason it was simplified into a format of five questions per patient, one line per patient, eight patients per page (see Appendix 11.3.5).

Information on the choice of questions regarding how much of the time was spent discussing psychological or emotional issues, and how well the GP felt they knew the patient, are given below. Details on GP assessment of patient psychological state follow later (7.4.3.2).

Proportion of consultation time spent discussing psychological or emotional issues. Data on the absolute duration of the consultation in minutes is important, but it does not tell the researcher anything about the content of the visit. Hence the question item “How much of the consultation today was spent discussing psychological or emotional issues?" (None, some, about half, most, all) was included, which was adopted from a study by Armstrong and Earnshaw.[343]

GP global knowledge of patient. Depth of relationship between patient and doctor from the perspective of the doctor has been poorly evaluated. No specific questionnaire has been developed and time constraints mean GPs are likely be reluctant to complete a multi-item scale for every patient during a busy surgery. Neither is there is an agreed method by which doctor knowledge of the patient can be assessed. Previous studies have used a single question item to get doctors to make a global assessment on a Likert-type scale. Hjortdahl[344] used a five point scale (no previous knowledge, slight, some, good, excellent), Gulbrandsen *et al*[345] used a four point scale (some, not at all, good, very good) and Drivsholm *et al*[346] a three point scale (very well, fairly well, not well). In order to gather some data on the relationship from the doctor's perspective, a question designed to broadly capture their knowledge of the patient, based on these examples, was included: "How well do you know this patient?" (Not at all, a little, quite well, well, very well.)

7.3.2.2.2 Administration

The author was present at the start of every study surgery, when he met with the study GP and went through the study surgery form with them, answering any questions or concerns. GPs were asked to answer the three questions after the consultation for all eligible patients aged 16 years or older who they saw during the session, regardless of whether the patient completed a questionnaire. This therefore provided additional data whereby patient respondents and non-respondents could be compared. The study surgery form was collected at the end of the study surgery and checked for missing data.

7.3.2.3 GP enrolment questionnaire

GPs were asked to complete the enrolment questionnaire when they agreed to take part in the study (Appendix 11.3.2). The first part asked about general personal and professional characteristics, such as their age and qualifications. GPs' attitudes toward psychological problems were assessed by means of three items on a sub-scale (items 2.9, 2.10 and 2.13) of the "General practitioners' attitudes towards medical care" questionnaire developed by Cockburn *et al.*[347] This was included in the second part of the GP enrolment questionnaire, along with other items that relate to mutuality (4), communication (3), responsibility for decisions (2) and appropriateness of consultations (2).

Cockburn and colleagues' questionnaire has been used in several studies since its publication,[62;348;349] but an association between GP psychological orientation as measured by the sub-scale and detection of patient psychological distress has not been demonstrated. Nevertheless, in the absence of a more appropriate means of assessing this characteristic, the psychological orientation sub-scale was calculated and used in this study. As directed by the creators of the questionnaire, the subscale score was calculated by adding the raw scores of the component items, allowing reversed scoring for negatively loaded items. A high score indicates a positive attitude toward the dimension.

7.3.3 Appointment system

Computerised appointment systems are used in most GP surgeries. Some practices use the systems that come as part of the main electronic medical record programme whilst others use "bolt on" third party software. Whichever are used, the appointment software commonly tracks the start and end of consultations. There are practical differences in how they are interrogated for this kind of data, but importantly this can be done without reference to the contents of electronic medical records.

This last point matters from an ethical standpoint because after the study surgery, the author compared data recorded on the reception and study surgery forms with the appointment systems. He checked for any missing data and then extracted the consultation length for all patients aged 16 years or older. The accuracy of the duration of consultations is dependent on the GP remembering to record the beginning and end in a consistent manner. GPs were reminded of the importance of this at the start of each study surgery and were asked to mark the start of the appointment when they called the patient in and the end when the patient had left and they had finished recording the visit.

7.3.4 Electronic medical records review

The author reviewed consenting patients' electronic medical records for primarily two reasons. First, to collect data on longitudinal attendance at the practice thereby enabling measures of longitudinal care to be calculated. Second, to identify patients who according to the record have a current mental health problem.

Some previous studies of continuity and GP detection of psychological distress have solely relied on participant self-report for this information. For example, Mainous *et al*[212] calculated the UPC statistic on the basis of patient estimates of how many encounters they had with the health care system in the past year and how many of them were with their regular doctor, and Kessler[268;350] asked participating doctors to say whether the diagnosis of depression/anxiety was new and/or the patient was already on treatment for it. The downside with this approach is that it increases the burden on the respondent and inaccuracies can be introduced because of the reliance on people's memories and telescoping. Telescoping occurs when respondents recall an exposure that occurred outside a defined exposure period, and report them as occurring within the exposure period. Of course, relying on the records means data are only available on patients who give consent to retrieval of this information and as discussed next (7.3.4.1) there are caveats attached to using the electronic medical record for this purpose.

7.3.4.1 Advantages and limitations of using electronic medical records

7.3.4.1.1 Advantages

The use of electronic medical records in general practice in the UK is the norm. All patient contacts with the health professionals should be recorded in them, along with diagnoses including mental health problems. They therefore represent a readily available source of this type of information. The cost of using them is low and data can be extracted relatively quickly.

7.3.4.1.2 Limitations

There may be considerable variation between and within practices in respect of the reliability of electronic medical record data: information may not be available or may not have been recorded; information may not have been entered in a standardised way; and there may be uncertainties and inconsistencies within the record. There are also issues specific to longitudinal care and mental health status.

Problems with longitudinal care data. Assumptions have to be made about the completeness and the accuracy of the consultation data. First, that all patient encounters are recorded in the electronic medical record. Flocke[168] has reported a correlation between patient self-report and their medical record for number of visits in the past year of 0.70. In her study though it was not known which was "correct", that is patients may have over or under-reported. In order to assess the possibility of data being consistently missed because of non-recording or use of paper records, a question about practice policy on this was included in the practice manager questionnaire (item eight, Appendix 11.3.1). Second, although computerised medical records routinely record the date, type and name of healthcare professional consulted for every patient encounter, there is no way of verifying this data. One has to assume that every entry was made on the same date as the consultation, under the correct consultation type (telephone consultation, home visit, etc), and under the healthcare professional's own name.

Problems with mental health status. Summary problem lists on patients' electronic medical records were used to identify current or past mental health problems. The different types of GP computer electronic medical record systems in use commonly allow doctors to record patient problems using the Read code system as current/active or past/dormant items. Some systems also distinguish between significant and minor problems: significant problems are retained in problem lists indefinitely whereas minor problems are automatically removed after a pre-determined time interval. Practice members who use the systems are neither obliged to make sure problems are entered under the correct headings nor change their status from one to the other as problems diminish, resolve or recur. Similarly, unless specifically assigned, current or past significant problems may not appear in summary lists at all. However categorised, there are likely to be inconsistencies in how doctors employ diagnostic codes for mental health problems in patients' notes.

Despite these limitations, the summary problem list still represented a reasonable means of identifying patient psychiatric and psychological problems, current and past. Alternatives would have been to ask patients or doctors, with the associated increase in respondent burden and concerns about the reliability of information collected. However imperfect or inaccurate the summary lists, they are the true working medical records of patients in this study and data collected this way reflects what information a doctor seeing the patient for the first time would have. Collecting this information means its possible influence can be adjusted for in later analyses, so that GPs' assessments reflect the state of the patient at the index consultation.

7.3.4.2 Longitudinal care data

Longitudinal care data was collected for the purpose of calculating longitudinal care indices (7.4.1). As highlighted in the recent discussion paper by Salisbury *et al*[120] decisions have to be made about how the data is collected, which professionals and consultations should be included and what time period should be covered.

7.3.4.2.1 Method and type of data extracted

Data were collected by individually examining patients' electronic medical records and manually transcribing the following information into an Excel 2003 (Microsoft Corporation) spreadsheet. If an entry in the patients' records met the inclusion criteria (see 7.3.4.2.2), the date, type and name of healthcare professional consulted were extracted.

7.3.4.2.2 Qualifying entries: inclusion/exclusion criteria

Patients are likely to encounter a variety of health care professionals and in a number of ways. Choices have to be made about which professionals and which types of contact to include.[120] For example, should all visits to professionals (primary and secondary care) be included or should estimates of continuity be limited to face-to-face encounters with doctors at the surgery only? This decision changes the denominator of many continuity indices which, depending on one's viewpoint, may lead to under or over-estimates. For the purposes of data collection, only entries relating to direct encounters with core healthcare professionals at the practice were extracted.

Practices and systems vary in the number of labels used for direct encounters, but for the purposes of this study entries were coded as one of five options: DNA (did not attend or arrived too late for appointment), surgery consultation, telephone consultation, home visit, or other (consultation type not recorded e.g. "Place not specified"). Examples of indirect encounters not included were contacts with third parties, for instance pharmacist or family member, and administrative entries (memos, scanned letters, laboratory results).

Core practice healthcare professionals were defined as doctors (principals, assistants, registrars, foundation year two and locums) and practice-based nurses (healthcare assistants, practice nurses and nurse practitioners) who commonly share the electronic medical record in the UK. Practices vary in whether other types of primary care worker, for example health visitors, district nurses and midwives record their patient contacts on the practice system. Only extracting appointments with doctors and practice-based nurses therefore meant consistent longitudinal care data with the nuclear practice were obtained. Entries by core practice staff were identified by either referring to the information provided by the practice manager questionnaire or asking practice staff during data collection sessions. Where the professional's name was not recorded (for example, "Locum A") they were recorded as "Unknown doctor" or "Unknown nurse".

A contact with a healthcare provider outside of the practice, i.e. during out-of-hours, was not recorded. All of the practices in this study used deputising services to provide cover at evenings and weekends. Many staff at the practices worked sessions for these services and thus some patients consulting out-of-hours may have by chance been seen by someone from their own practice.

Extracting longitudinal care data at the above level of detail means the characteristics of patients' attendances at the practice level can be described. For the calculation of the longitudinal care indices the data were further restricted (see 7.4.1.2).

7.3.4.2.3 Amount of data extracted: the continuity defining period

To ensure consistency the number of consultations to be extracted for each participant was pre-determined. The ideal would be to have a complete record of patients' attendances at the practice. However, it was not possible to obtain such a comprehensive record of longitudinal care for two reasons. First, it would have required more time than was available to the author. Second, it would have involved looking at patient's paper as well as electronic medical records. Commonly the only way of identifying which professional was seen in written records is by recognising the hand-writing – a formidable task susceptible to much error. Therefore a balance had to be struck between having as complete a record of longitudinal care as possible and the limited resources available to collect this data. It was decided to limit the amount of data collected to a continuity defining period.

Conventionally the continuity defining period has been expressed in terms of an absolute time period or number of encounters.[120] Specifying a time period – all consultations during the previous three months (September to November) for instance – is a simple approach but has the potential disadvantage of giving an unrepresentative picture. For example, a patient may have seen three different doctors for three different visits during the autumn but prior to that visited only one of these doctors for two appointments between April and August. The alternative approach of specifying the number of encounters avoids the problem given in the example, but data would be collected only over a short time period for patients who, for whatever reason, have had many recent consultations. To try and address these two problems, a third option was adopted for this study: to combine both approaches and specify a minimum time period and a minimum number of consultations.

Information on the date, type and name of clinician were extracted from the electronic medical records of consenting patients for all encounters in the 12 months or ten consultations prior to the index consultation, whichever was greater. As long as the date of each consultation is extracted: the data set can always be redefined in terms of time period (12 months or less) or number of consultations (ten or fewer); and additional information about the frequency with which patients consult is also available. Following this rule, it is immediately apparent from the number of consultations whether the patient had a high (more than ten) number of visits at the practice in the 12 month period prior to the index consultation.

7.3.4.3 Mental health data

Patient were identified as having a "current mental health problem" if there was either a mental health problem included on their current/active problem list or they had a current prescription for a psychotropic medication.

7.3.4.3.1 Psychiatric morbidity data

Current/active and past/dormant problem lists were examined for all participants for any record of the following psychiatric issues: depression (including post-natal depression), anxiety disorder, panic disorder, phobic disorders (including agoraphobia and social phobia), eating disorder, bipolar disorder, schizophrenia, other psychotic disorder, sleep disorder, alcohol misuse, drug misuse (including hypnotic/anxiolytic dependence), self-harm (including parasuicide/overdose) and other (e.g. obsessional neurosis, post-traumatic stress disorder). The number of current/active and past/dormant problems was recorded, and for the more relevant current/active list the type of problems were noted as well.

Problems with two commonly used Read codes were dealt with in the following way. First, "Anxiety with depression", which crosses two categories in the above coding system, was coded as anxiety disorder. Second, the label of "Stress-related problem" was ignored unless it was associated with a psychiatric referral or admission, in which case it was included in the "other" category.

7.3.4.3.2 Prescribed medication

The prescription or medication screen for each patient was examined for the following information: the total number of repeat prescriptions, and the total number and type of current psychotropic medicines.

Repeat prescriptions. Because computer systems differ in how they identify an item as being available for re-issue without seeing a doctor, items were counted as being on repeat prescription if they were either listed as a repeat item and/or they were marked/dated as being available for re-issue. Many items prescribed by GPs are not medical treatments as such, and for this reason the following items were excluded: contraceptives, plasters and sprays, sharps bins, dressings, hosiery, test strips, needles, lancets, metered-dose inhaler (MDI) spacer devices, gluten-free products and build-up drinks. A medicine was counted only once even if it was listed more than once in different doses, for example warfarin in 1 mg, 3 mg and 5 mg tablets.

Psychotropic prescriptions. Any medications in sections 4.1-4.4 of chapter four of the British National Formulary[351] were recorded as psychotropics: hypnotics and/or anxiolytic (excluding alcohol, antihistamines and beta-blockers), drug used in psychosis and related disorder, tricyclic antidepressants (TCAs) and related antidepressants, selective serotonin reuptake inhibitors (SSRIs), other antidepressants and CNS stimulants. A psychotropic medicine was recorded as current if it was either listed as a repeat medication (as above) or it had been issued within one month of the index consultation.

7.4 Main study measures

7.4.1 Longitudinal care indices

7.4.1.1 Choice of measure

The different types of published longitudinal continuity indices were discussed in chapter 2 (2.4.2.1). They vary in their perspective and those that share the same perspective have different mathematical properties. In this study primary and secondary measures of longitudinal care are calculated and reported. The primary measure is the measure deemed to be most appropriate for the study conceptual model (3.2.2) and hypotheses (4.4). The secondary measures provide additional insights into patient-doctor continuity in the study sample, permitting further analysis and exploration of the findings. A summary of the different indices used in this study is given in Table 7-2.

Table 7-2 Longitudinal care indices: summary of different summary measures calculated and presented in this study

Name	Description	Possible values	Notes
Count	Number of consultations with study GP	1 to infinity	Includes index consultation so available for all patients
Proportion	Percentage of doctor consultations with study GP	0% to 100%	Can only be calculated if there was at least one other doctor consultation during the continuity defining period
Known	Previous consultation with study GP during continuity defining period	0 (no) or 1 (yes)	
Sequence	Study GP seen at previous doctor consultation?	0 (no) or 1 (yes)	
Usual provider continuity (UPC) index	Proportion of doctor consultations with the usual (most frequently seen) doctor	0 to 1	

Continuity defining period was defined as qualifying encounters (7.3.4.2.2) in the 12 months or ten consultations prior to the index consultation, whichever was greater (7.3.4.2.3)

7.4.1.1.1 Primary longitudinal care index

The primary index had to measure longitudinal care with respect to the study GP. For this reason, an index for a specified provider was necessary. On the face of it, visit-based indices appear to be suitable because they calculate a score for a given consultation (the study GP in the index consultation in this case). However, using a visit-based measure would expresses patient-study GP longitudinal care as a proportion of doctor visits that are with the study GP. This does not fit with the conceptual model which accepts that patients may build relationships with one or more doctors in parallel: it does not predict that patient Z's depth of their relationship with Doctor A will be diminished if patient Z sees Doctor B as well as Doctor A. Instead, patient-Doctor A relationship is expected to be some function of the number of contacts with Doctor A.

For this reason, the number of consultations with the study GP (consultation count or just *count*) was adopted as the primary index of longitudinal care. It is simple to calculate and easy to interpret, and in the context of this study has strong face validity: regardless of how many visits in total a patient had during a certain time period and how they were divided between different healthcare professionals, the more the patient and study GP have seen one another the more likely one would suppose a depth of relationship to be present. By including the index consultation, *count* is at least one for all patient participants. This gives it an additional advantage over the other secondary longitudinal indices, which can only be calculated if the patient has had at least one previous consultation with a doctor in the continuity defining period. In theory there is no upper limit to its value.

The number of consultations with the doctor is an infrequently used measure of longitudinal care, which probably reflects the fact that there are few studies of longitudinal care-depth of relationship and because research into continuity in general has approached it from a patient-practice perspective, that is how patients' encounters are divided between doctors and nurses. Studies of note are those by Hjortdahl and colleagues[110;126;344;352] and the MaGPIE group.[301] Hjortdahl's publications are based on doctor report of number of consultations within the previous 12 months, whereas the MaGPIE group appear to have used patient records. Time is of course implicit in this index and for this reason these workers refer to their measures as longitudinal care density and frequency of consultation respectively. The time period spanned by the data extracted for the purposes of calculating this index (the continuity defining period, see section 7.3.4.2.3) has implications for both the analysis (7.6.2.1) and interpretation (9.4.1.3.1) of the findings.

7.4.1.1.2 Secondary longitudinal care indices

The decision to use *count* as the primary longitudinal care index could be criticised because it is simplistic and does not provide any information on the broader aspects of continuity, as provided by the other more commonly used indices. The fact that it has been infrequently used limits the comparisons that can be made with previously published work also. Therefore to complement the information provided by the *count* index, and to permit comparisons and further analysis, secondary longitudinal care indices were selected and where appropriate utilised.

Like the primary index of longitudinal care, the secondary longitudinal care indices had to relate to the study GP. The below indices were chosen with the accompanying explanations. Proportion, known and sequence are all technically visit-based measures[122] but because the index visit in this study is with the study GP they are also individual measure of patient continuity with this doctor. As already pointed out, to be calculated (unlike *count*) they all require at least one previous doctor consultation.

- Proportion of doctor consultations with study GP (consultation proportion or just *proportion*). Also known in the literature as the fraction of care continuity index (f), in Jee and Cabana's[121] classification of continuity measures it is a dispersion measure. It represents continuity at a patient-practice level, and can be presented as a fraction between zero and one or as a percentage. It is calculated thus:

$$\text{Proportion} = \frac{\text{Number of encounters with study GP in the continuity defining period}}{\text{Total number of doctor encounters in the continuity defining period}}$$

- Known provider continuity (*known*). This a binary measure, also referred to as k, which reflects whether the patient and doctor have ever (one, *known*) or never (zero, *unknown*) met before. In effect, it is consultation *count* dichotomised on a threshold of 1/2. It provides a simple way of exploring associations with any prior encounter with the study GP.

- Sequential continuity (*sequence*). Another binary measure, abbreviated in the literature to s, which equals one (yes) if the provider of the index visit, in this case the study GP, was seen at the preceding doctor visit and zero (no) otherwise. It provides a very simple way of examining for levels and effects of immediate sequential encounters.

- Usual provider continuity (UPC). UPC is calculated in the same way as the *proportion* measure above, except the numerator is the number of encounters with the patient's "usual doctor". Usual doctor can be defined in various ways, but in this study it was taken to be the GP with whom the patient had the most encounters during the continuity defining period. Where patients had had the same number of encounters with one or more doctors, if one of the doctors was the study GP then they were assumed to be the usual doctor, otherwise the most recently seen doctor was nominated.

7.4.1.2 Longitudinal care data inclusion/exclusion criteria

In the absence of any consensus in the literature,[120] decisions had to be made about which consultations and which healthcare professionals should be included in the calculations of the above indices. As this was an exploration of patient-doctor continuity all encounters with nurses and DNA entries were excluded. It was decided that the different consultation types (surgery, telephone, home visit, or "other") should be regarded equally and they were therefore all included. A schematic summary of how longitudinal care data for each patient were processed and analysed is presented in Figure 7-2.

7.4.2 Patient-doctor depth of relationship

7.4.2.1 Choice of questionnaire

As has been previously discussed, published patient-doctor relationship questionnaires mainly focus on interpersonal skills or on individual depth of relationship characteristics, such as trust. The eight item patient-doctor depth of relationship questionnaire, whose development was described in the previous chapter, was purposefully developed within the conceptual framework adopted for this study to provide a global measure of depth of patient-doctor relationship. The global rating item ("My relationship with this doctor is … poor/fair/good/very good/excellent") was also included.

Figure 7-2 Schematic example for one participant of how longitudinal care data were collected, analysed and reported

Original "raw" longitudinal care data

Cons no	Date	Type	Prof
1 (Index)	26 10 06	Surgery	Dr A (Study GP)
2	26 08 08	Telephone	Dr B
3	23 08 08	Surgery	Nurse A
4	05 08 07	Surgery	Dr A
5	24 06 06	Surgery	Nurse B
6	06 06 06	Home visit	Dr B
7	02 04 06	Surgery	Dr C
8	11 03 05	Surgery	Nurse A
9	04 02 05	Telephone	Dr B
10	07 01 05	DNA	Dr A

→

1. Calculate time spanned by continuity defining period (656 days)

2. Remove entries for "Did Not Attends" (DNAs)

3. Calculate number of doctor (5) and nurse (4) consultations

4. Remove nurse consultations

→

Longitudinal care data restricted to doctor encounters

Dr cons no	Date	Type	Prof
1 (Index)	26 10 06	Surgery	Study GP
2	26 08 08	Telephone	Other GP (B)
3	05 08 07	Surgery	Study GP
4	06 06 06	Home visit	Other GP (B)
5	02 04 06	Surgery	Other GP (C)
6	04 02 05	Telephone	Other GP (B)

→

Calculate longitudinal care indices *count* (2), *proportion* (33.3%), *known* (1), *sequence* (0) and UPC (50.0%)

7.4.2.2 Method of scoring

A scale score calculation formula similar to that for the GPAQ communication items was used (7.4.4.1.2) giving a figure of between zero and 32.

$$\text{Depth of relationship scale score} = \frac{\text{mean score of completed questions}}{\text{maximum question range (4)}} \times 32$$

It was decided that a depth of relationship score could be calculated as long as at least six question items had been completed, which is slightly more stringent than for the GPAQ communication scale. This was an arbitrary decision made to try and make as much use of the available data as possible without potentially compromising the validity of the summary measure.

7.4.3 Psychological well-being

Patient psychological distress can be assessed in a number of different ways. Previous studies have assessed: patient distress using self-administered screening questionnaires or disorder-specific scales, or interview or computer-administered schedules designed to detect well-defined psychological problems; doctors' identification of emotional distress by case note review, rating scales completed at consultations, or from physician interviews. Deciding which method to use therefore partly depends on whether comparisons are to be made at the level of specific diagnoses or broader psychological complaints.

As discussed previously, GPs encounter a wide range of psychological and emotional problems (3.3.1.1). There is an "unbroken continuum between states of normality and mood disorder"[353] so that for many manifestations of psychological illness that present in general practice it is inappropriate to compare GP assessments with psychiatric diagnostic categories.[354] Thus, it was decided in this study to compare assessments of general psychological or emotional disturbance.

7.4.3.1 "Gold standard": General Health Questionnaire

7.4.3.1.1 Choice of questionnaire

There are numerous scales of psychological well-being, especially those aimed at specifically detecting common psychiatric disorders such as anxiety and depression.[355] The General Health Questionnaire (GHQ) is amongst the most widely applied self-completion measure of psychiatric disturbance in the UK. It was designed for use in community settings and has been used extensively in primary care studies.[225]

The GHQ is a "screening test" not a diagnostic instrument and as such provides a measure of psychological well-being or distress.[356] It focuses on breaks in normal functioning and is concerned with a person's inability to continue with normal "healthy" functions and the experience of new phenomena of a distressing nature.[356] The GHQ has been criticised for being sensitive to physical illness, yielding false positives,[357] and for missing long standing disorders, especially chronic anxiety disorders, yielding false negatives.[357-359] Recognition of the high rate of false positive results and low positive predictive value have led to suggestions that it be combined with other instruments.[360] However, the GHQ has been compared with other scales and appears to correlate highly with both measures of well-being and measures of distress.[361]

7.4.3.1.2 Choice of GHQ version

There are 60, 30, 28 and 12 item versions of the GHQ. The 12 item version (hereafter referred to as GHQ) was used on the grounds of brevity, ease of completion and because its questions focus on mental health. The items have a similar answering format (for example 0=not much, 1=no more than usual, 2=more than usual, 3=much more than usual) and it takes only two minutes to complete. There is little difference in sensitivity and specificity between the 12 item and the longer versions and it has also been validated in studies in British primary care.[362;363]

7.4.3.1.3 Method of scoring

Patients' total "GHQ score" can be calculated by the Likert or "01" methods. The Likert method sums the individual scores of each item, whereas the "01" method divides the responses to individual items into two categories with scores of 0 or 1 and then sums that total together, to give a score of 0-12. The advantage of the latter method is that it eliminates any errors due to end and middle users (they will score the same irrespective of whether they tend to prefer columns 1 and 4 or columns 2 and 3) and reduces the bias associated with bimodal response scales. The main disadvantage is the loss of information, which does not appear to be important in respect of identifying cases.[356] The "01" method was therefore used in this study.

The GHQ user's manual does not give specific advice on how to treat missing responses. Options are: to assign a score to the missing item that is the mean of the person's completed items; to omit the item and base the total score on the items that were completed; or to not calculate a score.[325] On the basis that neither of the first two options assumptions can be tested, it was decided to only calculate a score when all 12 items had been completed. This avoids any problems consequent of scores calculated on imputed or partially completed scales, but has the effect of reducing the size of the sample available for analysis.

7.4.3.1.4 GHQ caseness

For the main analyses (7.6.2.2.1) data were restricted to psychologically distressed patients (GHQ cases) only. Clearly when the GHQ is used as a screening instrument in a study of GP detection, the score at which a patient is considered a case is important. Unfortunately, there is no consensus on what this should be.

The most commonly used threshold score is 2/3,[364] a level which is supported by the findings of Bashir *et al.*[362] In their validation study conducted six general practices in London, Bashir and colleagues compared the GHQ with PROQSY, a computerised version of the Clinical Interview Schedule. They used receiver operator curve (ROC) analysis, which provides as a summary measure of the ability of the instrument to discriminate between cases and non-cases. Sensitivity is plotted against false-positive rate for all possible cut-off points of a screening instrument and the area under the curve calculated: a value of 0.5 indicates that the ability of the test to discriminate is no better than chance; a value of 1.0 indicates a test with perfect discrimination.[365] They found the optimal GHQ threshold was 2/3 (sensitivity 76.0%, specificity 74.0%, PPV 76.0%), giving an area under the ROC curve of 0.83. However, in a similar international study, Goldberg *et al*[363]compared the GHQ with the primary care version of Composite International Diagnostic Instrument (CIDI-PC) and found the optimal threshold in Manchester was 3/4 (sensitivity 84.6%, specificity 89.3%, PPV 71.4%), giving an area under the ROC curve of 0.95.

It was therefore decided to adopt a GHQ case threshold of 2/3 for the primary analysis, but in combination with alternative threshold for GP caseness (7.4.3.2.2) to perform a secondary exploratory analysis using a threshold of 3/4.

7.4.3.2 GP assessment of psychological/emotional state

It was decided that a post-consultation rating scale was the most appropriate means of obtaining GP opinion of patients' psychological/emotional state. There was no advantage in interviewing the participating doctors, and this approach was likely to be more accurate than relying on medical note review: clinicians may recognise more symptoms than they necessarily record in patients' medical records and they may sometimes intentionally misdiagnose patients in whom they recognize depression.[274]

Previous studies of detection have used a variety means of asking the GP for their assessment of the patient's psychological state. Kessler[350] simply asked GPs to indicate presence/absence of depression or anxiety. More commonly studies have asked doctors to rate the severity of either psychological disturbance or depression on a scale, ranging from none through to severe. They are variations of the five point "psychiatric severity rating" (no psychiatric disturbance detected, mild subclinical emotional disturbance, and clinically significant psychiatric illness – mild, moderate or marked) first used by Goldberg and Blackwell in 1970.[228] These are later dichotomised to indicate whether the GP thought a "significant" disturbance was present.

7.4.3.2.1 Choice of question item

The question "Do you think this patient is suffering from a psychological or emotional disturbance?" was so worded because it was felt to most accurately reflect what the GP was being compared against, that is what the GHQ is measuring. A four point response scale of none, mild, moderate or severe was used because a subclinical option did not appear to provide any additional information in prior studies, and the assessments were to be dichotomised for analysis anyway (see below).

In order to try and provide the doctors with a common reference point for their assessments, guidance for doctors on how to complete the severity of psychological disturbance item was also added to the bottom of every page (Figure 7-3).

7.4.3.2.2 GP caseness

Like patients' GHQ scores, for the purposes of analysing GP detection of psychologically distressed patients (7.6.2.2.1), doctor assessments were dichotomised into cases and non-cases. Earlier studies that used a five-point assessment scale with a "subclinical" category classified patients with "No or subclinical" distress as non-cases and those with "Mild, moderate or severe" distress as cases.[269;366] A lower cut-off point for a detected case increases the proportion of GP cases detected (sensitivity) but reduces specificity. It has been argued that including cases of mild severity might be justifiable given the potential impact of these symptoms (3.3.1.3) and "gold standard" assessment methods usually include mild cases as well. Setting the threshold of GP caseness as mild distress for the primary analysis also means all clinical cases are included and sensitivity of all GPs is maximised, remembering GP detection of distress is the main focus of this study.

Figure 7-3 Rider added to bottom of study surgery form to guide GP on completion of patient psychological/emotional assessment scale

Severity of psychological or emotional disturbance guide	None	Completely normal, patient not disturbed
	Mild	Some symptoms but not amounting to illness
	Moderate or severe	Clinically significant moderate or severe psychological or emotional disturbance

However, adopting a comparable none/mild threshold for GP caseness on the four point scale used in this study may have implications for the research findings. Patients who would have been previously assessed by doctors on a five point scale as having a subclinical level of distress case will now be classified as suffering from none or mild distress. Consequently, whereas all patients with "subclinical" distress were treated as GP non-cases, using a none/mild threshold for GP caseness these individuals may now be classified as a GP case. In addition, in a sample where the threshold for GP caseness means doctor sensitivity is high independent of the variable of interest (i.e. depth of relationship), it may be than an effect for that factor is not seen.

It was therefore decided to use GP case threshold of none/mild for the primary analysis, but in combination with alternative threshold for GHQ caseness (7.4.3.1.4) to perform a secondary exploratory analysis using a threshold of mild/moderate.

7.4.4 Patient-doctor communication

7.4.4.1.1 Choice of questionnaire

It was decided to use an existing questionnaire to assess patient-doctor communication because there are many ready-developed measures available. However, the instrument had to fit a number of criteria: suitable for use in a primary care population and preferably validated for use in the UK; specific to the actions or behaviour of the doctor at the index consultation; and not overlap with the patient-doctor depth of relationship items (i.e. require no modification). Because it was to comprise one part of a larger questionnaire, it also needed to be short.

Candidate questionnaires were: Consultation and Relational Empathy (CARE),[367] Physicians' Humanistic Behaviour Questionnaire (PHBQ),[368] Doctors' Interpersonal Skills Questionnaire (DISQ)/Improving Practice Questionnaire (IPQ),[369] Patient-Doctor Interaction Scale (PDIS),[370] Medical Outcome Study (MOS-9),[371] Medical Interview Satisfaction Scale – UK version (MISS-21),[372] and the communication sections of the General Practice Assessment Survey (GPAS)[373] and the General Practice Assessment Questionnaire (GPAQ).[374]

The eight item communication scale from GPAQ was chosen because it fitted most closely with the above criteria. The GPAQ is a product of extensive work in the UK with an earlier version, the General Practice Assessment Survey (GPAS),[373] which in turn was based upon the widely validated US version, the Primary Care Assessment Survey (PCAS).[374] In addition, it is one of two instruments that have been widely used in the UK in annual practice surveys. The question items are therefore familiar to patients and doctors, and there are published national benchmark data against which findings can be compared.[375] GPAQ has been criticised for lacking published data on reliability and validity,[376] a charge rebutted by its developers[377] and further information on its development and psychometric characteristics has been subsequently published.[378]

7.4.4.1.2 Method of scoring

The GPAQ manual[374] provides detailed information on scale calculation (where zero is the lowest possible score and 100 is the highest possible score). Researchers are instructed to treat any response in the "Does not apply" column as missing and it permits investigators to calculate a communication score even if there are missing responses, as long as four of the eight items have been completed, by using the following formula:

$$\text{Scale score} = \frac{\text{(mean score of completed questions - lowest possible question value)}}{\text{(maximum question range)}} \times 100$$

where the lowest possible question value is one, and the maximum question range is five.

7.5 Data processing

7.5.1 Unique identifiers

All GPs, study surgeries and eligible patients were assigned unique identifiers: GP identifier, surgery identifier and study patient identifier respectively. In addition, all named doctors and nurses identified either by practice managers on their practice manager questionnaire or during longitudinal care data collection were given unique professional identifiers.

GP identifiers and surgery identifiers were assigned before each study surgery. Study patient identifiers were assigned during the course of the session. All eligible patients were given a study patient identifier regardless of whether they completed a questionnaire or not.

Practice computer systems identify patients by a practice patient identifier but because data were collected from several practices this number could not be relied upon to uniquely identify patients in the study. By linking each study patient identifier to their practice patient identifier, it was possible to correctly identify each patient for review of their electronic medical record.

7.5.2 Quality control

A number of procedures were undertaken to maximise consistency in data collection across practices. Researchers who helped administer the questionnaire were given written guidance and briefed and debriefed by the author for each session. The author was also present at the start of every study surgery to speak to the reception staff and the study GP.

GP study surgery forms were checked as soon as possible after each study and the study GP asked to fill-in any missing data. Similarly, the practice manager or GP were contacted if any data were missing on their respective enrolment questionnaires.

The reception form was compared with the practice appointment record to ensure that it was a true and accurate record of all attendees for each study surgery, and that the study patient identifiers were linked with the correct practice patient identifiers. Cross-checks were also performed in respect of the following: that the study patient identifiers and surgery identifiers corresponded with the correct GP identifiers; and that the health care professional identifiers corresponded with the correct GP identifiers. To ensure consistency during the electronic medical record review a codebook was maintained.

Finally, data were examined for consistency where duplicate data were available (e.g. patient age and sex from patient questionnaires and reception forms). Range checks were performed and all data were scrutinised for missing values.

7.5.3 Data entry

Patient questionnaires were double-entered by a specialist data entry firm (Wyman Dillon) and supplied in Excel spreadsheets. The author manually transcribed into Excel spreadsheets data from: practice manager and GP enrolment questionnaires; study surgery forms; and patients' electronic medical records. All data were imported into STATA and merged into a single data file for analysis.

7.5.4 Categorisation and recoding

For presentational and/or analytical reasons, categorical versions of some continuous data were created. Some categorical data were merged for the same reasons or because of few data points in initial categories which posed problems for later logistic regression analysis. Table 11-2 and Table 11-3 (Appendix 11.1) summarise the changes made.

7.5.5 Problem data

7.5.5.1 Missing data

How missing data were dealt with depended on the type of data involved. In respect of scale score calculation of GHQ, GPAQ communication and patient-doctor depth of relationship instruments, it depended on how many items were missing (see sections 7.4.3.1.3, 7.4.4.1.2 and 0 respectively). For multivariate analyses, data missing on a covariate entered into the model meant that patient was discounted from the analysis.

7.5.5.2 Inconsistent data

Where patient age and sex data from patient questionnaire and reception form did not match, patient questionnaire data were used. The GPAQ manual[374] provides some guidance on what to do when respondents tick more than one response on the communication scale:

- Where two responses are adjacent (for example "good" and "very good") code the response that gives the least favourable report
- Where the two responses are not adjacent (for example a respondent checks both "good" and "poor") record the question as missing

These rules were followed and also applied to the patient-doctor depth of relationship items.

7.6 Analysis

Analysis was undertaken using Intercooled STATA (versions 9.2 and 10.1, Statacorp).

7.6.1 Overall strategy

In order to test the study hypotheses, univariable and then multivariable logistic regression analyses were performed.

7.6.1.1 Univariable descriptive or exploratory analysis

For all study variables basic frequency distributions were plotted, and summary statistics and measures of dispersion calculated: mean and standard deviation (SD) or median and interquartile range (IQR) as appropriate. Preliminary analyses were then undertaken to examine for associations between dependent and independent variables, and to identify possible confounding variables.

First, all categorical variables were cross-tabulated against the explanatory variable and chi-squared tests were calculated for each cross-tabulation to look for evidence of an association between dependent and independent variables. A similar analysis for continuous variables was carried out using categorised versions of the variables. Contingency tables were checked for zero cells, which yield an estimate of an odds ratio of either zero or infinity and causes problem in logistic regression analysis. Strategies for handling the zero cell include: collapsing the categories of the independent variable in some sensible fashion to eliminate the zero cell; eliminating the category completely; or, if the variable is ordinal scaled, modelling the variable as if it were continuous.[379] Where required, the first option was employed.

Next the crude odd ratios with their 95% confidence intervals were calculated for categorical and continuous independent variables, so that logistic regression modelling could subsequently adjust these ratios and allow comparisons. All odds ratios were adjusted using robust standard errors to account for clustering by GP.

7.6.1.2 Multivariable logistic regression analysis

Multivariable analysis is a statistical tool for determining the unique contribution of various factors to a single event or outcome.[380] In multivariable analysis, the effect of individual variables on outcome are assessed by fitting a model to the data and estimating a regression coefficient for each variable having adjusted for all other variables in the model. Logistic regression is a type of multivariable analysis used when the outcome is binary or dichotomous.

Logistic regression models the association between binary outcome and exposure variables in terms of odds ratios. The general form of the logistic regression model is similar to multiple linear regression except that a transformation (the log odds of the outcome) of the outcome variable is modelled:

$$\text{log odds of outcome} = ß_0 + ß_1x_1 + ß_2x_2 \ldots + ß_px_p$$

where x_1 to x_p are the exposure variables, $ß_1$ to $ß_p$ are their regression coefficients, and $ß_0$ is the value of the outcome when the exposure variables are zero. Because models are fitted on a log scale the coefficients have a special meaning: the antilogarithm of the coefficient equals the odds ratio.

The transformation of the probability of the outcome into (natural) log odds is known as the logit function.[365] Whereas the logit can taken on any value from minus to plus infinity, the probability, which is the inverse of the logit, can only take on values of zero to one. This gives the logistic function an S or Z shape.[381] A further consequence is that the odds ratio for the effect of multiple variables on outcome is multiplicative rather than additive. In statistics this is referred to as "additive on a multiplicative scale".[381]

Like other methods, the logistic regression model is fitted using the maximum likelihood approach.[365] Estimates are derived by starting with a guess of the parameter estimates, then using the result to compute a better guess (in order to maximise likelihood estimates). The procedure stops when there is no further increase in the log likelihood.

7.6.1.2.1 Model assumptions and limitations

Logistic regression is a mathematical model. If the model does not fit the data, our understanding of the data will be distorted.[380] For example, biased coefficient estimates or very large standard errors for the logistic regression coefficients may arise and these problems may lead to invalid statistical inferences.

Logistic regression models the probability of an outcome and how that probability changes with a change in the explanatory variables. Assuming that all the relevant variables that should be in the model have been included and any unnecessary ones excluded, the model must meet the following criteria for findings of the analysis to be valid:[381]

- each one-unit increase in an explanatory variable multiplies the odds of the outcome by a certain factor (the odds ratio of the predictor) and that the effect of several variables is the multiplicative product of their individual effects
- the distribution of the outcome is binomial (i.e. the outcomes are not clustered)
- the variance of the outcome variable depends only on the mean.

Quadratic terms can be used to introduce non-linearity to the model and the null hypothesis that the exposure effect is linear tested by comparing a non-linear model with the model that assumes a linear effect.[365] Data in this study are clustered by GP and ways of accounting for this are discussed below (7.6.1.3).

The interpretation of the results from even simple logistic regression can be difficult and the coefficient and the resulting odds ratio entirely dependent on the units being used. For multivariable models to adequately adjust for confounding there must be sufficient overlap of confounders in the different groups or outcomes.[381] However, because of measurement error in both dependent and independent variables no multivariable technique can completely adjust for confounding. Other sources of error include the omission or incorrect specification of significant covariates, and failure to account for effect modification (see 7.6.1.2.3 for an explanation).[381]

7.6.1.2.2 Dependent or outcome variable

Logistic regression not only assumes that the dependent variable is dichotomous but also that it is coded as a binary zero or one. Conventionally, zero indicates that the event did not occur and one indicates that it did.

7.6.1.2.3 Selection of independent or explanatory variables

Independent variables that should be included in logistic regression models are variables of specific interest or covariates that may act as confounders and/or effect modifiers. Variables that are extraneous, redundant, have a lot of missing data, or intervene between the risk factor and outcome should be excluded.[381]

A model with fewer variables in it is likely to be numerically stable and is more easily generalisable.[379] The use of automatic variable selection algorithms can reduce the number of variables in a model but they have important limitations and for this reason statisticians strongly discourage their use for any purpose other than as an exploratory tool.[380]

Confounding variables. Confounding variables must be identified and adjusted for in multivariable analysis because they can positively or negatively effect an apparent association between an independent and dependent variable. For a variable to be a confounder it must be associated with the independent and causally related to the dependent variables. Candidate confounder(s) can be entered as an independent variable(s) into the model and the effect on the value of the odd ratios examined. Although one can theoretically distinguish independent associations from confounding, a variable may have both an independent effect on outcome and be a confounder of another variable's relationship to outcome.

Ideally all variables that have been theorized or shown in prior research to be confounders should be included in the multivariable analysis. The association of independent variables with the main explanatory variable and/or outcome in univariable analysis is commonly used to justify a variable being included as a potential confounder, but there is no agreement on how strong the association should be to In general most investigators err on the side of inclusion, including any variables with a p value of less than 0.25 and/or that are theoretically important or have been confounders in prior research.[381] The rationale for this approach is to provide as complete control of confounding as possible within the given data set. This is based on the fact that it is possible for individual variables not to exhibit strong confounding, but when taken collectively, considerable confounding can be present in the data.[381]

The major problem with this approach is that the model may be "overfitted", producing numerically unstable estimates.[379] There is no test for whether a variable is a confounder or an intervening variable and being over-inclusive by entering variables which sit on the causal pathway between the exposure and the outcome may adjust away an effect.

Effect-modifiers. Effect modification is also known as interaction and heterogeneity of odds ratios. Effect modifiers are variables which change the association of an explanatory variable with an outcome; the value of the third variable changes the effect of the risk on an outcome.[365] Interaction is different from confounding because the relationship between the risk factor and the outcome is dependent on, rather than caused by, the value of a third variable.

The most common method of incorporating an interaction in a multivariable model is to create a variable whose value is the product of two independent variables. This product term is then entered into the model. Because a product term describes the relationship between two explanatory factors and an outcome, it can only be interpreted as an interaction if the two independent variables are in the model.

However, interactions can be hard to detect. Care needs to be taken when data are examined for them because such explorations are essentially a form of sub-group analysis. The more interactions searched for, the greater the possibility that the relationship between the dependent variable and the outcome will differ because of chance in one or more of the different subgroups.[380] Statistically significant interactions may be difficult to interpret clinically. For these reasons, tests for interactions should only be performed as a specified prior hypothesis when the effect modifiers are theoretically important.

7.6.1.2.4 Type of independent or explanatory variables

Interval and dichotomous explanatory variables can be entered directly into logistic regression. A discrete increase (or decrease) anywhere along the scale of an independent variables left in their interval form is assumed to have an equal effect on the outcome. Explanatory variables which are categorical (ordinal or nominal) require special consideration.

To be included in a logistic regression model, categorical explanatory variables must first be transformed using dummy or indicator variables. A reference or baseline category is chosen, and a set of indicator variables (which take the value of zero or one) are created that represent each non-baseline value of the exposure variable. The odds are then estimated for each non-baseline compared to the baseline. The regression coefficients for these indicators variables are the corresponding (log) odds ratios. STATA automatically creates indicator variables when the original variable is declared as categorical.[365] The choice of reference group makes a difference to how results are reported and a small difference in the results themselves. Commonly investigators choose the reference category based on the hypothesis being tested. Making the largest group the baseline category produces more precise estimates: the standard errors will be slightly smaller and the confidence intervals will be narrower.[381]

The best way to group a nominal categorical explanatory variable will depend on the research question, the distribution of the nominal variable (how many people are in each group) and the relationship between the different categories of the nominal variable and the outcome. If a group represents less than 5% of the total sample, creating a variable for that group may not carry much statistically important information.[381]

7.6.1.2.5 Hypothesis testing

Hypothesis testing is used in logistic regression to test the null hypotheses, for instance that there is no association between an exposure variable and the outcome or that an exposure effect is linear, by comparing different models. It can be carried out using either Wald tests or likelihood ratio tests. Even though the likelihood ratio (LR) and Wald tests are asymptotically equivalent, in finite samples they give different answers, particularly for small samples.[382] In general, it is unclear which test is to be preferred but Kirkwood and Sterne[365] favour likelihood ratio tests for the following reasons:

- the lack of dependence of the likelihood ratio statistic on the scale used for the parameter(s) of interest
- the ease with which the calculation and interpretation of likelihood ratio statistics can be carried out in more complex situations
- in contrast, although Wald tests are directly interpretable for exposure variables which are represented by a single parameter in the regression model, they are less useful for a categorical variable, which is represented by a series of indicator variables in the regression model.

The likelihood ratio test was therefore used.

7.6.1.3 Accounting for clustering

Logistic regression assumes that observations in the sample are independent of one another. Because the data are clustered by GP, this assumption is violated (see 7.7). Clustering in a sample can result in a substantial increase in standard errors of the measurements and unless this is allowed for confidence intervals will be too narrow and p values will be too small. It is possible to use standard methods to analyse a summary measure derived for each cluster, but these analyses cannot take account of exposure variables that vary between individuals in the same cluster.[365]

Robust standard errors, which adjusts the confidence intervals without altering the odds ratios, were used to take clustering into account. They are estimated using the variability in the data (measured by the residuals). This method requires a reasonable number of clusters (30 or more) and the use of Wald tests; likelihood ratio tests do not take account of clustering because the log likelihood is not affected by robust standard errors.[365]

7.6.2 Specific analysis

7.6.2.1 Longitudinal care and depth of patient-doctor relationship

In a multivariable logistic regression model the dependent variable was *deep* patient-doctor relationship, a dichotomised version of the patient-doctor depth of relationship scale (0 to 32), where 0=*shallow* (0 to 31) and 1=*deep* (32). The cut-off point chosen is discussed later (8.2.5.3.2).

The dichotomous longitudinal index *known* (whether the doctor had consulted the GP during the continuity defining period) was cross-tabulated with variables of possible patient confounding characteristics:

- sociodemographics (age, sex, ethnicity, marital status, employment, education)
- health (disability and health) and
- consultation (patient-doctor communication and consultation length)

The unadjusted and adjusted odds ratios were also estimated, taking into account the effect of clustering by GP.

The main explanatory variable was the continuous longitudinal care variable consultation *count* – the number of consultations with the study GP during the continuity defining period. As highlighted earlier (7.4.1.1.1), the amount of time spanned by the longitudinal care data varies patient-to-patient. In effect, the *count* for each patient reflects a consultation rate with that doctor (the number of consultations in the time period spanned by the data collection). To adjust for this, the actual amount of time covered by the continuity defining time period was included as a covariate in all longitudinal care-deep relationship analysis.

Data were also examined for a non-linear relationship between *count* and deep relationship by introducing a quadratic term. Multivariable logistic regression of deep relationship with *count* was re-run with patient sociodemographic, health and consultation variables entered into the model. This was done to estimate the odds ratios of a deep relationship when the different potential confounding variables were included in the model.

Variables which were the product of *count* and patient-doctor communication and *count* and *proportion* (the proportion of doctor consultations with the study GP during the continuity defining period) were created and entered into the model, to look for evidence of interactions.

7.6.2.2 Patient-doctor continuity and detection of psychological distress

Continuity of care was explored in terms of depth of relationship first and longitudinal care second. The main analyses were with these factors expressed as continuous variables, but odds ratios were also calculated for their dichotomous forms (*shallow/deep* and *unknown/known*).

Previous research has usually examined GP detection in samples restricted to cases of psychological distress, as defined by some "gold standard". The advantages of this are that analysis is simplified and the findings examine how good the doctor is at not missing a patient case. The disadvantage is that data on patient non-cases are discarded and wider information about doctors' accuracy is not obtained. Therefore, the main analyses were performed on data restricted to psychologically distressed patients (GHQ cases) only; and further analysis was also carried out to investigate the accuracy of GP assessment of all patients.

7.6.2.2.1 GP detection of psychologically distressed patients

For this analysis, data were restricted to patients who were cases according to the GHQ (score of three or greater, 7.4.3.1.4). The dependent variable was GP report of patient distress where 0=No and 1=Yes. Because the sample comprised only GHQ cases, a patient was said to be a GP case when the doctor indicated mild, moderate or severe distress on their four point assessment scale (7.4.3.2.2).

Deep patient-doctor relationship was cross-tabulated with possible confounding variables:

- patient sociodemographics (age, sex, ethnicity, marital status, employment, education)
- patient health (disability, health and GHQ score)
- consultation (patient-doctor communication, consultation length, number of problems and symptom attribution)
- record of any current mental health problem

The unadjusted and adjusted odds ratios were also estimated, taking into account the possible effect by clustering by GP.

Multivariable logistic regression of GP detection with first, patient-doctor depth of relationship, and second longitudinal care, was performed. Analyses were re-run with patient sociodemographic, health, consultation and record of current mental health problem variables entered into the model. This was done to estimate the odds ratios of detection when different confounding variables were included in the model.

All the above analyses were then repeated for different combinations of alternative GHQ (7.4.3.1.4) and GP (7.4.3.2.2) thresholds, as discussed above. Table 7-3 summarises the primary and secondary analyses performed.

Table 7-3 Patient-doctor continuity and GP detection of psychologically distressed patients: summary of analyses
Combination of GHQ and GP thresholds for caseness that were performed as primary and secondary analyses.

Patient-doctor continuity	Threshold for caseness		
	GHQ	GP	
		None/mild	Mild/moderate
Depth of relationship	2/3	Primary	Secondary
	3/4	Secondary	Secondary
Longitudinal care	2/3	Secondary	Secondary
	3/4	Secondary	Secondary

7.6.2.2.2 GP accuracy

Previous research has compared the accuracy of GP assessment with GHQ in one of two ways. In the first is to use a specific accuracy index developed by Goldberg and Huxley.[225] This can be calculated either as correlation between doctor's rating and the number of patient symptoms; or as the amount of agreement between GP and GHQ. The former is measured by Spearman's rank-order correlation and represents an overall ability to make assessments of psychiatric disturbances which are congruent with the patients' symptom levels. The latter can be expressed using Cohen's Kappa coefficient. Unfortunately, they each have their limitations[224] and their use introduces additional jargon.

The alternative option is to calculate the traditional validity coefficients of sensitivity, specificity, positive predictive value and negative predictive value.[365] Sensitivity is the proportion of GHQ cases correctly identified and specificity is the proportion of GHQ non-cases correctly identified. Sensitivity and specificity are not related to the prevalence of the disease in the study population. The positive predictive value is the proportion of GP cases that are GHQ cases, and the negative predictive value is the proportion of GP non-cases that are GHQ non-case. Predictive values do vary with prevalence: the positive predictive value of a test increases with the prevalence of the disease in the population. In addition, an overall misclassification index can be calculated which reflects the proportion of false positive and false negatives. In terms of the comparisons being made between GP and GHQ, the use of validity coefficients is open to the same criticism as Goldberg and Huxley's indices. Notwithstanding this issue, their use is preferable because they are familiar tools to clinicians and epidemiologists and their use has become more common in this field of research.

However, taking this approach only provides information at the level of the doctor and does not permit analysis of how GPs perform at the level of the individual patient. How does GP report vary according to patient-doctor continuity and patient psychological distress? The validity coefficients of GPs seeing patients with deep as opposed to shallow (and known versus unknown) were compared, but in order to maximise the use of data an alternative approach was also undertaken. All patients were entered into a logistic regression model with GP report of distress as the outcome, patient-doctor continuity as the main explanatory variable (depth of relationship first, then longitudinal care) and GHQ score as a covariate. Logistic regression models with and without an interaction term for depth of relationship and GHQ score were then compared.

7.7 Sample size

The size of the sample required for the main study was calculated in relation to the second study hypothesis (4.4.2). This was because a greater number of patients were required to establish whether patient-doctor depth of relationship was associated with GP detection of psychologically distressed patients, than were required to ascertain whether patient-doctor longitudinal care was associated with depth of relationship.

The sample size is important in the design of a study to make sure the study objectives are adequately investigated. The statistical tests described thus far estimate the probability of rejecting the null hypothesis when it is true, also known as a type 1 error, or the significance level (alpha). Another way to express this is to say that it is the probability (alpha) of wrongly concluding that there is a statistically significant difference when, in reality, none exist. Conversely, a type 2 error occurs when a difference is present but it is not detected. The probability of accepting the null hypothesis when it is false is called beta. The power of a study is the probability of correctly rejecting a false null hypothesis and is therefore equal to 1 - beta.

The greater the power of the study, the more confident one can be that a false negative result will be avoided. However, greater power requires a larger sample. The sample size also depends on chosen alpha, the true size of the difference that one is trying to detect, and the standard deviation (SD) of the outcome measure. For binary outcomes, this last requirement is covered by specifying the magnitudes of the target proportions as well as the difference between them. Sample sizes should be calculated for different scenarios, not just for one, to give an idea of the scope of a study.[365] The size of the study needs to be large enough to detect a pre-determined difference, yet not so large as to waste resources or mean it cannot be undertaken.

The conventional levels of alpha and beta tend to be fixed at 5% and between 5% and 20% respectively, hence a power of between 80% and 95%. Commonly the SD of the outcome measure, as in this study, is not known. One way obtain an estimate is by conducting a pilot study while another is to choose a figure based on similar studies. In the absence of either of these options a decision on the size of the difference to be detected was made based on clinical judgement: a difference of between 0.4 and 0.5 standard deviations was thought to be large enough to be important but not so large as to be implausible.

Further adjustments were necessary because of clustering and unequal group sizes. As previously mentioned, the patient data are clustered by GP. Patients who see the same GP are likely to be more similar to one another than patients selected at random, with less variability among responses. Because of the decrease in the variance of the within-cluster responses the apparent differences in outcomes or responses between groups can be magnified.[383] The amount of clustering, or the relatedness of the clustered data, is expressed as the intra-cluster correlation coefficient (ICC) or ϱ. In theory, values range from zero to one and it represents the proportion of the true total variation in the outcome that can be attributed to differences between the clusters.[365] The effect of clustering is to therefore to reduce the effective sample size.[383] The effective size sample can be calculated by dividing the total sample size by a correction factor called the design effect:

$$\text{Design effect} = 1 + \varrho\ (m-1)$$

where m = number of subjects in a cluster and
ϱ = intracluster correlation coefficient

Little appropriate information has been published concerning components of variance or intra-cluster correlation coefficients. Adams *et al*[384] estimated intra-class correlation coefficients in a re-analysis of 31 cluster-based studies in primary care. Noting that ICCs are influenced by the measure, context, method of sampling, and type of individual, the combined data suggested a median ICC of around 0.01 and that 90% of ICCs may be less than 0.055. It was felt that adjusting for an ICC of 0.05 or 0.1 would therefore give, if anything, a conservative estimate of the design effect and hence the sample size.

It was also recognised that it was unlikely that equal numbers of patients would be correctly identified and missed by the GPs, yet standard sample size calculations assume equal numbers in each group. For a study with unequal groups to achieve the same power as a study with equal groups the total sample size must be increased as well as the size of the second group being increased. It was decided to assume a GP correct to incorrect ratio of 2:1 – that is, doctors overall identifying two out three cases correctly.

The sample size was calculated two ways, both using a two-sided 5% alpha and 80% power. The first approach was to estimate, for a given sample of patients, the difference in the mean depth of relationship score likely to be detected for patients in whom GPs correctly identified psychological distress compared with patients in whom the distress was missed. Anticipating that 30 GPs could be recruited into the study and that complete data were to be obtained on 10 patients per GP, the starting total sample size was 300 patients. Adjusting for the resultant design effect (ICC of 0.05) meant the effective sample size would be 208 patients. Using the relevant sample size formula for a two sided comparison of two independent means[365] and a group ratio of 2:1, the estimated detectable difference was 0.415 standard deviations on the depth of relationship scale. Repeating these calculations for an ICC of 0.1 the effective sample size would be 158, and an effect size of 0.479 standard deviations would be detectable.

However, as it has already been proposed that the hypothesis should be tested using logistic regression with GP detection as the outcome, it would be preferable to calculate the sample size on this basis. Unfortunately there is no straightforward way of calculating the size of the sample required when the outcome is binary and the exposure variable continuous. The second approach adopted therefore was to use the comparison of two proportions sample size formula (with continuity correction),[365] comparing correct GP identification of psychologically distressed patients in relation to a dichotomous version (*deep/shallow*) of the depth of relationship scale. Working on the basis that approximately one-quarter of patients would have deep and three-quarters would have shallow patient-doctor relationships, and keeping the overall GP detection rate (2:1 or 66%) and effective sample size of 207 (design effect derived from a rho of 0.05 on 300 patients, 10 per GP), would lead to a detectable odds ratio of 3.037. Although this is quite a sizeable odds ratio and differences smaller than this would be considered clinically significant, the approach is very conservative compared with the planned analysis involving treating depth of relationship as a continuous explanatory variable, and in any case the first sample size calculation presented above indicates a reasonable degree of sensitivity to the underlying relationship between depth of relationship and detection of psychological distress.

8. Main study: results

8.1 Introduction

In this chapter the findings from the cross-sectional study are presented. The first section (8.2) describes the characteristics of the study sample upon which the following analyses are based. In the subsequent sections (8.3 and 8.4) the findings are presented of the specific analyses that were performed to test the two study hypotheses.

8.2 Study sample

Figure 8-1 provides an overview of participant recruitment and data collection. In respect of patients, it can be seen that the denominator for the calculation of percentages varies according to which group are being considered. Hereon, eligible patients who returned a completed questionnaire are referred to as respondents, and respondents who also gave consent to review of their electronic medical records are called participants.

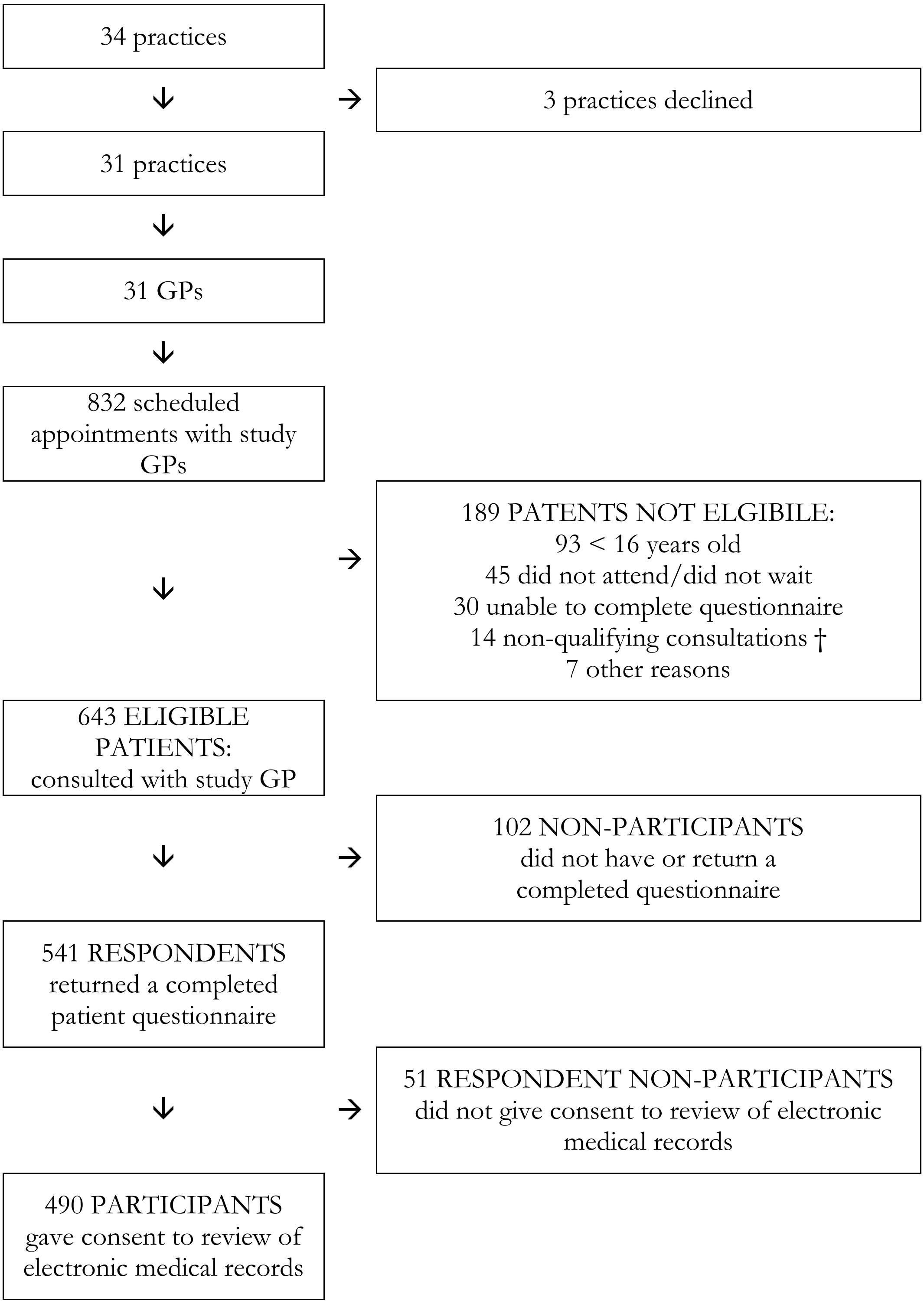
Information pertaining to recruitment (8.2.1) and the quality of the data collected (8.2.2) for eligible patients are presented first. The final part of this section describes the characteristics of the participating practices, GPs, and patients (8.2.3).

8.2.1 Recruitment

8.2.1.1 Practices and GPs

Thirty-four practices were approached and 31 agreed to take part. Two of the three practices who declined did so because of service pressures. The third practice said it was not interested in the research hypothesis.

Figure 8-1 Overview of recruitment & data collection



† Non-qualifying consultation type: minor surgery (including intra-uterine device fittings), blood tests or private medical examinations such as HGV licence.

8.2.1.2 Study surgeries

In total data were collected from 68 study surgeries (between two and three surgeries per GP). These were spread over all the days of the week, with the majority (40, 58.8%) being morning surgeries. The mean number of scheduled appointments in each surgery was 13.2 (SD 3.5, range 6 to 25) and the mean total number of booked appointments per GP was 28.0 (SD 5.7, range 17 to 39). Of the 832 appointments, 643 (77.3%) were eligible. Reasons for ineligibility are shown in Figure 8-1.

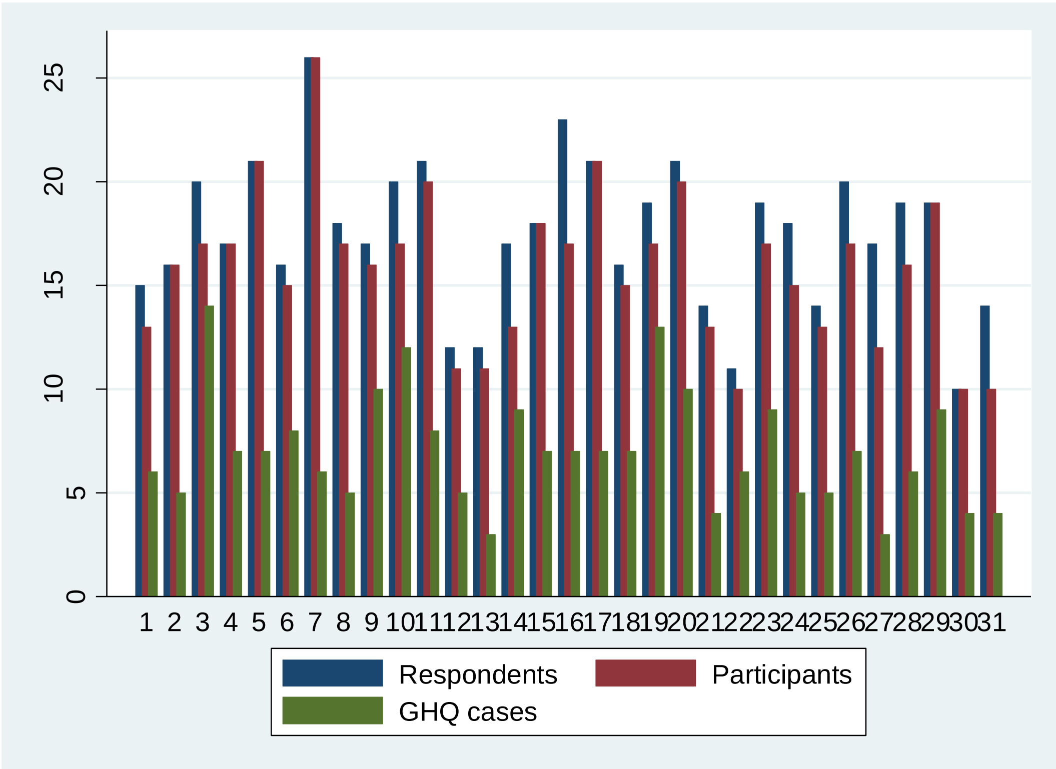
8.2.1.3 Patients

Of 643 eligible patients, there were 102 (15.9%) non-participants: 21 were missed and not given the opportunity to take part in the study, 37 did not take a copy of the questionnaire, and 44 took a copy of the questionnaire but did not return it completed. Therefore, overall 541 (84.1%) patients completed and returned the patient questionnaire – 48 (8.9%) by post. Of these respondents, 51 (9.4%) did not give consent to review their medical records (respondent non-participants) and 490 (90.6%) did (participants).

Figure 8-2 depicts graphically how the number of respondents, participants and psychologically distressed participants varied between GPs. The mean number of respondents per GP was 17.5 (SD 3.6, range 10 to 26). The proportion of patients by GP who gave consent to access their electronic medical records varied from 70.6% to 100.0%. Of those patients, the number of GHQ cases per GP ranged from 3 to 14.

Some of the characteristics of participants can be compared with non-participants and respondent non-participants. Data collected from the appointment systems, doctors and patients during the study surgeries are summarised in Table 8-1. There were no differences between participants and non-participants in respect of sex ($\chi2=0.06$, $p=0.809$), age (t test, $p=0.302$), consultation length (t test, $p=0.772$), discussion of distress ($\chi2=0.70$, $p=0.403$) or GP caseness ($\chi2=2.42$, $p=0.120$). Participants appeared to be better known to study GPs than non-participants though ($\chi2=4.02$, $p=0.045$).

Figure 8-2 Patient recruitment by GP: number of respondents, number of participants and number of psychologically distressed participants (GHQ cases)



Next, participants were compared with patients who returned a questionnaire but did not give access to their medical records ("Respondent without consent" column, Table 8-1). There were no differences in respect of appointment or doctor data. Additional questionnaire data were also examined, but no difference in respect of mean communication scores (t test, p=0.873), GHQ caseness (χ^2=2.19, p=0.139) or deep patient-doctor relationships (χ^2=0.17, p=0.683) were seen.

8.2.2 Data quality

8.2.2.1 Practice and GP enrolment questionnaires

All 31 Practice manager questionnaires were returned completed (one was missing data on the status of one nurse). Fully completed GP enrolment questionnaire were obtained for all 31 GPs.

Table 8-1 Comparison of characteristics of different patient groups
Patient groups determined by whether they returned a completed questionnaire with or without consent to access their electronic medical records

	Patient group †			
	Eligible	**Non-participants**	**Respondent non-participants**	**Participants**
n	643	102	51	490
Appointment data				
Female: no (%)	374 (58.2)	58 (56.9%)	31 (60.8)	285 (58.2)
Age: mean (SD)	52.2 (19.7)	50.4 (19.9)	52.0 (18.6)	52.6 (19.8)
Consultation length: mean (SD)	12.4 (5.1)	12.5 (5.4)	12.6 (5.8)	12.4 (4.9)
Doctor data				
Knowledge (quite-very well): no (%)	408 (64.3)	56 (56.0)	30 (58.8)	322 (66.5)
Discussion (any): no (%)	325 (51.0)	55 (55.0)	25 (49.0)	245 (50.4)
Assessment (GP case): no (%)	329 (52.0)	23 (46.0)	23 (46.0)	247 (51.0)
Patient data				
Communication mean (SD)	-	-	88.0 (11.8)	87.6 (13.7)
No GHQ cases (%)	-	-	16 (35.6)	218 (47.1)
No deep relationship (%)	-	-	10 (23.8)	129 (26.7)

† Patient groups:

Eligible:	patients who were 16 years or older, consulted with the study GP for a qualifying consultation type and were able to complete the questionnaire
Non-participants:	eligible patients who were missed or did not take/return a completed patient questionnaire
Respondent non-participants:	eligible patients who returned the questionnaire completed without consent to access their medical records
Participants:	eligible patients who returned the questionnaire completed with consent to access their medical records

8.2.2.2 Study surgery and other questionnaire data

Data on patient age, sex and eligibility were recorded for all 832 face-to-face appointments that were booked during 68 study surgeries. Table 8-2 provides a summary of data obtained from the patient questionnaire, the GP study surgery form and electronic medical record review. As highlighted earlier, the denominator for the maximum amount of data from each of these sources varies: study surgery form and consultation length 643 (number of eligible patients); patient questionnaire 541 (number of patient respondents); and current mental health problem 490 (number of patient participants).

It can be seen that data is generally complete. GPs answered all three questions for each patient for 632 (98.3%) of the 643 eligible patients. Of the 541 patient respondents, 428 (79.1%) completed all of part one of the patient questionnaire and a sufficient number of communication and depth of relationship items in part two to permit calculation of these respective scale scores.

Patient age and sex data were examined for any disagreement between the patient questionnaire and the reception forms. There were discrepancies for sex for three patients and age for two patients. The data provided by the patient questionnaire were used. Patient questionnaire items 2.1 ("Have you seen this doctor before?") and 2.2 ("How many times in the last 12 months have you seen this doctor?") were compared. Of the 54 patients who replied "No" to question 2.1, 8 (14.8%) patients gave an inconsistent answer (i.e. a response other than "None") to question 2.2.

8.2.2.3 Electronic medical records review

Practices used EMIS LV (24), Torex Synergy (6) and EMIS PCS (1) electronic medical record systems. Most used the appointment systems which come as part of these software packages, but some used an independent programme called Front Desk. The information required could be retrieved from all these different set-ups. 29 out of 31 (93.6%) practices said all consultations were recorded on the computer.

Table 8-2 Data collection during study surgeries and from review of electronic medical records: source and amount of usable data obtained

Category	Source †	Number of data items	N	Complete data (%)‡
PATIENT				
Sociodemographics				
Sex and age [a]	PQ/RF	2	541	541 (100)
Other [b]	PQ	4	541	496 (91.7)
Consultation [c]	PQ	4	541	506 (93.5)
Health				
Disability	PQ	1	541	536 (99.1)
Chronic illness	PQ	1	541	539 (99.1)
GHQ	PQ	12	541	508 (93.9)
Current mental health [d]	EMR	2	490	490 (100)
Consultation				
Length	EMR	1	643	641 (99.7)
Communication	PQ	8	541	522 (96.5)
Patient-doctor relationship				
Depth of relationship	PQ	8	541	525 (97.0)
Overall rating	PQ	1	541	523 (96.7)
DOCTOR				
Discussion	SF	1	643	637 (99.1)
Assessment	SF	1	643	633 (98.4)
Knowledge	SF	1	643	635 (98.8)

† Data sources: PQ – Patient questionnaire; RF – Reception form ; SF – Study surgery form; EMR - Electronic medical record

‡ For individual or groups of data items, this is the amount (%) of complete data obtained in each category. For questionnaire scales this is the amount (%) obtained of minimum data required (GHQ 12 items, GPAQ communication scale four items, and patient-doctor depth of relationship six items) to calculate a score

Notes:

[a] Reception form used to make-up any data missing from patient questionnaire
[b] Marital status, ethnicity, accommodation, employment, education
[c] Have you seen this doctor before? How many problems would you like to discuss with the doctor today? In your opinion, what do you think the cause of your problem is?
[d] Current mental health problem = current/repeat prescription for any psychotropic or any current mental health problem

8.2.2.3.1 Consultation length

Data on consultation length were available on 641 (99.7%) of the 643 eligible appointments. As depicted graphically in Figure 8-3, 627 (97.8%) of consultations were recorded as being between three and 30 minutes long. Because of concerns about the reliability of consultation lengths outside these ranges (11 less than three minutes, three greater than 30 minutes), they were recoded as missing data. In respect of participants, consultation length was available on 477 (97.3%) of patients.

8.2.2.3.2 Longitudinal care

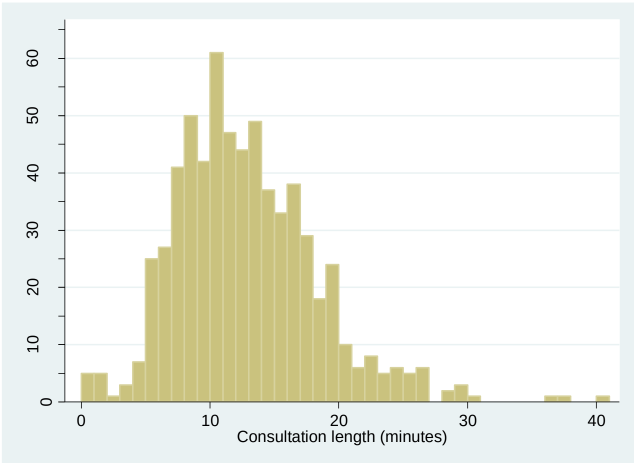
Two patients had just the index consultation in their notes and four patients had no consultations with doctors during the continuity defining period. The date was missing on 21 consultations, five of which were the oldest consultations. Therefore, the longitudinal indices *proportion*, *known*, *sequence* and *UPC* could not be calculated for six patients, and the amount of time included in the continuity defining period was not known for seven patients.

8.2.2.3.3 Other data

The date on which the patient registered with the practice was available for 452 (92.2%) patients. Registration data on a further 35 patients was recoded as missing because of concerns about reliability. For example, for 15 of those patients the registration date was later than the earliest recorded consultation in the longitudinal care data.

In respect of the mental health information extracted from the electronic medical records, the presence or absence or a current or past mental health problem was available for all 490 participants. Data on the type of problem were missing for three patients and data on whether a psychotropic was prescribed was missing for two patients.

Figure 8-3 Distribution of consultation lengths
All available data on eligible patients (n=641)



8.2.3 Sample characteristics

8.2.3.1 Practices

The majority of practices that took part (25, 80.7%) were in urban areas (four inner city, two rural) and were involved in GP registrar training (23, 74.2%). Eleven (35.5%) said they received deprivation payments and the most commonly reported list system was "Encouraged to see the same doctor" (19, 61.3%), followed by "See any doctor" (8, 25.8%) and "Always see the same doctor" (4, 12.9%). The mean number of GPs per practice was 8.0 (SD 2.3, range 3 to 13) and the mean whole-time equivalent (WTE) number of GPS per practices was 5.7 (SD 1.8, range 2 to 9.5).[b] The mean list size was 9662.7 (SD 2996.4, range 4500 to 16300), therefore the average number of patients per whole-time equivalent GP was 1742.5 (SD 297.5, range 1266.9 to 2588.2).

8.2.3.2 Study GPs

GPs who took part were mostly male (20, 64.5%) and white (30, 96.8%). Their mean age was 47.9 years (SD 7.2, range 30 to 60). All were working as principals and 29 (93.6%) were members or fellows of the Royal College of General Practitioners.

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[b] Figures calculated for principal and sessional GPs only, excluded registrars and FYs. Whole time = eight sessions per week, recorded to the nearest 1/8th.

Seven GPs had membership of two royal colleges; one GP was not a member of any. Other memberships reported were: Royal College of Physicians (6), Royal College of Surgeons (1), Royal College of Psychiatry (1), and Royal College of Obstetrics & Gynaecology (2). The mean number of years since qualification was 23.5 (SD 7.0, 7 to 36) and the mean number of years at the current practice was 14.8 (SD 8.1, range 1 to 30). The mean number of clinical (patient contact) sessions was 6.6 (SD 1.3, range 4 to 8.5).

Study GPs' scores on the psychological orientation subscale of the attitudes towards medical care questionnaire completed at enrolment ranged from 5 to 12, with a median of 6. For the purposes of later analysis doctors were divided at a threshold of 6/7 into low (16, 51.6%) and high (15, 48.4%) psychological orientation groups. Their average patient-doctor communication score ranged from 77.1% to 97.7%, with a mean of 87.7% (SD 4.3) and their average consultation length ranged from 9.6 to 15.8 minutes, with a mean of 12.4 minutes.

8.2.3.3 Patients

The sociodemographic and general health characteristics of participating patients are shown in Table 8-3. The mean patient age was 52.6 years (SD 19.8, range 16 to 93) and the majority of patients were white (96.2%) and female (58.2%). Whilst 33.5% of participants considered their general health to be "very good" or "excellent", 49.3% also reported a "long-standing illness, disability or infirmity" (hereon referred to simply as disability). According to the patients' records, participants had been registered with the practice for a mean of 19.5 years (SD 15.4, range 0.0 to 65.1). The median number of repeat medications for each patient was 2 (IQR 0 to 5).

126 (25.7%) patients had a previous and 123 (25.1%) patients had a current mental health problem. Table 8-4 details the number and type of current mental health problems. Of the patients with a current problem, 99 (80.5%) had just one condition listed – 20.2% of all patient participants. The most commonly recorded problems were depression and anxiety, which between them accounted for 71.6% of all current mental health diagnoses.

Table 8-3 Patient participants' sociodemographic characteristics
n=490

	No	% †		No	% †
Age			**Accommodation**		
16-25	54	11.0	Owner-occupier	318	66.8
26-35	61	12.5	Rented/other	158	33.2
36-45	78	15.9			
46-55	61	12.5	**Employment**		
56-65	82	16.7	Employed	202	42.0
66-75	84	17.2	Unemployed	18	3.7
76+	70	14.3	Retired	167	34.7
			Other	94	19.5
Sex					
Male	205	41.8	**Education**		
Female	285	58.2	None	157	33.3
			Basic	165	35.0
Ethnicity			Advanced	73	15.5
White	461	96.2	Higher	77	16.3
Non-white	18	3.8			
			General health		
Marital status			Poor	57	11.7
Single	106	21.8	Fair	120	24.7
Married/living with partner	295	60.6	Good	146	30.0
Divorced/separated	43	8.8	Very good	117	24.1
Widowed	43	8.8	Excellent	46	9.5

† Percentages may not add up to 100 due to rounding

In respect of prescribed psychotropic medications, the majority of participants (82.6%) were not prescribed any, 15.6% were prescribed one and a few (1.8%) were prescribed two. In total there were 94 psychotropic medications recorded, and most of these were antidepressants (69.1%). Other prescriptions were for hypnotics and/or anxiolytics (22.3%) and drugs used in psychosis and related disorders (8.5%).[c]

Therefore, 146 (29.8%) of patients were deemed to have a "current mental problem" (7.3.4.3).

[c] Antidepressants: selective serotonin reuptake inhibitors (SSRIs) and related antidepressants; tricyclic antidepressants (TCAs) and related antidepressants, mono-amine oxidase inhibitors (MAOi); other antidepressants. Hypnotics/anxiolytic: excludes alcohol, antihistamines and B-blockers.

Table 8-4 Patient participants' mental health characteristics

	No	%
Number of current mental health problems		
0	367	74.9
1	99	20.2
2	21	4.3
3	2	0.4
4	1	0.2
Type of current mental health problem		
Depression	78	15.9
Anxiety disorder	28	5.7
Alcohol misuse	13	2.7
Drug misuse	12	2.5
Self-harm	4	0.8
Schizophrenia	3	0.6
Other †	3	0.6
Bipolar disorder	2	0.4
Sleep disorder	2	0.4
Phobic disorders	2	0.4
Other psychotic disorder	1	0.2
Panic disorder	0	0
Eating disorder	0	0

† Other includes: obsessional neurosis, post-traumatic stress disorder, and "stress-related problem" warranting referral to psychiatrists or admission

8.2.3.4 Index consultation

8.2.3.4.1 General characteristics

Table 8-5 summarises some of the general characteristics of the index patient-doctor consultation. Just over half of patients (50.4%) said they wanted to discuss two or more problems at that consultation.

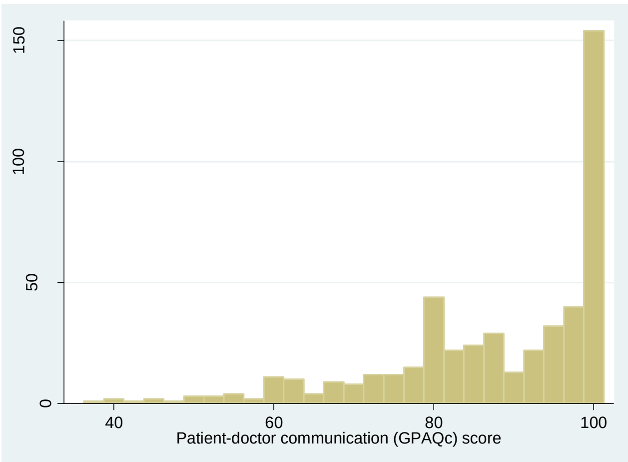
As expected, patient-doctor communication scores were negatively skewed (see Figure 8-4) with a median score of 92.5% (range 37.5 to 100.0). The distribution is presented as quintiles in Table 8-5. As highlighted earlier (section 8.2.2.3.1) the consultation length was also skewed. The median consultation length during the study surgeries was 12 minutes (range 3 to 30) and the mean was 12.4 minutes (SD 5.0). For descriptive purposes data are presented in Table 8-5 in categories of very short, short, medium and long.

Table 8-5 Characteristics of index consultations

	No	%
Number of problems		
1	241	49.6
2	169	34.8
3	62	12.8
4	11	2.3
5 or more	3	0.6
Patient-doctor communication – quintile (range of scores)		
1 (37.5 to 75%)	85	17.7
2 (77.1 to 82.5%)	75	15.6
3 (82.9 to 92.5%)	93	19.4
4 (93.3 to 97.5%)	73	15.2
5 (100%)	154	32.1
Consultation length		
Very short (<5 minutes)	9	1.9
Short (5-9.99 minutes)	130	27.3
Medium (10-14.99 minutes)	196	41.1
Long (15 minutes+)	142	29.8

† Percentages may not add up to 100 due to rounding

Figure 8-4 Distribution of patient-doctor communication scores



8.2.3.4.2 Psychological characteristics

As detailed in Table 8-6, 28.7% of patients thought their main complaint was wholly or partly emotional in origin; and GPs reported spending at least some of the consultation discussing psychological problems in 50.4% of encounters. Doctors estimated that half or more of the consultation was spent discussing psychological or emotional issues with 130 (26.7%) of patients.

The levels of patient psychological distress in consultations according to GPs' assessments and patients' GHQ scores are shown in Figure 8-5. GPs judged 247 patients (51.0%, 95% CI 46.5% to 55.6%) to be mild, moderately or severely psychologically distressed; by GP the proportion of GP cases varied from 18.1% to 100.0%. With the higher threshold for GP caseness, 129 (26.7%, 95% CI 22.8% to 30.8%) patients were thought to be moderately or severely psychologically distressed.

As expected, the distribution of patient GHQ scores was positively skewed, with a median score of 2 (IQR 0 to 6) and a mean of 3.6 (SD 4.0). Using a cut-off of 2/3, the number of GHQ cases of psychologically distressed patients was 218 (47.1%, 95% CI 42.5% to 51.7%); by GP the proportion of GHQ cases varied from 24.0% to 87.5%. Using a cut-off of 3/4, 185 (40.0%, 95% CI 35.5% to 44.6%) patients were GHQ cases.

Discussion of psychological problems and prevalence of psychological distress appeared to be linked. Figure 8-6 illustrates that a greater proportion of the consultation spent discussing psychological issues was associated with both higher levels of GP-reported patient distress and GHQ caseness.

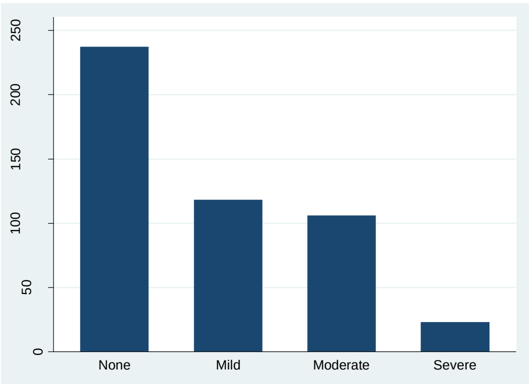
Of the 146 patients who had a "current mental health problem" (7.3.4.3), 95 (69.3%) were a GHQ cases, compared with 123 (37.7%) of the 326 patients whose notes did not suggest an active psychological or psychiatric issue (χ^2=38.70, p=0.000).

Table 8-6 Patient and GP data on psychological aspects of consultation
Patient problem attribution and GP discussion of patient psychological problems

	Patients/consultations	
	No	**% †**
Patient problem attribution		
Physical	239	51.8
Physical and emotional	104	22.6
Emotional	28	6.1
Other reasons	90	19.5
Proportion of consultation spent discussing psychological issues		
None	241	49.6
Some	115	23.7
About half	44	9.1
Most	52	10.7
All	34	7.0

Figure 8-5 Prevalence of patient psychological distress

a) According to GP



b) According to GHQ

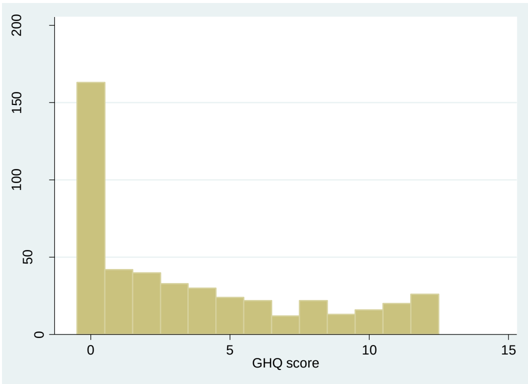
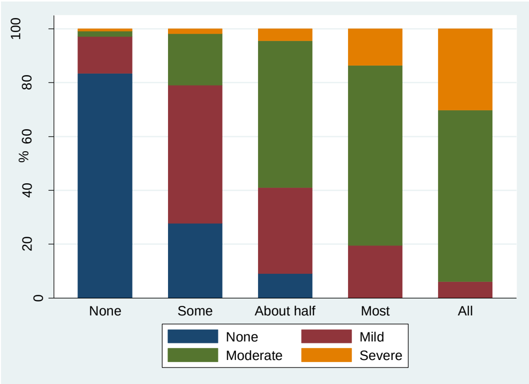
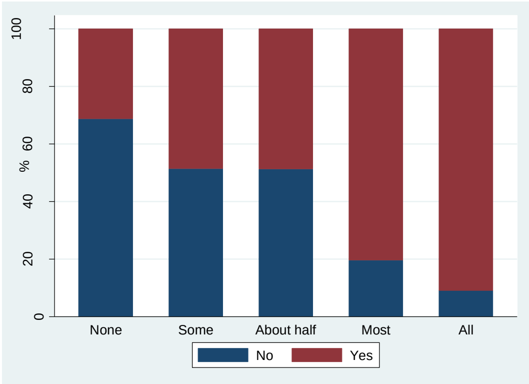


Figure 8-6 Prevalence of patient psychological distress by proportion of consultation spent discussing psychological issues

a) GP assessment of patient psychological distress

b) GHQ assessment of patient psychological distress





8.2.4 Longitudinal care

Figure 8-7 provides an overview of longitudinal data collection. Reviewing the electronic medical records of the 490 patients who gave their consent meant that, including the index visit, 6924 consultations were examined for the date, type and professional seen.

Of the 488 patients who had had at least one prior qualifying entry in their notes (7.3.4.2.2): 47 (9.6%) had fewer then ten entries ever and 193 (39.6%) had more than ten entries during the previous 12 months. The median number of years of data examined for each patient was 0.98 (IQR 0.94 to 1.59). A total of 102 entries (0.02%) were for failed consultations ("Did not attends" or ""“DNAs") and these were excluded from all further analysis.

Figure 8-7 Longitudinal care data collection

541 returned questionnaires		
↓	→	51 patients did not give consent
6924 qualifying entries † 490 patients		
↓	→	490 index consultations
6434 qualifying entries † 488 patients ▲		
↓	→	102 failed consultations ("DNAs")
6332 doctor and nurse encounters † 488 patients		
↓	→	2196 consultations with nurses
4136 doctor only encounters ‡ 484 patients □		

See 7.3.4.2.2 for description of qualifying entries
Encounters = surgery, telephone, home visit or unspecified

▲Two patients had index consultation only
†: Date missing on 21 consultations (5 oldest consultations)
‡: Date missing on 13 consultations
□: No consultations with doctors in continuity defining period for six patients

8.2.4.1 Doctors and nurses

During the continuity defining period, 2196 (34.7%) of all previous patient appointments were with nurses and 4136 (65.3%) were with doctors (see Figure 8-7). The majority of encounters were at the surgery (5662, 89.4%), the next most common being a telephone consultation (544, 8.6%). Only 63 appointments (1.0%) were home visits, with a further 63 (1.0%) being unspecified. The mean total number of consultations was 12.9 (SD 7.9, range 1 to 78) and the mean number of different doctors and nurses consulted was 5.9 (SD 2.3, range 1 to 16).

During the 12 months before the index consultation, patients had a median of 8 (IQR 4 to 14) and a mean of 10.5 (SD 9.4, range 0 to 78) doctor or nurse appointments. The median number of appointments was observed to increase with age, rising from 4 in the youngest age group (16 to 25 years) to 13.5 in the oldest (76 years or older).

8.2.4.2 Doctors

This section describes longitudinal care with doctors only. During the continuity defining period the mean number of different doctors consulted was 2.7 (SD 1.9, range 0 to 9) and the average number of encounters was mean 8.4 (SD 5.0, range 0 to 34) and median 8 (IQR 5 to 10). Of the 4136 doctor consultations during the continuity defining period, 1880 (45.5%) were with study GPs. Looking at just the 12 months prior to the index consultation, participants had between 0 and 34 doctor consultations, with a median of 5 (IQR 2 to 9) and a mean of 6.7 (SD 5.9). During this period 2080 (55.2%) of the 3770 patient encounters with doctors were with study GPs.

From the consultation pattern observed during the continuity defining period, the study GPs were the usual doctor (see 7.4.1.1.2 for definition) for 73.4% of patients. Figure 8-8 shows the distribution of UPC scores: the mean was 0.58 (SD 0.24, range 0.17 to 1.00).

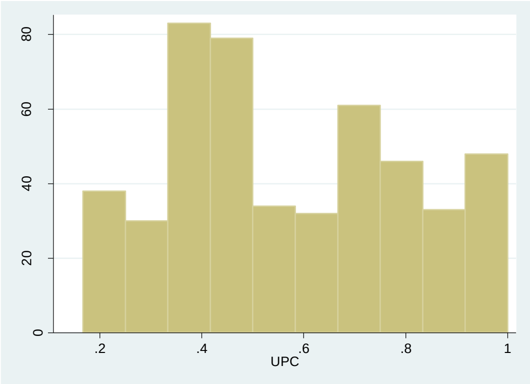
8.2.4.3 Study GP

This section concerns longitudinal care with the study GP only. Some data were available from patient self-report in the patient questionnaire (questions 2.1 and 2.2). The main longitudinal care indices were calculated on data obtained from the electronic medical record review. Associations with patient and consultation factors are also presented.

8.2.4.3.1 Patient self-report data

According to patient self-report most (423 or 89.8%, 95% CI 86.7 to 92.4) patients had seen the study GP before, and 399 (82.9%, 95% CI 78.3 to 86.2) had seen them at least once during the previous 12 months.

Figure 8-8 Patient-doctor longitudinal care: distribution of usual provider continuity (UPC) scores
Proportion of doctor consultations with usual doctor during continuity defining period



Comparing electronic medical record with patient self-report data, there was agreement for whether the patient had been seen before for 420 (90.3%) patients; the notes identified a contact with the study GP for 8 (1.7%) patients who said they had never seen the doctor before; and for only 37 (8.0%) patients was a previous encounter reported but not present in the records during the continuity defining period.

8.2.4.3.2 Longitudinal care indices

400 (82.6%) of patients had seen the study GP at least once during the continuity defining period (*known* index) and 269 (55.6%) of patients had encountered the same doctor at the previous consultation (*sequence* index).

The distribution of the number of consultations with the study GP (longitudinal care index *count*), which includes the index visit, is shown in Figure 8-9. The average number of consultations during the continuity defining period was median 4 (IQR range 2 to 6) and mean 4.8 (SD 4.0, range 1 to 27).

Figure 8-9 Patient-doctor longitudinal care: distribution of *count* index
Number of consultations with study GP during the continuity defining period, including the index consultation

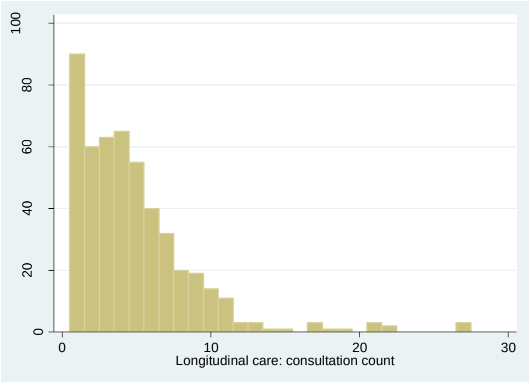


Figure 8-10 Patient-doctor longitudinal care: distribution of *proportion* index
Proportion of doctor consultations with study GP during the continuity defining period

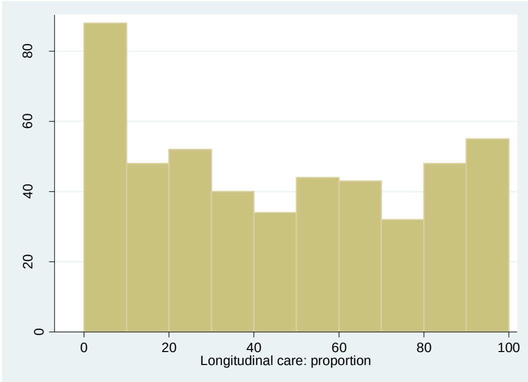


Figure 8-10 shows the distribution of the *proportion* of doctor encounters that were with the study GPs (n=484; the number of patients who had at least one consultation with a doctor during the continuity defining period). The mean *proportion* of patient-doctor encounters that were with the study GP was 44.0% (SD 33, range 0 to 100). 146 (30.2%) patients had fewer than 20% and 80 (16.5%) had more than 80% of their consultations with the study GP.

8.2.4.3.3 Patient-study GP longitudinal care associations

Later analyses examine the longitudinal care data for associations with deep patient-doctor relationships (8.3) and GP detection of patient psychological distress (8.4). Patient-doctor longitudinal care may be linked with other factors which may confound any association, and for this reason Table 8-7 and Table 8-8 are presented. They show patient sociodemographic, health and consultation characteristics, the percentage of patients *known* to the doctor and the odds ratios of being *known* by the study GP. The longitudinal index *known* has been used because it represents a special case of the longitudinal care index *count*, i.e. a patient is said to be “known” if the number of consultations with the study GP was greater than one. Otherwise, in order to construct these tables the alternative would have been to choose an arbitrary dichotomisation point for the number of consultations with the study GP.

Table 8-7 Proportion and odds ratios of *known* according to patient sociodemographic and health characteristics

		Known		p †			Known		p †
	n	%	OR (95% CI)			n	%	OR (95% CI)	
Sex					**Employment**				
Male	203	85.7	1.0	0.091	Employed	198	75.3	1.00	0.002
Female	281	80.4	0.7 (0.4, 1.1)		Unemployed	18	77.8	1.2 (0.4, 3.5)	
					Retired	166	91.0	3.3 (1.8, 6.2)	
Age					Other	93	86.0	2.0 (1.2, 3.6)	
16-25	51	66.7	1.0	<0.001					
26-35	60	70.0	1.2 (0.6, 2.2)		**Education**				
36-45	78	83.3	2.5 (1.1, 5.9)		None	156	83.97	1.0	0.032
46-55	60	81.7	2.2 (0.9, 5.4)		Basic	162	82.10	0.9 (0.4, 1.9)	
56-65	82	87.8	3.6 (1.8, 7.1)		Advanced	73	75.34	0.6 (0.3, 1.2)	
66-75	83	90.4	4.7 (2.0, 11.1)		Higher	75	89.33	1.6 (0.6, 4.3)	
76+	70	90.0	4.5 (2.0, 10.0)						
					Disability				
Ethnicity					No	235	77.5	1.0	<0.001
White	455	83.7	1.0	0.009	Yes	244	87.7	2.1 (1.3, 3.2)	
Non-white	18	61.1	0.3 (0.1, 0.7)						
					Health				
Marital status					Poor	57	89.5	1.0	0.019
Single	103	74.8	1.00	0.029	Fair	119	87.4	0.8 (0.3, 2.3)	
Married/living with partner	292	84.6	1.9 (1.2, 2.8)		Good	145	80.7	0.5 (0.2, 1.1)	
Divorced/separated	43	86.1	2.1 (0.8, 5.7)		Great	159	78.0	0.4 (0.2, 1.0)	
Widowed	43	88.4	2.6 (0.9, 7.6)						
					GHQ				
					Non-case	241	77.6	1.0	0.006
					Case	217	87.6	2.0 (1.2, 3.4)	

† LR $\chi 2$ test

Table 8-8 Proportion and odds ratios of *known* according to consultation characteristics

		Known		p †
	N	%	OR (95% CI)	
Consultation length				
Very short	9	55.6	0.3 (0.1, 0.9)	0.058
Short	127	81.1	0.9 (0.5, 1.6)	
Medium	195	82.6	1.00	
Long	142	85.9	1.3 (0.7, 2.3)	
Patient-doctor communication (quintiles)				
1	84	72.6	1.00	<0.001
2	73	79.5	1.5 (0.7, 3.1)	
3	92	75.0	1.1 (0.6, 2.0)	
4	72	88.9	3.0 (1.3, 6.9)	
5	154	92.9	4.9 (2.7, 8.9)	
Number of problems				
Single	237	78.5	1.0	0.066
Multiple	243	86.4	1.7 (1.0, 3.2)	
Emotional attribution				
None	325	80.3	1.0	0.229
Some	131	87.0	1.7 (1.0, 3.2)	

† LR $\chi 2$ test

The tables suggest an increasing propensity for being *known* with increasing patient age, higher communication scores, patient disability and being a GHQ case, and a decreasing propensity for being *known* with being non-white and reporting better health. Patients' marital status, employment status, and educational achievement also appear to be associated with longitudinal care. Evidence of an association was weakest for longer consultations, number of problems, patient sex and emotional attribution.

8.2.5 Patient-doctor relationship

Data on the patient-doctor relationship were available from the GP perspective (8.2.5.1) and the patient perspective (8.2.5.2 and 8.2.5.3). The main variable of interest in this study was the patient-doctor depth of relationship score (8.2.5.3).

Figure 8-11 Distribution of GPs' global scores of how well they know patients

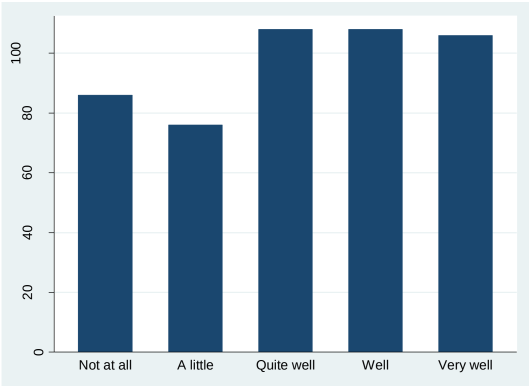
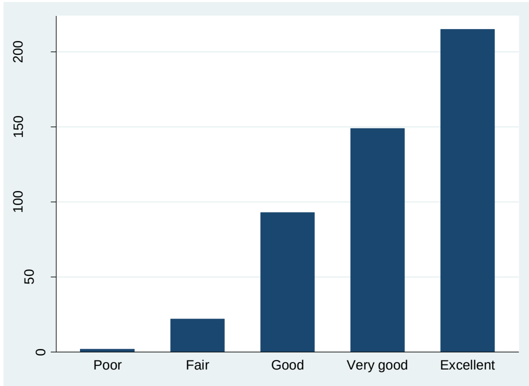


Figure 8-12 Distribution of patients' ratings of patient-doctor relationship



8.2.5.1 GP global knowledge of patient

Doctor's five point global assessment of how well the patients were known to them were fairly evenly distributed appearance (Figure 8-11). The median score was 2 (IQR 1 to 3). GPs said they knew 214 (44.2%) patients "well" or "very well".

8.2.5.2 Patient-doctor overall relationship rating

Figure 8-12 shows the distribution of participant responses to the single question item that asked patients to make an overall rating of their relationship with the study GP. Consistent with the distribution of the patient-doctor depth of relationship score, the responses were overwhelmingly positive with 364 (75.7%) of patients reporting a "very good" or "excellent" patient-doctor relationship.

8.2.5.3 Patient-doctor depth of relationship

In order to confirm high internal reliability and a single factor structure (chapter 6), the psychometrics of the patient-doctor depth of relationship scale was checked first. For the purposes of longitudinal care-depth of relationship analysis, as described in 7.6.2.1, scaled scores were then dichotomised into *shallow/deep* relationships. Finally, associations with depth of relationship that may be relevant for the depth of relationship-GP detection of patient psychological distress analysis are presented.

8.2.5.3.1 Questionnaire characteristics

Cronbach's α for the eight depth of relationship items was 0.93. Repeat principal factor analysis confirmed a single factor that explained 92.0% of the variance in the data. (The factors loadings are shown in Table 11-6, Appendix 11.2.) The distribution of patient-doctor depth of relationship scale scores is shown in Figure 8-13. As can be seen, data were highly negatively skewed. The median score was 26 (IQR 19 to 32) and the mean score was 24.2 (SD 7.8, range 0.0 to 32.0).

8.2.5.3.2 Dichotomisation of depth scores into deep and shallow

Later analyses examine the data first for an association between longitudinal care and patient-doctor depth of relationship as the outcome; and then between patient-doctor depth of relationship as the main explanatory variable and GP detection of patient psychological distress. Its non-normal distribution means that it cannot be entered into a linear regression model as an outcome in its natural form, in which case either transformation is required to normalise the data or a binary form of the variable derived in order that logistic regression methods can be used. Different methods of transforming the data failed to obtain more normally distributed appearance, so for the longitudinal care-depth of patient-doctor relationship analysis it was decided to dichotomise patient-doctor relationship and perform logistic regression. For the second part of the study, depth of patient-doctor relationship and GP detection of patient psychological distress, explanatory variables can be non-normally distributed and it was therefore entered into the model in its untransformed continuous form.

Figure 8-13 Distribution of patient-doctor depth of relationship scores

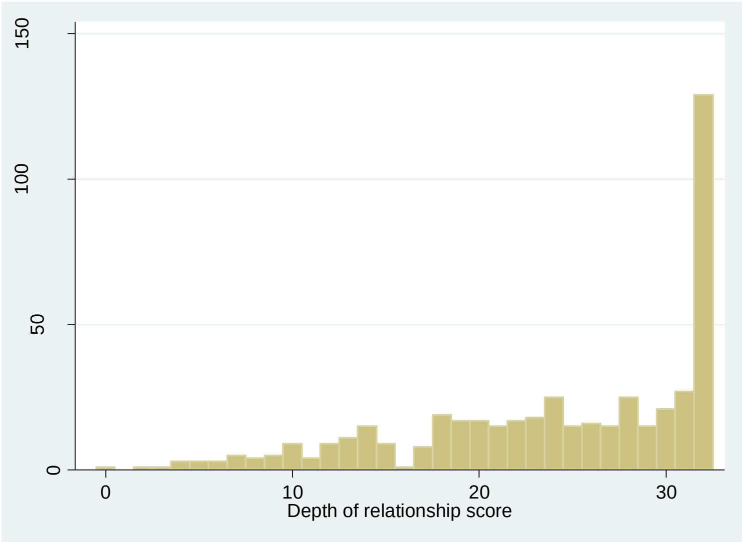


Table 8-9 shows the possible cut-off points considered in order to create a new binary variable for the purpose of longitudinal care-depth of the patient-doctor relationship analysis: *shallow* (0) or *deep* (1) patient-doctor relationship. As can be seen, small changes in the shallow-deep threshold lead to substantial differences in the proportion of patients included in the deep group. This table also shows how the characteristics of the different patient groups created differ as the threshold increases from 25/26 (around the median) to 31/32. As might be expected, the mean number (*count*) and *proportion* of consultations with the study GP, the mean patient age, and the mean communication score all increase; and the proportion of female patients and mean consultation lengths changes very little or not at all.

It was decided to divide the sample into *shallow* and *deep* patient-doctor relationships at the 31/32 threshold (129 or 26.7% of patients scored 32) for two reasons: first, to ensure a reasonable number of participants in each group; and second, on the basis that patients with patient-doctor depth of relationship scores of 32 probably represent a distinct patient population.

Table 8-9 Different thresholds for dichotomisation of patient-doctor depth of relationship into *deep* or *shallow*
Effect on size and characteristics of deep patient-doctor relationship group

	Deep patient-doctor relationship Cut-off shallow/deep						
	25/26	**26/27**	**27/28**	**28/29**	**29/30**	**30/31**	**31/32**
Patient characteristics							
Number (%) with deep relationship	248 (51.4)	232 (48.0)	220 (45.6)	192 (39.8)	177 (36.7)	156 (32.3)	129 (26.7)
Number (%) female	137 (55.2)	127 (54.7)	122 (55.5)	107 (55.7)	97 (54.8)	88 (56.4)	73 (56.6)
Mean (SD) age	59.0 (17.9)	59.0 (17.6)	59.3 (17.5)	60.2 (17.4)	60.3 (17.6)	61.1 (17.5)	62.0 (17.4)
Longitudinal care							
Mean (SD) *count*	6.5 (4.4)	6.5 (4.4)	6.6 (4.5)	6.9 (4.6)	7.0 (4.5)	7.1 (4.7)	7.4 (4.9)
Mean (SD) *proportion*	59.5 (29.4)	59.3 (29.6)	59.0 (29.8)	61.6 (28.9)	62.8 (28.6)	63.0 (28.3)	64.3 (27.3)
Consultation characteristics							
Mean (SD) communication score	93.5 (9.0)	93.8 (8.8)	94.2 (8.5)	94.8 (8.2)	95.3 (8.0)	95.2 (8.3)	95.8 (7.6)
Mean (SD) consultation length	12.5 (4.4)	12.5 (4.4)	12.5 (4.4)	12.5 (4.2)	12.6 (4.3)	12.5 (4.2)	12.5 (4.2)

8.2.5.3.3 Patient-doctor depth of relationship associations

Exploration of data for an association between patient-doctor depth of relationship and GP detection of patient psychological distress may be confounded by other factors. How depth of relationship varies with different patient and consultation characteristics is shown in Table 8-10 and Table 8-11. *Deep* patient-doctor relationships can be seen to be associated with patient age, marital and employment status, disability, consultation length, communication score and number of problems. There is weak evidence of any association with patient ethnicity, education, health, GHQ status, sex, and emotional attribution.

8.2.6 Summary

GPs in 91.2% of practices approached agreed to take part and of the 643 eligible patients who attended during a nominated study surgery, 490 (76.2%) returned a patient questionnaire with consent to retrieve longitudinal care and mental health data from their medical records. Overall, the amount of missing data from each source was low, but when the data are used jointly in multivariable analyses, missing data will reduce further the size of the sample that is examined.

By definition, the primary longitudinal care index *count* was available on all patients, but 484 (98.8%) participants had had at least one previous encounter with a doctor during the continuity defining period, allowing the secondary longitudinal care indices to be calculated. The study GP had been seen by 89.8% of patients before and was their usual doctor for 73.4%. The mean *proportion* of patient-doctor encounters that were with the study GP was 44% during the continuity defining period, rising to 55.2% during the previous 12 months. Of the 97.0% of participants in whom a patient-doctor depth of relationship scores could be calculated, it was deep for 26.7%. Psychological and emotional issues were common, with GP and GHQ estimates of 51.0% and 47.1% respectively.

Table 8-10 Proportion and odds ratios of *deep* patient-doctor relationship according to patient sociodemographic and health characteristics

			Deep relationship	p †				Deep relationship	p †
	n	%	Crude OR (95% CI)			n	%	Crude OR (95% CI)	
Sex					**Employment**				
Male	203	27.6	1.00	0.632	Employed	198	16.7	1.00	<0.001
Female	280	26.1	0.9 (0.7, 1.3)		Unemployed	17	23.5	1.5 (0.5, 4.6)	
					Retired	166	40.4	3.4 (2.4, 4.9)	
Age					Other	93	25.8	1.7 (1.0, 3.0)	
16-25	53	3.8	1.00	<0.001					
26-35	58	15.5	4.7 (1.0, 21.8)		**Education**				
36-45	77	22.1	7.2 (1.9, 28.1)		None	156	33.3	1.00	0.199
46-55	61	26.2	9.1 (1.8, 45.3)		Basic	161	26.1	0.7 (0.4, 1.1)	
56-65	81	26.0	8.9 (1.9, 41.1)		Advanced	73	23.3	0.6 (0.3, 1.1)	
66-75	84	33.3	12.8 (3.2, 50.6)		Higher	75	18.7	0.5 (0.2, 1.1)	
76+	69	52.2	27.8 (6.7, 116.2)						
					Disability				
Ethnicity					No	232	19.4	1.00	0.001
White	455	27.3	1.00	0.107	Yes	246	32.9	2.0 (1.3, 3.1)	
Non-white	18	11.1	0.3 (0.1, 1.3)						
					Health				
Marital status					Poor	57	36.8	1.00	0.059
Single	104	14.4	1.00	0.002	Fair	118	30.5	0.8 (0.4, 1.4)	
Married/ living with partner	291	26.8	2.2 (1.1, 4.4)		Good	145	26.9	0.6 (0.3, 1.3)	
Divorced/separated	42	45.2	4.9 (2.0, 12.1)		Great	159	26.3	0.4 (0.2, 0.8)	
Widowed	43	39.5	3.9 (1.3, 11.9)						
					GHQ				
					0 to 2	243	24.3	1.00	0.186
					3 to 12	214	29.0	1.3 (0.9, 1.8)	

† LR χ^2 test

Table 8-11 Proportion and odds ratios of *deep* patient-doctor relationship according to consultation characteristics

		Deep relationship		p †
	n	%	Crude OR (95% CI)	
Consultation length				
Very short (<5 minutes)	8	12.5	0.3 (0.1, 1.7)	0.034
Short (5-9.99 minutes)	129	21.7	0.6 (0.3, 0.9)	
Medium (10-14.99 minutes)	193	33.2	1.0	
Long (15 minutes+)	140	25.0	0.7 (0.4, 1.1)	
Patient-doctor communication (quintiles)				
1	85	4.7	0.1 (0.0, 0.1)	<0.001
2	75	9.3	0.1 (0.0, 0.3)	
3	91	17.6	0.2 (0.1, 0.4)	
4	73	32.9	0.5 (0.3, 0.8)	
5	153	51.0	1.0	
Number of problems				
Single	237	20.3	1.0	0.006
Multiple	243	32.1	1.9 (1.2, 2.9)	
Emotional attribution				
None	323	25.7	1.0	0.832
Some	132	26.5	1.1 (0.7, 1.5)	

† LR χ^2 test

8.3 Patient-doctor longitudinal care and deep relationship

8.3.1 Introduction

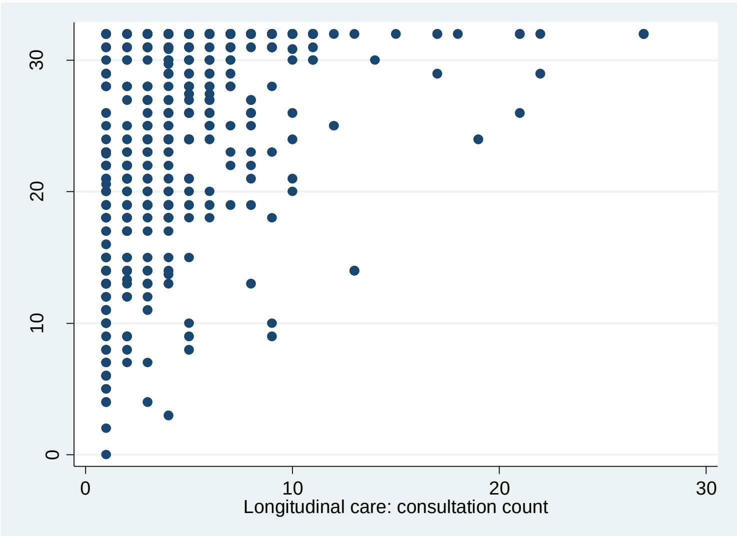
The aim of this section is to test the first study hypothesis (4.4.1) that longitudinal care contributes to patient-doctor depth of relationship. To recap, the characteristics of the main explanatory and dependent variables were as follows.

The explanatory variable longitudinal care was primarily operationalised as consultation *count* (7.4.1.1.1), adjusted for patient-to-patent variation in the duration of continuity defining period (7.6.2.1). Including the index consultation, the distribution of number of patient-study GP consultations was positively skewed (Figure 8-9), with a median of 4 (IQR range 2 to 6) and a mean of 4.8 (SD 4.0, range 1 to 27). As explained in section 8.2.5.3.2, the dependent variable was deep patient-doctor relationship. This is a binary version of the patient-doctor depth of relationship scale created because the scores in the sample were negatively skewed, with a median of 26 (IQR 19 to 32) and a mean of 24.2 (SD 7.8, range 0.0 to 32.0).

When looking for associations scatter plots can provide useful preliminary information, but the appearance of Figure 8-14 (a scatter plot of paired consultation *count* and patient-doctor depth of relationship score data, n=483) reflects the problem of both measures being skewed. As a consequence of most patients having 11 or fewer consultations (469, 95.7%) and over a quarter of patients reporting maximum depth of relationship scores (129, 26.7%), data are confined to a triangular area on the left of the graph. No low depth of relationship scores were seen for higher numbers of consultations.

The primary analysis was for an association between the longitudinal index *count* and deep patient-doctor relationship. The secondary analyses were for associations between the longitudinal indices *known*, *sequence* and *proportion* and deep patient-doctor relationships.

Figure 8-14 Scatter plot of patient-doctor longitudinal care (*count*) and depth of relationship scores



8.3.2 Primary longitudinal care index

The crude odds ratio of *deep* patient-doctor relationships with increasing *count* in a logistic regression model (8.3.2.1) is reported first. Next, logistic regression models for linear and non-linear *count-deep* associations are compared (8.3.2.2). The logistic model for the non-linear relationship is adopted and used to predict the probability of deep patient-doctor relationships with increasing *count*. Finally two possible interactions are explored (8.3.2.3).

8.3.2.1 ***Count-deep*** association

Allowing for clustering by GP, the odds ratio of deep patient-doctor relationship for every additional consultation with the study GP was 1.27 (95% CI 1.17 to 1.39, $p<0.001$). Corrected for the time spanned by the continuity defining period, the OR was 1.25 (95% CI 1.15 to 1.36, $p<0.001$). (All further analysis is adjusted for time spanned by the continuity defining period.) Adopting a lower cut-off for *shallow/deep* relationships would have given a larger odds ratio. For example, for thresholds of 28/29 and 25/26 the crude ORs would have been 1.34 (95% CI 1.19 to 1.51) and 1.44 (95% CI 1.25 to 1.66) respectively.

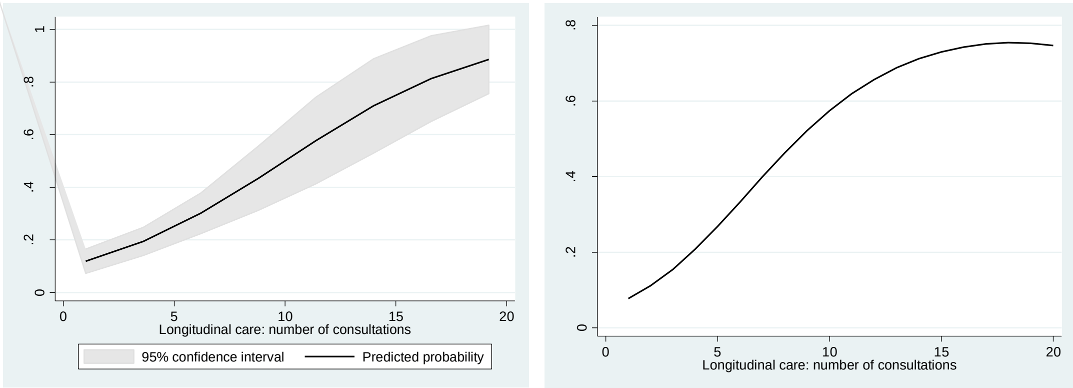
To aid interpretation, the results of the logistic regression model can be used to construct a graph of the predicted probabilities of an outcome for a range of exposure variable values. Figure 8-15a depicts graphically the probability of a deep patient-doctor relationship with increasing number of consultations. The confidence intervals are observed to widen with more consultations, probably because less data are available.

This model assumes that the relationship between number of consultations and the predicted probability of deep patient-doctor relationship is linear. There is a simple and plausible reason to suppose why this may not be true: after a “threshold” number of satisfactory encounters a maximal depth of relationship might be established that cannot be improved with further visits. Such non-linearity can be introduced into logistic regression by adding transformations on the right-hand side of the model.

Figure 8-15 Predicted probability of *deep* patient-doctor relationship with number of consultations (*count*)

a) Logistic regression model for linear relationship

b) Logistic regression model for non-linear (quadratic) relationship



8.3.2.2 Exploration of non-linear *count-deep* relationship

In order to explore whether the relationship between consultation *count* and deep patient-doctor relationship was quadratic, a *count*-squared term was introduced into the unadjusted logistic regression model. Comparing the linear and non-linear models, the non-linear model appeared to fit better (LR test $p<0.001$).

The overall odds ratio of deep patient-doctor relationship for every additional consultation changed from 1.2 (95% CI 1.1 to 1.4) in the linear model to 1.6 (95% CI 1.3 to 1.8, *count*-squared OR 0.99 (95% CI 0.98 to 0.99) in the quadratic model. However, because the model is now non-linear, the odds ratio is less meaningful. Figure 8-15b is a more helpful way of understanding the observed relationship between the probability of a deep patient-doctor with an increasing number of patient-doctor encounters. It suggests that patient-doctor relationships may form over fewer consultations and reach a threshold quicker than in the linear model. All further analysis was performed using the quadratic model.

Table 8-12 Multivariable logistic regression analysis of patient-doctor longitudinal care (*count*) and odds ratios of deep relationship, adjusted for potential confounders

	OR of *deep* relationship by *count* (95% CI)	N
Model one: unadjusted	1.6 (1.3, 1.8)	476
Model two: adjusted for patient sociodemographic characteristics		
Sex	1.6 (1.3, 1.8)	476
Age †	1.5 (1.3, 1.7)	476
Ethnicity	1.6 (1.3, 1.8)	466
Marital status	1.5 (1.3, 1.8)	473
Employment	1.6 (1.3, 1.8)	467
Education	1.6 (1.3, 2.0)	458
All sociodemographic characteristics	1.5 (1.3, 1.7)	448
Model three: adjusted for patient health characteristics		
Disability	1.5 (1.3, 1.8)	471
General health	1.6 (1.3, 1.8)	472
All health characteristics	1.6 (1.3, 1.8)	470
Model three: adjusted for consultation characteristics		
Length †	1.5 (1.3, 1.8)	463
Patient-doctor communication †	1.5 (1.3, 1.8)	471
All consultation characteristics	1.5 (1.3, 1.8)	459
Model four: adjusted for all patient sociodemographic, patient health and consultation variables	1.5 (1.2, 1.8)	431

† Entered as continuous variables

Table 8-12 shows the effect on the odds ratio for a *deep* patient-doctor relationship by *count* when adjusted for patient and consultation characteristics that might potentially confound the association (8.2.4.3.3). (The odds ratios for a *deep* patient-doctor relationship by each confounder are shown in Table 8-10 and Table 8-11.) There is little evidence of confounding after adjustment either individually or by group. Adjusted for all patient sociodemographic, health and consultation factors, the overall odds ratio of a deep patient-doctor relationship with increasing consultation *count* was 1.5 (95% CI 1.2 to 1.8, $p<0.001$).

8.3.2.3 Exploration of possible interactions

One of the objectives of the first study hypothesis (4.4.1) was to examine the data for two possible interactions. The first concerned the communication skills of study GPs. In the non-linear logistic regression model, the adjusted odds ratio of deep patient-doctor relationship by communication score was 1.13 (95% CI 1.08 to 1.17, p<0.001). It is possible that GPs who were rated by their patients as having superior communication skills achieved deep patient-doctor relationships in fewer consultations. This was explored by comparing models with and without the *count*-communication interaction: evidence of a difference was weak (LR test p=0.074).

The second possible interaction explored was between the number of consultations and the *proportion* of doctor consultations with the study GP: patients with a higher *proportion* of doctor visits to the study GP might have achieved deep patient-doctor relationships in fewer consultations. However, in the non-linear logistic regression model *proportion* was not independently associated with deep patient-doctor relationships (adjusted OR 1.00, 95% CI 0.99 to 1.02, p=0.445) and when models with and without the *count-proportion* interaction were compared, there was poor evidence of interaction (LR test p=0.417).

8.3.3 Secondary longitudinal care indices

Having observed an association between the continuous index of longitudinal care *count* and presence of *deep* patient-doctor relationship, secondary analysis was performed for associations with the longitudinal care binary indices of *known* and *sequence*, and with the continuous index *proportion*.

Deep relationships were present in 125 of 395 (31.7%) of patients who had encountered the study GP during the continuity defining period (longitudinal care index *known*) and only 4 of 82 (4.9%) of patients who had not. These findings are similar to patient self-reported longitudinal care: deep patient-doctor relationships were present in 127 of 420 (30.2%) of patients who said they had seen the study GP previously. No deep relationships were observed among the 44 patients who said they had never seen the study GP before.

Table 8-13 Proportion and odds ratios (crude and adjusted) of *deep* patient-doctor relationship for longitudinal care indices *known* and *sequence*

		Deep patient-doctor relationship				
	n	% (95% CI)	Crude OR (95% CI) †	p ▲	Adjusted OR (95% CI) ‡	p ▲
Known						
Unknown	82	4.9 (1.3, 12.0)	1.0	<0.001	1.0	0.009
Known	395	31.7 (27.1, 36.5)	8.1 (3.0, 21.7)		4.8 (1.5, 15.6)	
Sequence						
No	212	15.6 (11.0, 21.1)	1.0	<0.001	1.0	0.071
Yes	265	36.2 (30.4, 42.3)	2.8 (1.8, 4.4)		1.8 (1.0, 3.3)	

† Longitudinal care index adjusted for time spanned by the continuity defining period
‡ Crude longitudinal care index adjusted for patient sociodemographic (age, sex, ethnicity, marital status, employment, education), patient health (disability, general health) and consultation (length, patient-doctor communication) characteristics
▲ LR χ^2 test

Table 8-13 shows the numbers and percentages of patients with a deep patient-doctor relationship and the crude and fully adjusted odds ratios of a deep patient-doctor relationship for the longitudinal care indices *known* and *sequence*. It shows that having consulted the study GP during the continuity defining period (*known* adjusted OR 4.8, 95% CI 1.5 to 15.6) was but consulting with the same doctor at the previous visit (*sequence* adjusted OR 1.8, 95% CI 1.0 to 3.3) was not associated with deep patient-doctor relationships.

For every one point increase in the *proportion* of consultations with the study GP (allowing for clustering by GP and adjusted for time spanned by the continuity defining period) the odds ratio of deep patient-doctor relationship was 1.03 (95% CI 1.02 to 1.03, p<0.0001). Again, a non-linear logistic regression model appeared to fit the data better (LR test p=0.027) so that the odds ratio of deep patient-doctor relationship by *proportion* in the fully adjusted analysis was 1.17 (95% CI 1.08 to 1.29, p<0.001).

8.3.4 Summary

An association was found between the primary longitudinal care index *count* and *deep* patient-doctor relationships even when adjusted for potential confounders. There was evidence that the relationship between the number of consultations and probability of *deep* relationship was curvilinear, with encounter-to-encounter increases in the probability of a *deep* relationship being highest with few consultations lowest with many consultations. This association did not appear to be modified by different standards of patient-doctor communication or the study GP's share of doctor encounters. In adjusted analyses, evidence for an association was seen between deep relationships and the secondary longitudinal care measures *known* and *proportion* but not *sequence*.

8.4 Patient-doctor continuity and GP detection of patient psychological distress

After comparing the general level of agreement between GP and GHQ (8.4.1), the aim of the rest of this section is to test the second study hypothesis (4.4.2) that patient-doctor continuity is associated with better GP detection of patient psychological distress. Continuity of patient care was primarily explored in terms of patient-doctor depth of relationship, but analyses are repeated in secondary explorations with continuity expressed as the longitudinal care indices *count, proportion, known* and *sequence*. As described in 7.6.2.2, "better GP detection" was operationalised mainly as an association between continuity and GP detection of psychologically distressed patients (GHQ cases) only (8.4.2). Supplementary analyses follow that explore the data in terms of GPs' accuracy (8.4.3): validity coefficients for groups of high and low levels of continuity are compared; and how GP report of distress varies with different levels of continuity and GHQ score severity is examined.

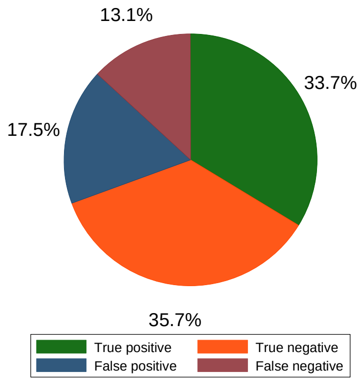
8.4.1 Overall agreement between GP and GHQ assessments

To reiterate, the overall prevalence of patient psychological distress was reported earlier (8.2.3.4.2) as being 51.0% (95% CI 46.5% to 55.6%) according to study GPs and 47.1% (95% CI 42.5% to 51.7%) according to the GHQ. By GP, the mean prevalence of psychological distress varied from 18.2% to 100.0% (GP cases) and 24.0% to 87.5% (GHQ cases).

The overall level of agreement between GP and GHQ assessment of patient distress (with respective thresholds for caseness of none/mild and 2/3 as used in the primary analysis) is shown in Figure 8-16. Where GP and GHQ data were available (n=457), GPs correctly identified 154 (33.7%, 95% CI 29.4% to 38.2%) of patients as GHQ cases and 163 (35.7%, 95% CI 31.3% to 40.3%) of GHQ non-cases. Doctors therefore misclassified 140 (30.6%, 95% CI 26.4% to 35.1%) of patients. Looking at GP detection by GHQ caseness, GPs identified 72.0% (95% CI 65.4% to 77.9%) of GHQ cases and 67.1% (95% CI 60.8% to 73.0%) of GHQ non-cases.

As discussed in the methods chapter (7.4.3.1.4 and 7.4.3.2.2), obviously agreement between GP and GHQ is affected by the thresholds chosen for both. Table 8-14 also compares the effect of alternative thresholds for GP and GHQ caseness on doctors' sensitivity, specificity, positive and negative predictive values and misclassification rates. With the GHQ case threshold of 2/3 and GP threshold of none/mild (shaded area), it can be seen that there is a reasonable balance between these figures. The table also shows GP sensitivity is higher and specificity lower with a GP threshold for caseness of none/mild rather than mild/moderate.

Figure 8-16 Congruence between GP assessment and GHQ cases
GP case threshold: none/mild. GHQ case threshold: 2/3.



Number (%) of patients			
GP case	**GHQ case**		**Total**
	No	Yes	
No	163 (35.7)	60 (13.1)	223 (48.8)
Yes	80 (17.5)	154 (33.7)	234 (51.2)
Total	243 (53.2)	214 (46.8)	457 (100.0)

Table 8-14 GP detection of patient psychological distress at different thresholds for GP and GHQ caseness
Validity coefficients (95% CI), n=457.

	Threshold for GP caseness	
Threshold for GHQ caseness	**None/ mild**	**Mild/ moderate**
2/3		
Sensitivity	72.0 (65.4, 77.9)	44.4 (37.6, 51.3)
Specificity	67.1 (60.8, 73.0)	88.5 (83.8, 92.2)
Positive predictive value	65.8 (59.3, 71.9)	77.2 (68.8, 84.3)
Negative predictive value	73.1 (66.8, 78.8)	64.4 (59.0, 69.5)
Overall misclassification	30.6 (26.4, 35.1)	32.2 (27.9, 36.7)
3/4		
Sensitivity	76.2 (69.4, 82.2)	49.2 (41.7, 56.7)
Specificity	65.2 (59.3, 70.8)	87.7 (83.2, 91.3)
Positive predictive value	59.0 (52.4, 65.3)	72.4 (63.6, 80.0)
Negative predictive value	80.7 (74.9, 85.7)	72.5 (67.3, 77.2)
Overall misclassification	30.4 (26.2, 34.9)	27.6 (23.5, 31.9)

8.4.2 GP detection of psychologically distressed patients

Analyses in this section are restricted to patients who were psychologically distressed according to the GHQ. The sample size calculation for this analysis was adjusted for clustering by GP, using an estimated intra-cluster correlation coefficient (ICC) of between 0.05 and 0.1 for GP detection of psychologically distressed patients by GP (7.7). The observed ICC was 0.09 (95% CI 0.00 to 0.20).

8.4.2.1 Primary analysis

This analysis explored whether GP detection of distress was associated with patient-doctor depth of relationship, using the GP caseness threshold of none/mild and the GHQ caseness threshold of 2/3. As explained earlier (7.6.2.2 and 8.2.5.3.2), the main analysis was performed using the continuous version of patient-doctor depth of relationship score.

The unadjusted odds ratio of GP detection of psychologically distressed patients was 1.04 (95% CI 1.00 to 1.08, p=0.045) for every point on the patient-doctor depth of relationship scale. Next the estimate was adjusted for other variables that may positively or negatively confound an association between patient-doctor depth of relationship and GP detection of psychologically distressed patients (see 8.2.5.3.3). As can be seen in Table 8-15, there was some evidence of confounding for patient health characteristics and consultation factors. (Associations between the potentially most important confounders and GP detection are shown in Table 8-19 and discussed in section 8.4.2.2.3.) After adjusting for all the factors listed in the table, for every point on the patient-doctor depth of relationship scale the odds ratio of GP detection of psychologically distressed patients was 0.95 (95% CI 0.87 to 1.02, p=0.161). In case characteristics of the doctor may have confounded any association, the depth of relationship-GP detection logistic regression model was also repeated with GP sex, age and psychological orientation (low/high) in the model. The odds ratio of detection did not change.

Table 8-15 Multivariable logistic regression analysis of patient-doctor depth of relationship and odds ratios of GP detection of patient psychological distress, adjusted for potential confounders
Per point on the depth of relationship scale, sample restricted to GHQ cases (GHQ threshold 2/3)

	Odds ratio of GP detection by patient-doctor depth of relationship (95% CI)	**N**
Model one: unadjusted	1.04 (1.00, 1.08))	210
Model two: adjusted for patient sociodemographic characteristics		
Sex	1.04 (1.00, 1.08)	210
Age †	1.06 (1.02, 1.10)	210
Marital status	1.04 (1.00, 1.08)	209
Employment	1.05 (1.01, 1.10)	208
Education	1.04 (1.01, 1.08)	203
All sociodemographic characteristics	1.05 (1.01, 1.10)	202
Model three: adjusted for patient health characteristics		
Disability	1.04 (1.00, 1.08)	210
Health	1.02 (0.98, 1.07)	210
GHQ score	1.02 (0.98, 1.08)	210
All health characteristics	1.02 (0.97, 1.07)	210
Model four: adjusted for consultation characteristics		
Length †	1.03 (1.00, 1.07)	204
Communication †	1.02 (0.98, 1.06)	209
Number of problems	1.05 (1.00, 1.10)	209
Emotional attribution	1.02 (1.00, 1.03)	202
All consultation characteristics	1.01 (0.95, 1.08)	194
Model four: adjusted for current mental health problem	1.01 (0.97, 1.06)	210
Model five: adjusted for all patient sociodemographic, patient health, consultation and current mental health problem variables	0.95 (0.87, 1.02)	189

† Entered as continuous variables

Odds ratios of GP detection in respect of the dichotomous *shallow/deep* version of the patient-doctor depth of relationship score were also calculated. The crude and adjusted odds ratios of *deep* compared with *shallow* patient-doctor relationship were 1.75 (95% CI 0.72 to 4.26) and 1.12 (95% CI 0.42 to 2.97) respectively.

8.4.2.2 Secondary exploratory analyses

These analyses explored whether GP detection of distress was associated with patient-doctor depth of relationship and longitudinal care using different threshold of GP (none/mild and mild/moderate) and GHQ caseness (2/3 and 3/4).

8.4.2.2.1 Patient-doctor depth of relationship

Table 8-16 shows the crude and adjusted odds ratios for GP detection of psychologically distressed patients by each point on the depth of relationship scale for the alternative GP and GHQ thresholds for caseness. It can be seen that depth of relationship was associated with GP detection of psychologically distressed patients with the higher GP and GHQ cut-offs (OR 1.14, 95% CI 1.02, 1.28, p=0.026), but not with any other combination of GP and GHQ threshold.

8.4.2.2.2 Longitudinal care

Adopting the same GP (none/mild) and GHQ (2/3) thresholds for caseness as used in the primary analysis, the odds ratios of GP detection of psychologically distressed patients were calculated for longitudinal care expressed as continuous (*count* and *proportion*) and binary (*known* and *sequence*) variables. None of these indices were associated with GP detection of psychologically distressed patients in either the unadjusted or adjusted logistic regression models (Table 8-17).

Next, the odds ratio of GP detection of psychologically distressed patients by longitudinal care (*count*) was estimated using the alternative GP and GHQ thresholds. As Table 8-18 shows, no association with any of the different permutations was found.

Table 8-16 Multivariable logistic regression analysis of patient-doctor depth of relationship and odds ratios of GP detection of psychological distress, using alternative GP and GHQ thresholds for caseness
Per point on the depth of relationship scale, sample restricted to GHQ cases (GHQ threshold 2/3 n=218, GHQ threshold 3/4 n=185)

	Odds ratio of GP detection by depth of relationship (95% CI)			
GHQ threshold	**2/3**		**3/4**	
	Crude	**Adjusted †**	**Crude**	**Adjusted †**
GP threshold				
None/mild	1.04 (1.00, 1.08)	0.95 (0.87, 1.02)	1.05 (1.00, 1.10)	0.98 (0.85, 1.13)
Mild/moderate	1.04 (1.01, 1.07)	1.09 (1.00, 1.19)	1.05 (1.02, 1.09)	1.14 (1.02, 1.28)

† Crude odds ratio adjusted for patient sociodemographic, patient health and consultation characteristics, and record of current mental health problem.

Table 8-17 Multivariable logistic regression analysis of longitudinal care and odds ratios (crude and adjusted) of GP detection of psychological distress
Sample restricted to GHQ cases(GHQ threshold 2/3)

	GP detection of psychologically distressed patient			
Longitudinal care index	Crude † OR (95% CI)	p ▲	Adjusted ‡ OR (95% CI)	p ▲
Count	1.07 (0.97, 1.17)	0.185	1.05 (0.91, 1.21)	0.523
Proportion	1.01 (1.00, 1.02)	0.060	1.01 (0.99, 1.02)	0.296
Known	1.99 (0.71, 5.61)	0.192	2.21 (0.69, 7.03)	0.180
Sequence	1.78 (1.07, 2.96)	0.025	1.37 (0.61, 3.08)	0.442

† Longitudinal care indices adjusted for time spanned by the continuity defining period
‡ Crude longitudinal care index adjusted for patient sociodemographic (age, sex, ethnicity, marital status, employment, education), patient health (disability, general health, GHQ score) and consultation (length, patient-doctor communication, number of problems, emotional attribution) characteristics, and record of current mental health problem.
▲ LR χ^2 test

Table 8-18 Multivariable logistic regression analysis of patient-doctor longitudinal care (*count*) and odds ratios of GP detection of psychological distress, using alternative GP and GHQ thresholds for caseness
Sample restricted to GHQ cases (GHQ threshold 2/3 n=218, GHQ threshold 3/4 n=185)

	Odds ratio of GP detection by longitudinal care (*count*) (95% CI)			
GHQ threshold	**2/3**		**3/4**	
	Crude †	**Adjusted ‡**	**Crude †**	**Adjusted ‡**
GP threshold				
None/mild	1.07 (0.97, 1.17)	1.05 (0.91, 1.21)	1.06 (0.94, 1.19)	1.08 (0.91, 1.28)
Mild/moderate	1.06 (1.01, 1.11)	1.07 (0.97, 1.17)	1.05 (1.00, 1.11)	1.08 (0.97, 1.19)

† *Count* adjusted for time spanned by the continuity defining period
‡ Crude odds ratio adjusted for patient sociodemographic, patient health and consultation characteristics, and record of current mental health problem.

8.4.2.2.3 Other significant factors

From previous studies of GP detection of psychologically distressed patients, the factors mostly strongly associated with identification have been patient symptom attribution, severity of distress, patient-doctor communication, consultation length and frequency of consultations (number of study GP consultations per year). In order to be able to compare this project with earlier research, the crude and adjusted odds ratios of GP detection for these factors in this study are presented in Table 8-19. This shows that the factors strongly associated with detection, after adjustment, are the patient attributing some or all of their problem to an emotional cause (adjusted OR 4.64, 95% CI 1.45 to 14.89) and the patient GHQ score (adjusted OR 1.35, 95% CI 1.18 to 1.54).

Table 8-19 Multivariable logistic regression analysis of other significant factors and odds ratios (crude and adjusted) of GP detection of psychological distress
Sample restricted to GHQ cases

	Odds ratio of GP detection (95% CI)	
Factor	Crude	Adjusted †
Patient symptom attribution	10.69 (4.13, 27.67)	4.64 (1.45, 14.89)
GHQ score	1.37 (1.25, 1.49)	1.35 (1.18, 1.54)
Communication score	1.02 (1.00, 1.04)	1.01 (0.99, 1.04)
Consultation length	1.07 (0.99, 1.15)	1.08 (0.97, 1.21)
Number of study GP consultations per year	1.08 (0.98, 1.21)	1.02 (0.88, 1.19)

‡ Crude odds ratio adjusted for patient sociodemographic, patient health and consultation characteristics, and record of current mental health problem.

8.4.3 Accuracy of GP assessments of psychological distress

Analyses in this section relate to all patients on whom data on patient-doctor continuity (depth of relationship or longitudinal care) and levels of psychological distress (GP assessment and GHQ score) were available. For this reason, the figures for overall proportion of GP and GHQ cases and validity coefficients differ slightly from that presented earlier (8.4.1).

8.4.3.1 Patient-doctor depth of relationship

Analyses were conducted exploring how GP report of patient psychological distress compared first between patients with *deep* and *shallow* relationships (GHQ threshold 2/3), and second how it varied with depth of relationship and GHQ score. This was done first for GP caseness threshold of none/mild, and repeated for the alternative mild/moderate cut-off.

8.4.3.1.1 GP threshold for caseness: none/mild

Table 8-20 shows how patients with *deep* and *shallow* relationships compared in terms of percentage of GP and GHQ cases, validity coefficients and percentage of overall misclassification. Whilst the number of GHQ cases were similar between the *deep* and *shallow* groups of patients (*shallow* 45.2% versus *deep* 51.2%, χ^2=1.29, p=0.257), there were more GP cases in patients with *deep* than *shallow* patient-doctor relationships (*shallow* 47.1% versus *deep* 61.2%, χ^2=7.50, p=0.006). It also appears that GP sensitivity was higher and specificity was lower in the *deep* relationship group. The overall misclassification rates were similar though (*shallow* 30.3% versus *deep* 33.1%, χ^2=0.31, p=0.575). Next, Table 8-21 shows how patients with *deep* and *shallow* relationships compared with respect to the proportion of GP cases by GHQ caseness. Again, it appears that GPs report more cases amongst those patients with *deep* patient-doctor relationship whether they are a GHQ case or not. However, evidence of a difference between *shallow* and *deep* relationships was strongest for GHQ non-cases (χ^2=5.56, p=0.018) rather than among GHQ cases (χ^2=2.49, p=0.114).

This observation was explored in more detail using depth of relationship and GHQ score as continuous explanatory variables in a logistic regression model with GP report as the outcome. The crude odds ratios of GP report with increasing depth of relationship and GHQ score were 1.04 (95% CI 1.01 to 1.07, p=0.004) and 1.34 (95% CI 1.24 to 1.45, p<0.001) respectively. The odds ratio of GP report with increasing depth of relationship adjusted for GHQ score was 1.03 (95% CI 1.00 to 1.07, p=0.068). Comparing logistic regression models with and without an interaction term for depth of relationship and GHQ score, there was no evidence of any effect modification (p=0.980, LR test). This supports the above finding that GP report of patient distress was associated with depth of relationship, independent of the actual level of psychological symptoms according to the GHQ.

8.4.3.1.2 GP threshold for caseness: mild/moderate

Table 8-22 is equivalent to Table 8-20, only comparing indices for patients with *shallow* and *deep* patient-doctor relationships with the alternative GP detection threshold of mild/moderate. As expected, overall there are fewer GP cases (GP case threshold mild/moderate 26.8%, none/mild 51.0%), but there is now no difference in the proportion of GP cases between the shallow and deep groups (*shallow* 25.6% versus *deep* 29.5%, χ^2=0.73, p=0.394). The proportion of GHQ cases in the shallow and deep groups are of course unchanged (*shallow* 45.2% versus *deep* 51.2%, χ^2=1.29, p=0.257). Compared with Table 8-20 for the none/mild cut-off for GP caseness, sensitivity and specificity in deep and shallow patient groups are more similar.

Table 8-20 Levels of psychological distress in patients and GP detection accuracy by *shallow/deep* patient-doctor relationship
Comparison of percentage GP cases and GHQ cases, validity coefficients and percentage of overall misclassification. GP threshold for caseness: none/mild; GHQ threshold for caseness: 2/3.

	Overall % (95% CI)	**Patient-doctor relationship** % (95% CI)	
		Shallow	**Deep**
n	451	330	121
Psychological distress			
GP case	51.0 (46.3, 55.7)	47.1 (41.8, 52.5)	61.2 (52.3, 69.7)
GHQ case	46.6 (41.9, 51.3)	45.2 (39.8, 50.7)	51.2 (42.0, 60.4)
Validity coefficients			
Sensitivity	71.4 (64.8, 77.4)	68.2 (60.0, 75.6)	79.0 (66.8, 88.3)
Specificity	66.8 (60.5, 72.7)	70.9 (63.7, 77.4)	54.2 (40.8, 67.3)
Positive predictive value	65.2 (58.7, 71.4)	65.6 (57.5, 73.0)	64.5 (52.7, 75.1)
Negative predictive value	72.9 (66.5, 78.6)	73.3 (66.1, 79.7)	71.1 (55.7, 83.6)
Overall misclassification	31.0 (26.8, 35.5)	30.3 (25.4, 35.6)	33.1 (24.8, 42.2)

Table 8-21 Proportion of GP cases of psychologically distressed patients by GHQ caseness and *shallow/deep* patient-doctor relationship
GP threshold for caseness: none/mild; GHQ threshold for caseness: 2/3.

Patient-doctor depth of relationship	**% GP cases (95% CI)**		
	Overall	**GHQ case**	
		No	Yes
Shallow	47.1 (41.8, 52.5)	29.1 (22.6, 36.3)	68.2 (60.1, 75.6)
Deep	61.2 (52.3, 69.7)	45.8 (32.7, 59.2)	79.0 (66.8, 88.3)

Misclassification rates were also similar among patients with *deep* (34.7%) and *shallow* (31.2%) relationships (χ^2=0.50, p=0.481). Although there appears to be slightly more GP cases among those patients with *deep* relationships (Table 8-23), evidence of any difference between deep and shallow groups by GHQ caseness (GHQ non-cases χ^2=1.01, p=0.316; GHQ cases χ^2=0.22, p=0.638) was weak.

Logistic regression analysis was repeated with GP report of distress as the outcome and patient-doctor depth of relationship adjusted for GHQ score as the explanatory variable, using the alternative mild/moderate GP threshold for caseness. The odds ratio of GP report with increasing GHQ-adjusted depth of relationship was 1.02 (95% CI 0.99 to 1.06, p=0.115). Again, there was no evidence of an interaction between depth of patient-doctor relationship and GHQ score (p=0.294, LR test).

Table 8-22 Levels of psychological distress in patients and GP detection accuracy by *shallow/deep* patient-doctor relationship (alternative GP detection threshold)
Comparison of percentage GP cases and GHQ cases, validity coefficients and percentage of overall misclassification. GP threshold for caseness: mild/moderate; GHQ threshold for caseness: 2/3.

	Overall % (95% CI)	**Patient-doctor relationship** % (95% CI)	
		Shallow	**Deep**
n	451	330	121
Psychological distress			
GP case	26.8 (22.8, 31.2)	25.6 (21.1, 30.5)	29.5 (21.8, 38.1)
GHQ case	46.6 (41.9, 51.3)	45.2 (39.8, 50.7)	51.2 (42.0, 60.4)
Validity coefficients			
Sensitivity	44.3 (37.5, 51.3)	43.2 (35.1, 51.6)	46.8 (34.0, 59.9)
Specificity	88.4 (83.6, 92.1)	89.6 (84.2, 93.6)	84.7 (73.0, 92.8)
Positive predictive value	76.9 (68.3, 84.0)	77.1 (66.6, 85.6)	76.3 (59.8, 88.6)
Negative predictive value	64.5 (59.1, 69.7)	66.0 (59.7, 71.9)	60.2 (48.9, 70.8)
Overall misclassification	32.2 (27.9, 36.7)	31.2 (26.2, 36.5)	34.7 (26.3, 43.9)

Table 8-23 Proportion of GP cases of psychologically distressed patients by GHQ caseness and *shallow/deep* patient-doctor relationship
GP threshold for caseness: mild/moderate; GHQ threshold for caseness: 2/3.

Patient-doctor depth of relationship	**% GP cases (95% CI)**		
	Overall	**GHQ case**	
		No	Yes
Shallow	25.6 (21.1, 30.5)	10.4 (6.4, 15.8)	43.2 (35.1, 51.6)
Deep	29.5 (21.8, 38.1)	15.3 (7.2, 27.0)	46.8 (34.0, 59.9)

8.4.3.2 Continuity: longitudinal care

As in section 8.4.3.1, analyses were conducted exploring how GP report (none/mild threshold) compared first between *known* and *unknown* patients (GHQ threshold 2/3), and second how it varied with longitudinal care (*count*) and GHQ score.

Table 8-24 is the same as the table constructed for *shallow/deep* relationship (Table 8-20) but with figures comparing different longitudinal care groups, as defined by the longitudinal care index *known*. A greater proportion of patients *known* to the doctor during the continuity defining period were both GP (*unknown* 31.0% versus *known* 55.6%, χ^2=16.81, p<0.001) and GHQ (*unknown* 33.3% versus *known* 50.4%, χ^2=7.79, p=0.005) cases. Similarly it appears that GP sensitivity was higher and specificity was lower in the *known* group. The overall misclassification rates were similar though (*unknown* 23.5% versus *known* 31.8%, χ^2=2.19, p=0.139). Table 8-25 (whose depth of relationship counterpart is Table 8-21) shows the percentage of GP cases of psychologically distressed patients by GHQ caseness and whether the patient was *known* or *unknown*. GPs appeared to be more likely to identify a patient as a case if they were also a case on the GHQ, but once again GP identification rates between *unknown* and *known* patients differed among GHQ non-cases (*unknown* 14.8% versus *known* 37.8%, χ^2=10.08, p=0.002) and not GHQ cases (*unknown* 59.3% versus *known* 74.2%, χ^2=2.63, p=0.105).

A logistic regression model was run with GP report of patient psychological distress as the outcome and the longitudinal care index *count* adjusted for GHQ score as the explanatory variable. The odds ratios of GP report with increasing *count* unadjusted and adjusted for GHQ score were 1.16 (95% CI 1.10 to 1.23, p<0.001) and 1.13 (95% CI 1.04 to 1.22, p=0.004) respectively. Comparing logistic regression models with and without an interaction term for *count* and GHQ score, there was weak evidence of any effect modification (LR test p=0.159). This also supports the finding that GP report of patient distress was associated with longitudinal care independent of the actual level of psychological symptoms according to the GHQ.

Table 8-24 Levels of psychological distress in patients and GP detection accuracy by patient-doctor longitudinal care (*unknown/known*)
Comparison of percentage GP cases and GHQ cases, validity coefficients and percentage of overall misclassification. GP threshold for caseness: none/mild; GHQ threshold for caseness: 2/3.

	Overall % (95% CI)	**Longitudinal care** % (95% CI)	
		Unknown	**Known**
n	452	81	371
Psychological distress			
GP case	51.3 (46.6, 56.0)	31.0 (21.3, 42.0)	55.6 (50.5, 60.6)
GHQ case	47.1 (42.4, 51.8)	33.3 (23.2, 44.7)	50.4 (45.2, 55.6)
Validity coefficients			
Sensitivity	72.3 (65.8, 78.2)	59.3 (38.8, 77.6)	74.2 (67.3, 80.3)
Specificity	67.4 (61.0, 73.3)	85.2 (72.9, 93.4)	62.2 (54.8. 69.2)
Positive predictive value	66.4 (59.9, 72.4)	66.7 (44.7, 84.4)	66.3 (59.5, 72.7)
Negative predictive value	73.2 (66.8, 78.9)	80.7 (68.1, 90.0)	70.6 (62.9, 77.4)
Overall misclassification	30.3 (26.1, 34.8)	23.5 (14.8, 34.2)	31.8 (27.1, 36.8)

Table 8-25 Proportion of GP cases of psychologically distressed patients by GHQ caseness and longitudinal care (*unknown/known*)
GP threshold for caseness: none/mild; GHQ threshold for caseness: 2/3.

Longitudinal care	**% GP cases (95% CI)**		
	Overall	**GHQ case**	
		No	Yes
Unknown	31.0 (21.3, 42.0)	14.8 (6.6, 27.1)	59.3 (38.8, 77.6)
Known	55.6 (50.5, 60.6)	37.8 (30.8, 45.2)	74.2 (67.2, 80.3)

8.4.4 Summary

In the primary analysis (GP threshold for caseness none/mild; GHQ threshold for caseness 2/3), patient-doctor continuity, whether expressed as depth of relationship or longitudinal care, was not found to be associated with GPs identifying more psychologically distressed patients. In the secondary analyses, patient-doctor depth of relationship was associated with detection at the higher GP (mild/moderate) and GHQ (3/4) thresholds for caseness. However, regardless of the thresholds chosen for GP or GHQ caseness, seeing the same doctor appeared to be associated with over-reporting of patient distress.

9. Discussion

9.1 Introduction

This chapter begins by reviewing the key findings presented in the previous chapter. After considering some of the project's general strengths and limitations, it goes on to address the issues that specifically relate to the two study hypotheses. It finishes by summarising what this thesis adds to our understanding of patient-doctor longitudinal care and depth of relationship, and patient-doctor continuity and GP detection of patient psychological distress.

9.2 Summary of findings

9.2.1 Patient-doctor longitudinal care and depth of relationship

The majority of patients had consulted with the study GP previously: 89.8% of patients said they had seen the doctor before and according to the medical records 82.6% of patients encountered them at least once during the continuity defining period (longitudinal care index *known*). Patient-doctor depth of relationship scores were highly negatively skewed (median 26, IQR 19 to 32), so that over a quarter of patients (26.7%) had a *deep* relationship, which was defined as the maximum score on the depth of relationship scale.

The presence of a deep patient-doctor relationship was associated with longitudinal care, expressed either as the number of the patient-study GP consultations (primary longitudinal care index *count*), the proportion of doctor consultations with the study GP or having seen the doctor during the continuity defining period (secondary longitudinal care indices *proportion* and *known* respectively). The relationship between the number of consultations and probability of a deep relationship appeared to be non-linear, so that a plateau was reached at around 18 encounters (Figure 8-15). However, it was not found to vary with the doctors' communication skills or the *proportion* of doctor consultations that were with the study GP. Seeing the same doctor at two consecutive appointments (*sequence*) was not associated with deep patient-doctor relationships.

9.2.2 Patient-doctor continuity and GP detection of patient psychological distress

In the primary analysis, doctor identification of psychologically distressed patients was not shown to be associated with patient-doctor continuity, in either depth of relationship (OR 0.95, 95% CI 0.87 to 1.02, p=0.161) or longitudinal care (Table 8-17) terms. Exploratory analysis using alternative cut-offs for GP and GHQ caseness found an association between depth of relationship and detection (Table 8-16) with a GP threshold of mild/moderate and a GHQ threshold of 3/4. No such association was found with the longitudinal care index *count* (Table 8-18). However, further analysis suggested that whatever the threshold for GP caseness, patient-doctor continuity (depth of relationship and longitudinal care) was linked to GPs being more likely to label a patient as distressed independent of their actual level of distress according to the GHQ.

9.3 General strengths and limitations

9.3.1 Originality

Other than the development of the patient-doctor depth of relationship questionnaire itself, there are two original elements to the main study. The first empirically tests the hypothesis that seeing the same doctor is associated with a depth of relationship. Several studies have investigated the relationship between longitudinal care and knowledge, and longitudinal care and trust (3.2.2.2), but there are no studies known to the author that have looked for an association between longitudinal care and depth of relationship. The second original element looks for an association between continuity and GP detection of patient psychological distress. There is a significant literature on doctor identification of patient psychological distress or psychiatric illness, but few investigations of the potential influence of continuity (3.3.2). Those known to the author have investigated continuity in terms of duration of patient-doctor relationship, patient-physician familiarity (including "being known") and personal doctoring. Related studies have looked at the influence of consultations over time. This is the first study that the author is aware of that examines and compares detection in longitudinal care and depth of relationship dimensions.

9.3.2 Patient-doctor longitudinal care, consultations, and depth of relationship model

A major strength of this thesis is that it is underpinned by a conceptual model that distinguishes between the elements of longitudinal care, consultations and depth of relationship (3.2.2). The origin of the model is the commonly accepted belief that seeing the same doctor builds a patient-doctor relationship. Using a qualitative synthesis technique, the author previously found support in the patient literature for this axiom and described influences on, and the composition of, patient-doctor depth of relationship.[143] An explicit framework was proposed by which the value of different components of patient-doctor relationships can be explored.

The study hypotheses, the patient-doctor depth of relationship questionnaire, and the main study design are all based on this framework:

- The model has been used to look for associations between: longitudinal care and patient-doctor depth of relationship; and patient-doctor continuity (in depth of relationship and longitudinal care terms) and GP detection of patient psychological distress.

- The patient-doctor depth of relationship instrument is a novel attempt to quantify the characteristics of on-going patient-doctor relationships. Many of the existing patient-doctor relationship questionnaires either: focus on satisfaction or doctors' communication and interpersonal skills; restrict themselves to one specific aspect of continuing relationships such as trust; or feature items that form one scale on a much larger questionnaire.

- The main study was designed to capture as much information about individual patient-doctor relationships, and hence potential confounders in an association between longitudinal care and depth of relationship, as possible.

Nonetheless, the following limitations regarding the decision to adopt and apply this model should be acknowledged. First, describing continuity and patient-doctor relationships in terms of these different elements represents only one way of interpreting the literature and this model has not been tested before. Second, the original model proposed included factors that may affect depth of relationship yet are difficult to measure and account for, for instance the doctor treating the patient for a significant illness. For the "consultations" part of the model the theoretically most important factors, communication skills and consultation length, were considered.

9.3.3 Patient-doctor depth of relationship scale

Patient-doctor depth of relationship was measured using a new eight item patient self-complete questionnaire that was developed for the express purpose of examining this dimension of continuity. It was founded on the longitudinal care, consultations and depth of relationship model of continuity and it comprises items based on the different depth of relationship elements of knowledge, trust, loyalty and regard.[143] These were tested in face-to-face interviews and selected through two pilot rounds before being used in the main study (chapter 6). The characteristics of the questionnaire described during its development (high internal reliability and single scale) were confirmed in the main study (section 8.2.5.3.1).

As discussed in chapter 5 (section 5.5), although the development of questionnaires and scales can be aided by psychometric techniques, the process of devising and revising a new instrument is still as much an art as a science.[320] The issues of how appealing and easy the questionnaire is to complete (and hence response rate and selection bias) and the question items' face validity are key. No amount of statistical manipulation at the analysis stage can compensate for a badly laid out questionnaire or poorly worded question item.[325] Care was taken throughout the conceptualisation and piloting of the draft questionnaire to pay close attention to these fundamentals. The main study is the first time it has been used, so there are no other data for comparison.

A biased five point response scale (disagree, neutral, slight agree, mostly agree or totally agree) was purposefully chosen to try and obtain a spread of opinion but despite this the scaled depth scores were highly negatively skewed. This may be a true finding, so that like the high satisfaction levels usually observed with patient satisfaction questionnaires,[150;385] many patients may simply have deep relationships with their doctors. Alternatively, this may be a "ceiling effect" that reflects a limitation of the questionnaire. That is, the scale may be poor at discerning between different depths of relationship, particularly at the deeper end. It is also possible that patients are reluctant to be critical of their doctors in any sense, including how they rate their knowledge of them and so on.

The depth of relationship questionnaire was developed in eight practices that went on to take part in the main study, so it may perform differently in other populations. In addition, other characteristics have yet to be described, for instance its test-retest reliability. Referring back to the second pilot round during the development of the depth of relationship questionnaire, it is noteworthy that 27.9% of respondents admitted to completing the depth of relationship items before seeing the doctor, and that of those 70.3% said they were seeing their "usual or regular doctor". Whilst on the one hand this might reflect a greater confidence among patients about their relationship with a familiar doctor (the depth of relationship score may become more stable), it also highlights some patients' (29.7%) willingness to make judgements without seeing the doctor first.

Finally, two broader questions about the concept of "depth of relationship" need to be addressed. First, do patients distinguish between the content of individual consultations and on-going aspects of relationships? As discussed earlier (3.2.1.1), such a distinction has been proposed before, but research in the area is limited. Second if depth of relationship is a unique concept, does the patient-doctor depth of relationship questionnaire measure it? That is, has an association between longitudinal care and depth of relationship been truly demonstrated, or has longitudinal care in fact been linked with some other concept?

To answer the first question, particular attention was paid during the questionnaire's development to select question items that asked about on-going aspects of relationships rather than individual consultations, specifically patient-doctor communication. A degree of overlap between these concepts may be unavoidable, but the results suggest the communication and depth of relationship items measured different constructs. Using data from the main study, principal factor analysis of the eight depth and eight GPAQ communication items identified two factors that loaded on the depth and communication items respectively (see Table 11-7, Appendix 11.2), confirming an observation made during the depth of relationship questionnaire development.[386]

In respect of the second question, proof of the hypothesis that longitudinal care was associated with deep patient-doctor relationships also demonstrates construct validity for the questionnaire. The development of the questionnaire was justified on the grounds that no comparable "global" instrument measuring depth of relationship had been published, so criterion validity could not be tested. However, "divergent" validity is just as important – do the depth of relationship items measure a construct different from that of other instruments? Further studies will be required to compare the patient-doctor depth of relationship questionnaire with other instruments, such as the CARE empathy scale,[367] and to see whether depth of relationship is distinct from patient satisfaction. Validity cannot be confirmed by the findings of a single study, but "depends on repeated tests which are interpreted in the light of a defined theory underlying the contents of the questionnaire."[387]

9.3.4 Recruitment

Recruitment of practices, doctors and patients were satisfactory. Only three of the 34 practices who were approached declined, and of the practices who responded positively all of the study GPs initially identified took part.

Patients were approached over the course of two or three sessions, agreed with the study GP. Ideally surgeries would have been randomly selected, but data were collected at clinics held at different times and on different days of the week, and there is no reason to suppose the timing of the appointment mattered for this study. Of the eligible patients, 84.1% returned a questionnaire. The number of patients who took part and the amount of missing data were reduced by the presence of a researcher at every study surgery.

Although patients who took part in the study were generally similar to those who did not, participants (eligible patients who returned the questionnaire completed with consent to access their medical records) were better known to study GPs (8.2.1.3). The possible implications of non-response bias on the findings are discussed later (9.4.1.3 and 9.5.1.3).

9.3.5 Data collection

Data collected were generally complete and of adequate quality. Any problems with the data should have occurred randomly. This means that any differences observed should not have arisen just because there were more inaccurate or missing data in one group than another. For example, all data were extracted from the notes by the author so whilst transcription errors are possible, systematic bias in favour of patients with deep relationships was unlikely because he was blind to other patient data already collected.

9.3.5.1 Study surgery data

There were no missing data on patient age, sex and eligibility for the 832 face-to-face appointments that were booked during 68 study surgeries, 79.1% of patient respondent questionnaires were completed in full[d] and doctors answered all three study surgery form questions for 98.3% of eligible visits. Data on the accuracy of the duration of consultations were dependent on GPs correctly marking the start and end of encounters, and 14 very short or long consultations were treated as being of unknown length. The study GPs provided an assessment of psychological state for 98.4% of eligible patients (8.2.2.2).

9.3.5.2 Electronic medical record data

90.6% of respondents gave permission to review of their medical records, from which patient longitudinal care and mental health data were obtained. With the exception of six individuals who had had no previous consultations with a doctor at their practice, the five different types of longitudinal care measure (*count, known, sequence, proportion* and UPC) could be calculated for 98.8% of these patients. Alternative sources of this information and the advantages and disadvantages of using routine medical record data were discussed in the methods chapter (7.3.4.1). Doctors' concerns about medico-legal challenges and practice policies (the majority of practices – 29 out of 31 – said all consultations were recorded on the computer) mean one can be reasonably confident the electronic medical record represents an accurate record of the number of patients' attendances and types of problems.

As previously highlighted (7.3.4.2), in the continuity research field there is no consensus about the quantity and type of data required to calculate indices of longitudinal care. It was therefore decided to adopt the following consistent approach. First, the amount of data collected was restricted to the continuity defining period (7.3.4.2.3). Consequently, one cannot be sure how many

[d] Patient respondents answered all items in part one of the questionnaire and completed sufficient items in part two to permit calculation of patient-doctor communication and depth of relationship scores.

encounters a patient had with the doctor outside of the continuity defining period. By virtue of how the data were collected (and assuming that the electronic medical records were an accurate and complete account of patient encounters), one can only be confident that the number of previous patient-study GP contacts is complete for the 47 (9.6%) participants who had fewer than ten encounters in the previous 12 months; additional information on the size of this issue can be gained by comparing electronic medical record data with patient self-report (8.2.4.3.1). Second, encounters with an unidentified healthcare professional were coded using the same unknown doctor or unknown nurse label (7.3.4.2.3). Third, as done in previous studies, calculation of the longitudinal care indices did not take account of the types or interval between each patient-doctor encounter: all were included and treated equally. However, consultation *count* was adjusted for amount of time between the index and oldest patient-study GP consultation (7.6.2.1), thereby adjusting for the inter-patient variation in the period over which patients' encounters with doctors occurred. The possible implications of these decisions for the findings are discussed later (9.4.1.3.1).

Only 21 (4.3%) of patients had more than 11 encounters with the study GP, so inferences beyond this point about associations between longitudinal care and deep relationships or detection of psychological distress should be made with caution.

9.3.6 Analysis

The sample size calculation and all logistic regression analyses took account of clustering by doctor. The observed level of clustering for GP detection by GP (ICC 0.09) was within the expected range of between 0.05 and 0.10. Possible confounding factors were measured and adjusted for in multivariable quadratic logistic regression models. A limited number of pre-determined interactions were explored.

Alternative ways of approaching the data may however have provided additional insights. For the longitudinal care-depth of relationship analysis, instead of dichotomising the data into deep and shallow groups for the purposes of logistic regression, either linear regression analysis could have been performed on patients with less than maximal score, or three or more categories of patient-doctor relationship (for example shallow, medium and deep) could have been created and ordinal logistic regression undertaken. Similarly, by grouping patients into different levels of GHQ distress instead of labelling patients as cases or non-cases, ordinal logistic regression could have been used to provide a more detailed examination of the relationship between patient-doctor continuity and GP detection of psychologically distressed patients.

9.3.7 Reflexivity

The author is a GP with clinical experience of the influence of continuity and discontinuity on consultations in general practice and consequently the design and conduct of the study may have been shaped by his professional and personal opinion of its value. Nevertheless, it is hard to see how he could have directly influenced patients' and doctors' responses, and he strived to maintain an objective and neutral approach during all stages of the project. This was aided by discussions with his supervisors and external advisors.

9.4 Patient-doctor longitudinal care and depth of relationship

First, reasons why the association between longitudinal care and deep patient-doctor relationships may not be a true finding are explored. Next, the results are interpreted in the light of the study design and the existing literature. This section ends by considering the generalisability of the findings.

9.4.1 Possible explanations for findings

Possible explanations for why a difference was found when in reality none exists are discussed under the headings of chance, confounding, bias and interactions.

9.4.1.1 Chance

Deep patient-doctor relationships were found to be associated with longitudinal care expressed in both the primary (*count* adjusted OR in the non-linear model 1.5, 95% CI 1.2 to 1.8) and secondary analyses (*proportion* adjusted OR 1.2, 95% CI 1.1 to 1.3, *known* adjusted OR 4.8, 95% CI 1.5 to 15.5). Robust standard errors were used to take into account the effect of clustering by doctor. There was therefore strong statistical evidence that despite clustering this was not a chance observation.

9.4.1.2 Confounding

The importance of adjusting for possible confounding variables was discussed in the methods chapter (7.6.1.2.3). To recap, confounding occurs when an association between an exposure and an outcome is explained by a third factor that is both associated with the exposure and a risk factor for the outcome of interest.[388]

In bivariate analysis, the data were initially examined for factors that might confound an association between patient-doctor longitudinal care and deep relationship (Table 8-7 and Table 8-8). However, as previously discussed, whilst variables may not individually exhibit strong confounding, collectively confounding can be present in the data. For this reasons all variables that may in theory or have been previously shown to be confounders were included in the logistic regression model. Nevertheless, there was little evidence of confounding when the analysis was adjusted for individual, groups or all the possible confounders (Table 8-12). It is possible that the association between *count* and deep relationship may still be due to residual confounding, but there are no obvious candidate variables that should have been included in the analysis.

9.4.1.3 Bias

Bias refers to any systematic error in the design, conduct or analysis of a study which results in a conclusion that is different from the truth.[388] Bias can affect the results in two ways. If the study population are not representative of the population then the external validity of the findings may be challenged, i.e. the results may not be generalisable (see 9.4.3). This section discusses the case of bias causing problems with the internal validity of the study: whether the groups being compared on continuity are similar in other respects. The two main variables of interest in this respect are patient-doctor longitudinal care and depth of relationship.

9.4.1.3.1 Patient-doctor longitudinal care

A number of the decisions made about how the patient-doctor longitudinal care data were collected could be challenged (9.3.5.2). For example, it could be argued that more weight should be given to one type of encounter (for instance, home visit) than another (telephone perhaps), the implicit assumption being that different types of patient-doctor encounter contribute equally to the development of a depth of relationship. Whilst this supposition deserves to be tested, it was not an aim of this study and it is difficult to see how this or any of other issues pertaining to longitudinal care data could have biased the results. If patients had seen an unidentified doctor more than once during the continuity defining period, and they had seen different doctors yet the entries were coded with the same "unknown doctor" identifier, the recorded number of doctors seen will have been lower than was true and the patient's UPC statistic may have been affected. Despite this, because the absolute number of study and non-study doctor consultations is correct this does not affect the longitudinal care measures *count*, *known* or *sequence*, and therefore did not affect the longitudinal-depth of relationship analysis.

Nuances in how practices operate may have influenced the longitudinal care data. For example, measures of patient-continuity longitudinal care may be artificially elevated at practices where same-day surgery or visit requests are triaged by telephone. That is, the duty doctor speaks to all patients first on the telephone to decide if a face-to-face appointment is necessary and if so arranges to see them him/herself later that day. Because telephone and surgery appointments are treated equally, and the summary longitudinal measures employed do not try to take account of the interval between individual appointments, patients who are seen by the triage doctor are recorded as seeing the same doctor for two consecutive consultations, when in fact it may be more appropriate to treat the two contacts as a single encounter. Once again though, there is no reason to suspect that this differed between patients with deep and shallow relationships, so the findings are unlikely to have been affected.

9.4.1.3.2 Patient-doctor depth of relationship

The adoption of a *shallow/deep* threshold of 31/32 (8.2.5.3.2) gave the most conservative estimate possible of an association between patient-doctor longitudinal care and deep relationships. A lower threshold would have given higher crude odds ratios (see 8.3.2.1), but alternative cut-offs were considered (Table 8-9) and the alternatives did not appear to select a significantly different sample in terms of key patient characteristics that might have biased the results.

It was noted earlier that whilst patients who took part in the study were similar in most respects to those who did not, participant patients were better known to study GPs the non-participants (8.2.1.3). By definition no data were available on patient-doctor depth of relationship for non-participants, but the findings could have been affected were there a similar difference between patients who took part and those who did not. That is, if non-participants had similar levels of patient-doctor longitudinal care but lower depth of relationship scores, the association between longitudinal care and deep relationships may have been over-estimated.

9.4.1.4 Interactions

Regression models including the effect of two or more exposures make the assumption that there is no interaction between the exposures. Failure to identify and incorporate interaction(s) in a multivariable model can result in poor model fit and misinterpretation of data. For this reason, two theoretically important interactions between *count* and communication skills, and *count* and *proportion* were explored (8.3.2.3). No evidence for either was found but it must be remembered that investigations of this nature are effectively a type of a sub-group analysis, for which this study was not specifically powered.

One possible interaction that was not examined was that between longitudinal care and choice of doctor. If free choice of doctor were not available, one could hypothesise that two groups of patients, and hence two associations, between longitudinal care and depth of relationship might be present. The first group might comprise patients who have a free choice of doctor, and choose to see the study GP because their encounters with him/her are satisfactory. Consequently, over a series of visits, a deep patient-doctor relationship is established. The second group could consist of patients who are perhaps registered with a single-handed practice or one that operate a strict personal list system, and are therefore forced to see a GP with whom consultations are unsatisfactory. As a result, although they had longitudinal continuity with that doctor, the relationship did not deepen with time, and no association between longitudinal and deep patient-doctor relationships might be observed. Unfortunately patient choice of doctor was not measured in this study. None of the GPs in this study worked in solo practices, but four doctors worked in surgeries that were said to operate personal lists, and other local factors may have restricted which doctor patients saw. It is therefore likely that some participants may fall into the second, enforced longitudinal care group, which would have the effect of weakening the longitudinal care-deep patient doctor relationship association observed. On the other hand, study GPs' mean communication score were above the national average and no interaction in the logistic regression model between longitudinal care, GPAQc and deep patient-doctor relationships was seen. Indeed, 364 (75.7%) of patients reported a "very good" or "excellent" overall relationship with the study GP. These factors, proxies for satisfactory consultations, suggest that in general the standard of GPs recruited to this study was uniformly good and choice of doctor might therefore not have been a significant issue in this study.

9.4.2 Interpretation of findings

If the findings are true, then their meaning should be interpreted in the light of the limitations of the study study and the existing literature.

9.4.2.1 Study design

The advantages of cross-sectional studies are that they are quick and relatively cheap way to explore hypotheses. The main disadvantage of this method is that it only explores associations and causality cannot be determined. Whilst the author has argued that longitudinal care leads to depth of relationship, the association may in fact be the other way around. Both explanations are plausible and it would be surprising if elements of both were not present. Patient loyalty to seeing the same doctor may increase over the course of a series of consultations, but presumably (and assuming the patient has choice over who they see) it must be present after the initial visit, even if only as a willingness to consult with the same physician

In addition, it has not been possible to test the assumption (implicit in the longitudinal care, consultations and depth of relationship model) that patient-doctor relationships deepen with each encounter. Such an encounter-by-encounter increase in depth of relationship has not been established – only the probability of there being a deep relationship with increasing number of consultations. To illustrate this point, consider a patient with a depth of relationship score of 95 at the index consultation, who had had five previous consultations with the study GP during the continuity defining period. Without serial depth of relationship scores for every consultation, one cannot be certain whether the patient would have answered the depth of relationship questionnaire in the same way at consultation one or the maximum score was achieved after say three encounters, with a slightly lower score at the index consultation. However, the binary indices of longitudinal care provide some evidence of there being an incremental link between the numbers of patient-doctor consultations and increasing depth of relationship (8.3.3). Deep relationships were present in 30.2% of patients who reported seeing the study GP before and in 31.7% of patients that had encountered the study GP during the continuity defining period (*known* index). In contrast, deep relationships were present in none of the patients who said they had not seen the study GP before and in only 4.9% of patients *unknown* to the doctor. Recalling that patients were asked to complete the depth of relationship scale after their appointment, if deep relationships could be established in a single (i.e. index) consultation, one would have expected there to be some deep relationships observed amongst those patients who had not seen the study GP before. In addition, these observations suggest that a minimum of two encounters with the same doctor (the index and one previous) is not sufficient, otherwise the numbers of patients with deep relationships would be higher among those who had seen the study GP at least once before.

Alternative study designs would have been either a randomised controlled trial (RCT) where patients are randomly allocated to always see the same doctor or not, or a cohort study where patients are followed-up longitudinally. Both of these approaches would have required more time and resources than were available to the author; it would not have been possible to undertake an RCT of this nature in general practice; and causality could still not be conclusively demonstrated with a cohort study.

9.4.2.2 Existing literature

The findings of this study support the model that seeing the same doctor builds a depth of relationship (3.2.2). As far as the author is aware, no study has been published that examines the link between number of consultations and patient-doctor depth of relationship, but as discussed earlier (3.2.2) related research in the field has previously associated longitudinal care with patient-doctor knowledge[167;196;197] and trust.[63;197;212]

9.4.3 Generalisability of findings

The study was conducted in practices in one region of the UK (Bristol, North Somerset and South Gloucestershire), with a sample of doctors and patients that have different characteristics to the national average in several respects. Consequently the generalisability of the longitudinal care-deep relationship finding may be limited.

9.4.3.1 Study GPs

GPs were recruited non-randomly from practices, the majority of which were members of a research consortium. In addition, most practices were in urban areas (80.7%) and were involved in GP registrar training (74.2%). Comparing their characteristics with available statistics in England for 2005: the majority of GPs (61.3%) were between 46-55 years of age, where nationally 65% were aged between 40 and 59 years;[389] but the average practice list size of 9663 was higher than the national average of 6250,[390] and there were more male (64.5%) than female GPs, whereas nationally women represent around 40% of the workforce.[389] The mean GPAQ communication skills score for the GPs in this study was 87.7% (range of means 77.1% to 97.7%), above the national benchmark figure of 83% for 2005-2006.[375]

9.4.3.2 Patients

How some of the characteristics of Bristol residents compare with the national picture has been previously considered (5.4).

The characteristics of patient participants and their consultations are similar to previous studies in respect of number of problems and consultation length. Definitions of what constitutes a problem vary and the data on the number of problems in this study (49.6% said they had one problem to discuss and 47.6% said they had two or three problems) may not be directly comparable with previously reported figures. Nonetheless in studies of primary care in the UK[391] and USA[392;393] patients have been observed to present an average of between 1.7 and 3.0 problems per encounter. The overall median consultation length during the study surgeries was 12 minutes (range 3 to 30) and the mean was 12.4 minutes (SD 5.0). The mean consultation length by GP varied from 9.6 to 15.8 minutes. These figures are similar to the UK average estimates of between 11.7 and 13.3 minutes.[394-396]

The extent to which participants experienced longitudinal care may differ from that described in previous research. During the 12 months before the index consultation, participants had on average more encounters with their general practice than the national average, and there was greater variation in the study sample: study median of 8 (IQR 4 to 14) doctor or nurse appointments; national median of 5.3 per person-year (IQR 4.6 to 6.0) according to QResearch.[397] The median number of doctor consultations for each patient during this period was also higher and more variable than is perhaps typical: study median 5 (IQR 2 to 9) compared with national median of 3.3 (IQR 2.9 to 3.8) consultations per person-year.[397] This may partly reflect that 31.4% of participants were 66 years or older, compared with an average of 16.1% for England and Wales in 2007.[398] That is, consultation rates were observed to increase with age both in the study sample and on national data.[397] In addition, one would expect a cross-sectional of GP attendees to have higher consultation rates than the general population.

In terms of who patients consulted with during the continuity defining period, the nurse/doctor share of 34.7%/65.3% is similar to what one might expect (QResearch figures 34% nurse, 62% doctor), as was the type of encounters (study sample/QResearch figures: surgery 89.4%/83%, telephone 8.6%/11% and home visits 1%/4%).[397] UPC rates in UK primary care populations have been previously reported as varying between 0.42 and 0.87,[42;59;196;212] with higher figures observed for patients attending personal list practices.[42;59;196] The mean UPC for participants in this study was 0.58 and was not found to vary according to different lists systems, although the average varied widely by GP (0.39 to 0.86).

GPs said they knew 214 (44.2%) patients "well" or "very well". Because of the variation in the scales used in previous studies, it is difficult to compare GPs' knowledge of patients in this study with published figures. However, Hjortdahl[344] reported that knowledge was "good" or "excellent" in 39% of consultations, Gulbrandsen *et al*[345] found that personal knowledge was "good" or "very good" in 66% of cases, and GPs in Drivsholm *et al*'s study[346] said they knew 48% patients "very well".

9.5 Patient-doctor continuity and GP detection of patient psychological distress

No association between patient-doctor continuity (either depth of relationship or longitudinal care) and GP detection of patient psychological distress was found in the primary analysis. First, possible reasons for this are explored. Second, the implications of the study design and how the findings fit-in with the existing literature are discussed. Third, the generalisability of the findings are considered.

9.5.1 Possible explanations for findings

As previously (9.4.1), possible explanations for findings are considered under the headings of chance, confounding and bias.

9.5.1.1 Chance

The size of the sample could be a significant reason why an association may have been present but was not observed in the primary analysis. This is reflected in the width of 95% confidence interval limits of the adjusted odds ratio of GP detection of psychologically distressed patients by *deep/shallow* patient-doctor relationship (8.4.2.1): although the true odds ratio could be a low as 0.4, it could also be as high as 3.0, which would be clinically important.

The size of the patient sample recruited would have been larger had the author realised that the target sample of 300 patients attending 30 GPs (a minimum of 10 per GP) was the number of psychologically distressed patients, i.e. GHQ cases, needed for analysis, rather than just the total number of participants. In the study, 541 patients who consulted with 31 GPs returned a questionnaire, of which 490 (between 10 and 26 per doctor) gave consent to access their medical records. Of those participants, 463 patients completed the GHQ and 218 (47.1%) were GHQ cases. The mean proportion of participants that were GHQ cases by GP was 47.6% (range 24.0% to 87.5%), with between 3 and 14 cases per GP. Only five GPs had 10 or more cases (see Figure 8-2). Therefore insufficient numbers of patients (i.e. 218 against a target of 300) were recruited to the study. This error was only realised at the analysis stage of the project.

The small sample size is further aggravated by the problem of missing data in the logistic regression models so that where data on one or more covariates were missing, that patient was dropped from the analysis. This is illustrated in the number of subjects included in the crude estimation of the odds ratio of detection for increasing depth of relationship (n=210), compared with the fully adjusted odds ratio (n=189, Table 8-15). It is noteworthy however that despite these limitations, some (patient symptom attribution and GHQ score) but not all (number of patient-study GP consultations per year, patient-doctor communication, and consultation length) previously reported associations with GP detection of psychologically distressed patients (3.3.2) were still observed (Table 8-19).

Conversely, the association between depth of relationship and moderate or severe GP cases and patients scoring four or more on the GHQ might have occurred by chance. This was the only positive finding in exploratory analyses for eight different combinations of patient-doctor continuity (depth of relationship and longitudinal care), GP (none/mild, mild/moderate) and GHQ (2/3, 3/4) thresholds for caseness. The issue of the threshold adopted for the primary analysis is discussed later (9.5.1.3.4) but interesting results in such analyses should be interpreted with caution.[399]

9.5.1.2 Confounding

All of the patient and consultation variables included in the patient-doctor longitudinal care-deep relationship logistic regression model were also included in the continuity-GP detection of psychological distressed patients analyses, along with additional variables that may confound an association. There was some evidence of confounding for patient health characteristics and consultation factors (Table 8-15).

It is possible that other relevant confounding factors were not measured and/or adjusted for. For example, different combinations of patient-doctor gender and/or doctor-patient attitude may be associated with both continuity and detection of psychological distress. The sex of patient and physician may matter more in long-term relationships, and same-sex physician-patient dyads may result in better rapport and symptom disclosure.[400] Meta-analyses of physician sex in communication found that female physicians engage in more psychosocial question asking and emotionally focused talk[401] and patients of female physicians discuss more psychosocial information than patients of male physicians.[402] Law and Britten[403] reported that median patient-centredness scores were highest among female-female and lowest among male-female GP-patient dyads. Lastly, Giron *et al*[292] observed an inverse relationship between negative doctor attitudes toward the patient and the identification of emotional disorders.

9.5.1.3 Bias

As previously (9.4.1.3), this section considers types of bias that may have affected the internal validity of the study. The primary association of interest was between patient-doctor depth of relationship and GP detection of psychologically distressed patients. The first question is whether any recruitment bias could have affected the findings. Patient psychological distress was assessed by asking patients to complete the 12-item version of the GHQ and asking doctors to complete a four-point distress rating scale. GP assessment of patients' psychological state was then compared with the GHQ as the "gold standard". Other points to be discussed therefore concern the appropriateness of how patient psychological distress was ascertained, GP and GHQ assessments were compared, and the choice of GP and GHQ caseness.

9.5.1.3.1 Selection bias

Although data upon which comparisons could be made were limited, participants were noted to have similar levels of psychological distress to non-participants but were better known to study GPs (8.2.1.3). Obviously no data were available on non-participant GHQ and patient-doctor depth of relationship status, but it is possible that there was also greater depth of relationship among participants compared with non-participants yet similar levels of psychological distress. If this were the case, then an association between depth of relationship and GP detection of psychologically distressed patients would have been diminished.

9.5.1.3.2 Assessment of patient psychological distress

Data on patients' psychological state were obtained using the commonly employed method of asking GPs to complete an assessment scale and getting patients to complete a validated questionnaire (the 12-item version of the GHQ). The GP assessment question and response scale used in this study was based on earlier research and designed to permit a fair comparison with the GHQ.

GPs were blind to patients' responses on the questionnaire (in particular their GHQ score) and patients were not aware of the study hypothesis. However, the doctors in this study were aware that the investigator was interested in continuity in relation to physicians' identification of psychological distress in their patients, and clearly taking part in this study may have altered how the patient or doctor behaved during their encounter. A study by McCusker *et al*[404] found that asking physicians specifically about a possible diagnosis of depression as opposed to relying on medical note review tended to increase sensitivity but decrease specificity. However, there was no reason to suppose that any "Hawthorn effect" might operate differentially between high and low continuity patients.

It is worth remembering that assessment of patient psychological distress was not necessarily the focus of each patient-study GP consultation. This reflected in the figures on patients' problem attribution and the proportion of visits spent discussing emotional issues (Table 8-6). In consultations that were not explicitly psychological in nature it might therefore seem unfair to compare GPs' "incidental" assessments with a specific measure of psychological distress. However, it could be argued that doctors should be always aware of the patient's general psychological state because it may still usefully influence how they manage the presenting complaint(s). Indeed, the basis of the second study hypothesis (4.4.2) is that the doctor who has an on-going relationship with the patient has an advantage over a colleague who does not.

9.5.1.3.3 Comparison of GP assessment with the GHQ as "gold standard"

Just as how the data on patient psychological state were collected is an accepted approach, so too is the principle of assessing GPs' performance by directly comparing it with the GHQ. That is not to say that this is an uncontentious issue, but given its importance it has been the subject of relatively little debate in the literature.[405] Tyrer[406] recently listed the following explanation for why GPs may disagree with psychiatric instruments: the doctor is incompetent; they are competent but they have a different diagnostic threshold; or they are competent yet judgements disagree because their assessment is superior to the "gold standard" assessment.
Therefore the key issue is whether one believes that the GHQ provides a more accurate assessment of the patient's psychological state than the GP's.

The GHQ is established as a practical and reliable way of detecting psychological disturbance, but it been criticised for representing a "specialist point of view".[343] Alternative measures of psychological well-being have been developed[407;408] yet they themselves do not necessarily agree.[409;410] Comparing GP opinion with more than one type of assessment may have lowered the amount of disagreement but including another such scale in the patient questionnaire would have increased the respondent burden. The GHQ is not a diagnostic instrument – a score above a given threshold does not necessarily identify a mental disorder in that patient, only that the probability that they have a disorder is increased. In addition it may be subject to ascertainment bias. Bell *et al*[411] have reported that the GHQ may lead to a higher estimate of prevalence in subjects who are better off financially and who have better social support (false positives). Thus, GPs who excluded emotional distress in GHQ positive patients may have been "correct" and the measure "wrong".

On the counter-side, some patients may be distressed but not cross the GHQ threshold for psychological disorder. Patients with psychosocial issues may still benefit from identification and discussion of their problems,[312] and recognition of sub-threshold psychiatric cases may significantly influence patient expectations and GPs decisions on how to manage the presenting symptoms.[412] GPs who identify these sorts of problem will again be unfairly criticised for failing to agree with the GHQ. The problem of GHQ false negatives may be a particular problem among chronically distressed patients. The GHQ "focuses on breaks in normal functioning and is concerned with a person's … experience of new phenomena of a distressing nature"[413] where an "as usual" response indicates normality.[356] Respondents with a long-standing disorder may therefore reply "Same as usual" to all the items and thus not be identified as a potential case. Whilst it is true that chronically distressed patients may normally feel this way, the response does not indicate normality in the psychiatric sense. In the last edition of the GHQ manual,[356] it was argued that less cases are lost this way than expected "since many patients cling to a concept of their 'usual self' as being without symptoms."

One approach that has been suggested for researchers to avoid missing cases is to use the C-GHQ scoring system.[413] Instead of coding negative items on the GHQ as 0-0-1-1, Goodchild and Duncan-Jones[414] proposed using 0-1-1-1, which has the effect of giving greater weight to chronicity. However, performing relative operating characteristic analysis, Surtees[415] reported there was no difference in the conventional and revised scoring systems' abilities to discriminate affective conditions. Although these investigations were done on the 30-item version of the GHQ, subsequent work on the 12-item version has similarly reached mixed conclusions.[364;416;417]

The sensitivity and specificity of the GHQ for a given threshold in relation to a diagnostic instrument is known to vary between populations[356;364] and altering the cut-off is one way of trying to balance the number of false positives and negatives. For example, the number of false positives can be minimised by raising the GHQ threshold. This has the effect of increasing the positive predictive value of GP assessment and producing a sample whose average degree of disturbance is greater and less likely to remit spontaneously, but also causes some of the true positives to be lost. The implications of the specific thresholds for both GHQ and GP caseness on the research findings are discussed in more detail below (9.5.1.3.4).

Lastly, it could be argued that an alternative way of looking at the data would have been to compare GP discussion of emotional or psychological problems (none/any) with GHQ caseness. That is, even if GPs disagreed with the GHQ on the severity of distress, there may have been greater agreement with simple presence/absence of an emotional issue.

9.5.1.3.4 Threshold for caseness

GP detection of psychologically distressed patients was examined by dichotomising GP assessments and GHQ scores into cases and non-cases, and by analysing data restricted to GHQ cases only. Clearly the GP (none/mild) and GHQ (2/3) thresholds for caseness adopted for the primary analysis decisions had an important bearing on the study's findings, because whilst in the primary analysis no association between either depth of relationship or longitudinal care and GP detection was found using these thresholds, depth of relationship was linked to GP detection with the combination of higher cut-offs (GP: mild/moderate; GHQ: 3/4) in the exploratory analyses. For the primary analysis, the GP threshold was chosen in order to maximise GP sensitivity, while the GHQ threshold was adopted because it has been used in comparable studies[268;418-420] and was the cut-off recommended in a validation study in UK general practice.[362] In retrospect however, it may have been more appropriate to have chosen higher GP and GHQ cut-offs for the following reasons. First, using the GP case threshold of none/mild, GP sensitivity was already high (Table 8-14: between 72.0% and 76.2%, depending on GHQ threshold) so an effect of patient-doctor continuity, specifically depth of relationship, on GP detection of psychologically distressed patients was less likely to be seen. Second, in the absence of a validation study, Goldberg and colleagues[363] state the the best GHQ threshold depends on the sample mean GHQ score. In this study where the mean GHQ score was 3.6 (8.2.3.4.2), they recommend a GHQ threshold of 3/4.

However, as acknowledged earlier (9.5.1.1), because multiple statistical tests increase the risk of a chance finding, the findings of secondary or exploratory analysis must be treated with caution. The possible association between depth of relationship and GP detection of psychologically distressed patients should be confirmed in another study where the thresholds for GP caseness of mild/moderate and GHQ caseness of 3/4 are pre-determined as the cut-off points for the primary analysis. The results of the exploratory analyses do not change the findings for GP accuracy of course: both depth of relationship and longitudinal care appear to be associated with GPs over-reporting patient psychological distress. Comparison of *deep* and *shallow* relationship (Table 8-20) or *known* and *unknown* patients (Table 8-24) using GP case threshold of none/mild suggests differences in: GP sensitivity to patient psychological distress; and the proportion of GP cases among GHQ non-cases (Table 8-21 and Table 8-25). Such differences were not apparent when *deep* and *shallow* relationship patients were compared with a GP case threshold of mild/moderate (Table 8-22 and Table 8-23). Yet, when this phenomenon is explored across the range of depth of relationship scores, GPs are found to be more likely to report the patient as being psychologically distressed independent of their GHQ score and GP case threshold.

9.5.2 Interpretation of findings

9.5.2.1 Study design

As discussed earlier (9.4.2.1), although there are advantages to cross-sectional studies when conducting exploratory research of this nature, it is important not to assume causation from the association. In the case of patient-doctor continuity and GP detection of patient psychological distress of course, this is not an issue because no association was demonstrated. However, the cross-sectional nature of the data still limits other inferences that can be made about the findings.

We do not have any information about patients' psychological state at previous consultations with the study GP, which may have influenced doctors' assessment at the index consultation. Patients with recent onset of symptoms or who are recovering may not meet criteria for disorder on GHQ, yet their physician may identify them as relapsing or recovering from an episode. Only a longitudinal study with serial GHQ assessments would be able to address this issue.

9.5.2.2 Existing literature

Obviously one of the justifications for undertaking this investigation was the limited amount of published research on patient-doctor continuity and GP detection of psychological distress (3.3.2.4). The only comparable study that the author is aware of, conducted in primary care and investigating familiarity from the patient perspective, has been published by Robinson and Roter.[295] Although they linked patient-physician familiarity with psychosocial problem disclosure, it differed from the present study in several respects: it was conducted in Baltimore, USA; the sample was restricted to patients scoring five or more on the GHQ-28; patient-physician familiarity was assessed using a single question item with four response categories (not at all, slight, moderate or high); and primary care physician assessments were compared with variables derived from audiorecordings of their consultations. These factors, in addition to the foregoing discussion of the findings of this investigation, may explain why the results are different.

In respect of GP accuracy, Haller *et al*[311] also found that continuity appeared to favour over-identification of emotional distress. It should be noted that their study was conducted in Australia, was restricted to young people (16-24), used Kessler's scale of emotional distress (K10) rather then the GHQ, and operationalised continuity in terms of "seeing my usual doctor" rather than in terms of quality of patient-doctor relationship. Nonetheless, this and the present study's findings do fit in with a broader literature that has linked doctor knowledge of patient with over-detection.[253;312]

9.5.3 Generalisability of findings

Some of the characteristics of the study sample that may also limit the generalisability of the continuity-detection findings have already been discussed

(9.4.3). This section considers the factors specific to patient psychological distress. Comparing the present study's findings with that of earlier studies is difficult because apparent differences may actually be related to where the research was conducted and how GP detection was judged. Even if one only considers investigations conducted in UK general practice that have adopted the GHQ as "gold standard", investigators have still used alternative GP assessment scales and thresholds for GP/GHQ thresholds for caseness, and have presented their results using different statistics.

The overall prevalence of psychological distress according to GP and GHQ were similar (51.0% and 47.1% respectively). These levels of GP and GHQ caseness are generally higher than those reported in previous studies carried out in UK primary care. Regarding GP cases, Boardman[230] and Marks *et al*[237] (at threshold 2/3 on six point GP assessment scale of "none" to "severe emotional disturbance") reported overall levels of 19.3% and 31.1% respectively. Regarding GHQ cases, studies by Howe,[366] Stirling *et al*,[287] May[418] and Kessler *et al*[268] have reported overall levels of 39.6% and 40.2%, 44.7%, 50%, and 52% respectively. In the present study, both GP and GHQ levels of psychological distress varied considerably by GP (GP range 18.1% to 100%, GHQ range 24.0% to 87.5%). Boardman,[230] Marks *et al*[237] and Stirling *et al*[287] have reported GP ranges by GP of 0.0% to 36.6%, 3.0% to 77.0% and 12% to 64% respectively. Stirling *et al*[287] reported GHQ ranges by GP of 34% to 79.6%. There therefore appears to be a greater psychological burden in this study sample, compared with previous research.

Restricting further comparisons regarding GP detection to the studies by Howe[366] and Kessler[350] (both conducted in the UK, and compared GPs' performance with the GHQ-12) it would appear that in general the GPs in this study were more sensitive but less specific. Overall, GPs sensitivity was 72.0% (95% CI 65.4% to 77.9%), which is higher than reported by Howe (reported sensitivities in two studies of 44% and 52%) and Kessler (57%). The overall GP specificity of 67.1 % was lower (Kessler 80%). Some of these differences may have occurred because of methodological differences. So, Howe used a five-point GP assessment scale (cut-off for GP case was subclinical/mild) and a higher GHQ-12 threshold (3/4); Kessler's study had the same 2/3 cut-off for caseness on the GHQ-12, but the difference may be explained by his choice of a GP assessment scale (presence of depression or anxiety, yes/no) that probably required a higher threshold for GP caseness. Lastly, the sensitivities and specificities reported are more similar to that seen in this study sample with the GP threshold for caseness of mild/moderate rather than the none/mild (Table 8-14).

9.6 Summary

9.6.1 Does seeing the same doctor lead to patient-doctor depth of relationship?

Using a scale specifically developed to assess patient-doctor depth of relationship, an association between patient-doctor longitudinal care and deep relationships has been found. It is concluded that this is a true finding, not explained by chance, confounding or bias. The study was based on a model that assumes that patient-doctor depth of relationship is established over a series of satisfactory encounters, incrementally increasing from one visit to the next. Although these findings support this model, the cross-sectional nature of the study means that neither a causal relationship nor an incremental effect has been established. In fact, the association between number of consultations and deep patient-doctor relationships appeared to be curvilinear. That is, after a certain number of consultations there was no further increase in the probability of having a deep relationship.

9.6.2 Does patient-doctor continuity lead to better GP detection of patient psychological distress?

There was little evidence to support an association between either patient-doctor depth of relationship or longitudinal care and GP detection of psychologically distressed patients. This cannot be taken as the definitive answer because of a number of methodological issues, the most important of which are the sample size and choice of GP and GHQ threshold for caseness. It may be that if this study were repeated with a larger number of participants and a higher cut-off for GP and GHQ caseness, an association between patient-doctor depth of relationship and GP detection would be seen.

However, patients with "high" patient-doctor continuity do appear to be more likely to be misclassified. An association for both patient-doctor depth of relationship and longitudinal care with GP over-reporting of patient psychological distress was observed, regardless of the GP and GHQ thresholds for caseness used.

10. Conclusions

This study applied a model of continuity that distinguishes between patient-doctor longitudinal care, consultations and depth of relationship study to test the hypothesis that seeing the same doctor builds a depth of relationship. It also examined the value that patient-doctor continuity has to one aspect of clinical practice, specifically testing the hypothesis that patient-doctor depth of relationship is associated with better identification of psychological distress in patients by their GPs. Having found evidence to support the first hypothesis but not the second, this thesis concludes by considering what implications the findings have for clinical practice and future research.

10.1 Implications for clinical practice

The finding that patient-doctor longitudinal care is associated with deep relationships will probably confirm what many practising GPs already thought. One interpretation could be that patient-doctor continuity should be promoted, especially for the types of patients and problems described by earlier research (chapter 2) when it might be most beneficial. However, this study does not of course provide direct evidence that continuity of doctor leads to improved care processes and outcomes in these different situations. Indeed, the second part of this study did not find any benefit from patient-doctor continuity for the identification of patient psychological distress (see below). Even if the evidence base for patient-continuity is strengthened by future research in this or situations, GPs who want to promote patient-doctor longitudinal care, and hence depth of relationship, in their practices still have to address the competing issues of access and choice. As previous investigators have shown (2.2.3), getting to see the same doctor is the product of a complex interplay of factors, including availability of doctor, and the urgency and type of problem. These matters were not directly addressed in this study and in a resource-limited healthcare system a compromise will always have to be struck between how much continuity is provided at the level of the doctor and how much at the level of the practice. What the ideal balance is, and how interchangeable the concepts of patient-doctor and patient-practice/team continuity are, remain unanswered questions.

Patient-doctor continuity, in depth of relationship or longitudinal terms, was not associated with GP detection of psychologically distressed patients, and if anything it appeared that it may be associated with GPs over-identifying emotional disturbance. Therefore although previous research has suggested a possible link between continuity and GP recognition of patient psychosocial and mental health problems, doctors should be alert to the potential of mislabelling patients with whom they have developed a relationship. The sceptical GP could argue that in the absence of evidence to show recognition of psychological problems leads to better outcomes, no further time or effort should be spent trying to improve doctors' detection rates. Indeed, researchers have been criticised for "medicalising misery".[405] However, this stance denies the importance of patients' emotional state in every encounter. After all, "all consultations have a psychological component but not always a problem."[235] The message from the existing body of literature on the importance of the quality of the interaction between patient and doctor and the duration of encounter for recognition of psychological or emotional distress stands. Both of these factors are amenable to improvement and lengthening respectively, and research has linked them with other benefits to patient care. Previous research also suggests that seeing the same doctor helps in the on-going management of patients with recognised mental health problems. Regarding the initial identification of psychological and psychiatric disturbances, which doctor the patient sees appears to be a less important issue.

10.2 Implications for future research

Future research can be proposed around the three major themes of this thesis: further developing the patient-doctor depth of relationship questionnaire; broadening our understanding of the association between longitudinal care and depth of relationship, especially with regard to the type and quality of individual consultations; and investigating the value of depth of relationship to

GP detection of patient psychological distress and patient care processes and outcomes more generally.

10.2.1 Patient-doctor depth of relationship questionnaire

Further research is required to assess how the patient-doctor depth of relationship questionnaire performs in patient populations that are different to the one in which it was developed and employed in this study. Whilst considerable effort was made to evaluate its psychometric properties, Fayers and Machin[329] remind us that:

> *"Confirming validity is never proof that the instrument, or the scales that it contains, are really tapping into the intended constructs. Poor validity or reliability can suffice to indicate that an instrument is NOT performing as intended. Demonstration of good validity, on the other hand, is a never-ending process of collecting more and more information showing that there are no grounds to believe the instrument inadequate."*

In particular, the stability (test-retest reliability) and "divergent" validity (how distinct it is from other measures of patient-doctor relationships, such as the CARE[367] instrument) of the scale have yet to be determined. Further modification of the questionnaire may be appropriate: it may be that the number of items could be further reduced without sacrificing fidelity; and the questions or response scales changed to obtain a more normal distribution of scores.

10.2.2 Patient-doctor longitudinal care and depth of relationship

Further research into the association between patient-doctor longitudinal care and depth of relationship demands a larger and more complex study that addresses the limitations of this investigation. Key to this is the need for a longitudinal design, a "much needed and vastly underutilized" [129] means of answering some of the most important questions in continuity research.

The ideal study would recruit a cohort a patients newly registering with a general practices and prospectively collect longitudinal, consultation and depth of relationship data at every visit. This would enable three central issues to be explored. First, the causal relationship between patient-doctor longitudinal care and depth of relationship. Second, how depth of relationship changes over time with different numbers, types and characteristics of encounter. This would help resolve long-standing methodological issues about whether the type of consultation (face-to-face, telephone, etc.) and/or the interval between them are significant. Third, if data were collected on visits to all doctors in each practice, it would be possible to explore how patient-doctor relationships develop in parallel and whether seeing two or more doctors affects the development of these relationships.

All of the aforementioned aspects could also be evaluated from the perspective of the doctor. Continuity of patient and doctor may effect patient healthcare in ways that are only apparent when the viewpoint of the GP is considered: is longitudinal care associated with doctor-patient depth of relationship, and hence superior patient care?

10.2.3 The value of patient-doctor depth of relationship to patient care

With a longitudinal study of type described above, out-standing questions about the value of patient-doctor depth of relationship to the recognition of psychological problems and other patient care processes and outcomes could be assessed.

If the study were of sufficient size and data were collected on patients' psychological state, the central unresolved question of whether patient-doctor continuity is associated with better GP detection of patient psychological distress could be answered. Two other issues that could be explored include: the possible influence of previous consultations (duration, level of patient psychological distress, etc.) on subsequent detection; and the relative contribution of longitudinal care, depth of relationship and perhaps the discussion of psychological issues to GP recognition of patient distress. In addition, there would be opportunity to look beyond detection and examine outcomes: is there evidence of a therapeutic effect of depth of relationship on patients' psychological outcome?

Of course, during the course of such a study data could also be collected on other conditions and groups of patient, such as those with chronic disease or multiple medical and social problems. Example research questions might include is depth of relationship associated with: earlier detection of serious illnesses, more appropriate use of tests or prescribing of medicines, and/or the better care and outcome of long-term conditions?

10.3 Concluding remarks

There seems little doubt that continuity will continue to be an important topic to patients and doctors.[14] It seems a cause worthy of further research because of uncertainty about its benefits and its implications for how healthcare is organised and delivered, in the UK and internationally. Evidence of its contemporary relevance comes with the recent proposal by the American College of Physicians of an advanced medical home model,[421] in which "continuous healing relationships" are promoted and a personal physician has responsibility for providing coherent and effective care.

The challenge to clinicians and researchers is to finally agree on what the different types of continuity are and to definitively evaluate their respective importance for patient care. Continuity has traditionally been a core value of primary care, but its worth will only be settled in the context of other defining characteristics. In his recent McMenzie lecture for example, Marshall[422] lists three core values to being a GP: excellent medical generalism, whole person care, and advocacy. He argues although relational continuity is important for some people at some times of their lives, it is a "non-essential" element of general practice; continuity should be seen as a tactic that helps deliver the three core values, rather than as core value in itself. This viewpoint acknowledges the importance of thinking about continuity in terms of its utility rather than as a means by which to define a profession (1.1.1).

11. Appendix

11.1 Data collection and processing

Table 11-1 Characteristics of participating practices

Practice/GP identifier	Practice characteristics					Questionnaire development			Main study
	Category	**List size**	**Training?**	**No**	**WTE †**	**I**	**R1**	**R2**	
01	Urban	9264	Yes	10	5.625				●
02	Urban	10421	No	10	6.875				●
03	Urban	13897	Yes	12	8				●
04	Urban	7636	Yes	6	4.5				●
05	Inner city	10621	Yes	8	6				●
06	Urban	11245	Yes	8	6.125				●
07	Urban	16204	Yes	10	9.125	●	●		●
08	Inner city	8710	Yes	8	6.875	●	●		●
09	Urban	11500	Yes	11	7.75				●
10	Urban	9600	No	6	4.75			●	●
11	Rural	4500	No	3	2		●		●
12	Urban	9700	Yes	8	6.125				●
13	Urban	7628	Yes	7	4.375				●
14	Urban	8407	Yes	9	6.125	●	●		●
15	Urban	7635	Yes	7	4.625				●
16	Urban	14300	Yes	13	9.5				●
17	Urban	13588	Yes	7	5.25	●			●
18	Urban	6674	No	7	4.375			●	●
19	Inner city	16300	Yes	10	7.875				●
20	Urban	10680	No	8	6.25				●
21	Urban	9010	Yes	9	6				●
22	Urban	9300	No	8	5.375				●
23	Urban	12300	No	10	8.125				●
24	Urban	11600	Yes	10	7.375				●
25	Urban	7668	Yes	9	5				●
26	Urban	7250	Yes	7	4.625				●
27	Urban	5079	Yes	4	2.5		●		●
28	Rural	8447	Yes	5	4.125				●
29	Urban	6280	Yes	6	4.25				●
30	Inner city	7100	No	6	3.625				●
31	Urban	7000	Yes	6	3				●

Key:
I – interviews, R1 – Round 1, R2 – Round 2.
† WTE: Whole Time Equivalent (to the nearest 0.25)

Table 11-2 Summary of recoding and categorisation of original GP data

Variable		Format	
Name	**Type**	**Original** (categories/range)	**Revised categorical**
GP age	Continuous	30-60	26-35, 36-45, 46-55, 56-65
GP psychological orientation	Continuous	1-6	Low
		6-12	High
GP estimation of proportion of consultation spent discussing patient emotional/psychological problems	Categorical	None	None
		Some, about, half, most, all	Some
GP assessment of patient psychological distress	Categorical	None	Non-case
		Mild, moderate, severe	Case

Table 11-3 Summary of recoding and categorisation of original patient and consultation data

Variable		Format	
Name	**Type**	**Original** (categories/range)	**Revised categorical**
Patient age	Continuous	16-93	16-25, 26-35, 36-45, 46-55, 56-65, 66-75, 76+
Patient ethnicity	Categorical	White	White
		Mixed	Non-white
		Black or Black British,	
		Chinese	
		Asian or Asian British	
		Other	
Patient marital status	Categorical	Single	Single
		Living with partner	Married/living with partner
		Married/civil partnership	
		Divorced,	Divorced/separated
		Separated	
		Widowed	Widowed
Patient employment status	Categorical	Employed (full or part-time including self-employed);;	Employed
		Unemployed and looking for work	Unemployed
		Retired from paid work	Retired
		Looking after the home or family	Other
		At school or in full-time education	
		Long term carer	
		Unable to work due to long term sickness	
		Other	
Patient educational status	Categorical	No formal qualifications	None
		NVQ levels 1-3/GNVQ, ,	Basic
		CSEs/O levels/GCSEs or equivalent	
		Other qualifications (e.g. City and Guilds, RSA/OCR, BTEC/Edexcel)	
		NVQ levels 4-5, HNC or HND	Advanced
		AS levels/A levels or equivalent	
		Degree or higher degree	Higher

Table 11-3 (continued)

Variable		Format	
Name	**Type**	**Original** (categories/range)	**Revised categorical**
Patient self-rated health	Categorical	Poor	Poor
		Fair	Fair
		Good	Good
		Very good	Great
		Excellent	
Number of patient problems	Categorical	1	Single
		2	Multiple
		3	
		4	
		5 or more	
Patient problem attribution	Categorical	Physical	None
		Mixture of physical and emotional	Some
		Emotional	
		Other	-
Patient psychological distress (GHQ-12)	Continuous	0-2	Non-case
		3-12	Case
Patient-doctor communication (GPAQ communication scale)	Continuous	37.5-100	Quintiles
Patient-doctor depth of relationship	Continuous	0-31	Shallow
		32	Deep
Consultation length	Continuous	3-4.99	Very short
		5-9.99	Short
		10-14.99	Medium
		15-29	Long

11.2 Patient-doctor depth of relationship questionnaire

Table 11-4 Pilot round one: 32-item draft version of patient-doctor depth of relationship questionnaire
Performance of question items: distribution of responses, missing responses, item means and standard deviations.

No	Item	Response categories					Missing	Mean	SD
		Not at all	Poorly	Well	Very well	Extremely well			
1	I know this doctor	83	30	118	81	34	29	2.86	1.29
2	This doctor knows my background	66	39	109	82	49	30	3.03	1.3
3	This doctor knows my home life	129	40	91	48	30	37	2.44	1.35
4	I get on with this doctor	10	6	126	116	79	38	3.74	0.94
5	This doctor knows me as a person	113	38	88	57	41	38	2.63	1.41
6	This doctor knows what works for me	72	26	125	79	35	38	2.94	1.26
7	This doctor knows how I feel about things	68	30	122	79	38	38	2.97	1.26
8	I know what to expect with this doctor	69	16	95	100	63	32	3.21	1.36
9	This doctor supports me	23	11	120	98	87	36	3.63	1.10
10	This doctor understands how my problem(s) affect me	37	19	106	91	87	35	3.51	1.24

Table 11-4 (continued)

No	Item	Response categories: Disagree	Neither agree nor disagree	Slightly agree	Mostly agree	Totally agree	Missing	Mean	SD
11	This doctor really cares for me	8	60	43	116	115	33	3.79	1.15
12	There is a strong bond between me and this doctor	43	96	59	74	63	40	3.05	1.33
13	I can totally depend on this doctor	21	68	34	88	128	36	3.69	1.32
14	This doctor feels completely relaxed with me	4	60	43	106	126	36	3.86	1.14
15	This doctor takes me seriously	1	30	32	124	152	36	4.17	0.95
16	I can be myself with this doctor	6	27	31	111	166	34	4.18	1.01
17	This doctor tries hard to work with me	2	33	45	114	144	37	4.08	1.00
18	This doctor knows exactly what to expect with me	22	74	42	103	92	42	3.51	1.28
19	I have complete confidence in this doctor	5	28	25	113	168	36	4.21	1.00
20	This doctor accepts me the way I am	3	49	23	111	151	38	4.06	1.09
21	This doctor knows me inside-out	86	68	53	78	51	39	2.82	1.43
22	I feel totally relaxed with this doctor	7	28	45	102	158	35	4.11	1.05

Table 11-4 (continued)

No	Item	Response categories					Missing	Mean	SD
		Poor	Fair	Good	Very good	Excellent			
23	My rapport with this doctor is	7	42	117	90	82	37	3.59	1.05
24	This doctor's dedication to my care is	2	34	104	99	99	37	3.77	1.00
25	My trust in this doctor is	5	29	89	84	133	35	3.91	1.06
26	This doctor's respect for me is	3	32	102	97	103	38	3.79	1.01
27	My relationship with this doctor is	9	40	103	103	82	38	3.62	1.06
28	This doctor's trust in me is	3	42	106	108	68	48	3.60	0.99
29	My respect for this doctor is	3	29	79	81	146	37	4.00	1.04
		Definitely not	**Probably not**	**Possibly**	**Probably**	**Definitely**			
30	If I need to see a doctor, I try to see this one	5	20	73	71	169	37	4.12	1.04
31	I would forgive this doctor if he/she made a genuine mistake	11	18	84	116	107	39	3.86	1.03
32	I would be very concerned if this doctor left	13	50	57	59	160	36	3.89	1.25

Table 11-5 Pilot round two: revised version of patient-doctor depth of relationship questionnaire
Performance of question items: distribution of responses, missing responses, item means and standard deviations.

No	Item	Response categories					Missing	Mean	SD
		Disagree	Neither agree nor disagree	Slightly agree	Mostly agree	Totally agree			
1	I know this doctor very well	34	13	18	37	32	20	3.15	1.53
2	This doctor knows me as a person	35	16	20	30	33	20	3.07	1.54
3	This doctor really knows how I feel about things	21	27	20	35	33	18	3.24	1.42
4	I know what to expect with this doctor	21	22	17	34	40	20	3.37	1.45
5	This doctor really cares for me	7	24	20	33	49	21	3.7	1.28
6	This doctor takes me seriously	3	14	15	41	63	18	4.08	1.09
7	This doctor accepts me the way I am	4	18	12	43	58	19	3.99	1.15
8	I feel totally relaxed with this doctor	3	11	15	36	70	19	4.18	1.06
9	I would forgive this doctor if he/she made a genuine mistake	14	19	14	45	44	18	3.63	1.34
10	I would be very sorry if this doctor left	4	25	7	32	67	19	3.99	1.25
11	Overall, my relationship with this doctor is excellent	6	25	12	29	62	20	3.87	1.30

Table 11-6 Main study: one factor solution using principal factors of depth of relationship items (n=509)

Item	Factor	Uniqueness
I know this doctor very well	0.82	0.33
This doctor knows me as a person	0.84	0.29
This doctor really knows how I feel about things	0.86	0.26
I know what to expect with this doctor	0.85	0.28
This doctor really cares for me	0.85	0.27
This doctor takes me seriously	0.78	0.39
This doctor accepts me the way I am	0.79	0.37
I feel totally relaxed with this doctor	0.71	0.50

Table 11-7 Main study: varimax rotated two factor solution using principal factors of depth of relationship and GPAQ communication items

Item	Factor 1	Factor 2	Uniqueness
I know this doctor very well	**0.8431**	0.1210	0.2746
This doctor knows me as a person	**0.8652**	0.1334	0.2336
This doctor really knows how I feel about things	**0.8395**	0.2174	0.2480
I know what to expect with this doctor	**0.8374**	0.1882	0.2633
This doctor really cares for me	**0.8094**	0.2578	0.2785
This doctor takes me seriously	**0.6599**	0.3971	0.4068
This doctor accepts me the way I am	**0.7074**	0.3040	0.4071
I feel totally relaxed with this doctor	**0.5819**	0.4311	0.4755
How thoroughly the doctor asked about your symptoms and how you are feeling?	0.2451	**0.7358**	0.3985
How well the doctor listened to what you had to say?	0.2649	**0.8054**	0.2811
How well the doctor put you at ease during your physical examination?	0.1546	**0.6543**	0.5480
How much the doctor involved you in decisions about your care?	0.1253	**0.7254**	0.4582
How well the doctor explained your problems or any treatment that you need?	0.1681	**0.7239**	0.4477
The amount of time your doctor spent with you today?	0.2445	**0.6750**	0.4846
The doctor's patience with your questions or worries?	0.2235	**0.8065**	0.2996
The doctor's caring and concern for you?	0.3390	**0.7859**	0.2675

Principal factor analysis using data from the main study was repeated with the eight GPAQ communication items and the eight patient-doctor depth of relationship items. Two factors were identified which explained 95% of the variance in the data. The factor loadings after varimax rotation are shown in Table 11-7. The first factor loaded on the depth of relationship items and the second factor loaded on the communication items.

11.3 Questionnaires used in main study

11.3.1 Practice manager questionnaire

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How well does the doctor know you?
Practice Manager Questionnaire

1. **What is the name of the practice?** ____________________

2. **What is the practice's postcode** __________
(If multi-site, answer for main site)

3. **What is your practice list size?** __________

4. **How would you categorise the practice?**
(If multi-site, answer for main site)
☐0 Rural
☐$_1$ Urban
☐$_2$ Inner city

5. **Is this practice a training practice?**
☐$_1$ Yes
☐$_0$ No

6. **Does the practice receive any deprivation payments?**
☐$_1$ Yes
☐$_0$ No

7. **Do people usually see:**
☐$_0$ Any doctor
☐$_1$ Encouraged to see same doctor
☐$_2$ Always see same doctor whenever possible

8. **Do you record all consultations on the computer?**
☐$_1$ Yes
☐$_0$ No

Please turn over

9. Please tell us about all the doctors who <u>regularly</u> work in the practice:

	9.1 Name	**9.2 Sex** Male	Female	**9.3 GP type** Principal	Non-principal/ sessional	Registrar	Foundation year	**9.4 Average number of clinical (patient contact) sessions per week**	Office use only 9.5 Notes identifier
1		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
2		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
3		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
4		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
5		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
6		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
7		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
8		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
9		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
10		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
11		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		
12		☐$_0$	☐$_1$	☐$_1$	☐$_2$	☐$_3$	☐$_4$		

Please go to the last page

10. Finally, please tell us about all the nurses who regularly work in the practice:

	10.1 Name	**10.2 Sex** Male	Female	**10.3 Nurse type** Health care assistant	Practice nurse	Nurse Practitioner	Office use only 10.4 Notes identifier
1		☐0	☐1	☐5	☐6	☐7	
2		☐0	☐1	☐5	☐6	☐7	
3		☐0	☐1	☐5	☐6	☐7	
4		☐0	☐1	☐5	☐6	☐7	
5		☐0	☐1	☐5	☐6	☐7	
6		☐0	☐1	☐5	☐6	☐7	
7		☐0	☐1	☐5	☐6	☐7	
8		☐0	☐1	☐5	☐6	☐7	
9		☐0	☐1	☐5	☐6	☐7	
10		☐0	☐1	☐5	☐6	☐7	

11.3.2 GP enrolment questionnaire

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How well does the doctor know you?
GP Enrolment Questionnaire

Thank you for agreeing to take part in this study.

We would like to find out some background information about you and your work. Please take a few minutes to answer the questions over the following pages.

Your answers will only be looked at by the university research team and no-one else. No personal details will be included in any reports that result from this research.

About you

1.1	**How old are you?** Please write in whole years	___________ years	
1.2	**What year did you qualify as a doctor?**	___________	
1.3	**How long have you worked at this practice?**	___________ years ___________ months	
1.4	**How would you describe your ethnic background?** Please tick one box	White	☐ 0
		Mixed	☐ 1
		Black or Black British	☐ 2
		Chinese	☐ 3
		Asian or Asian British	☐ 4
		Other ethnic group	☐ 5
1.5	**Do you hold any of these professional qualifications?** Please tick as many as apply	DFFP	☐ 0
		DRCOG	☐ 1
		DCH	☐ 2
		MRCGP	☐ 3
		MRCP	☐ 4
		MRCS	☐ 5
		MRCPsych	☐ 6
		Other (please specify)	☐ 7

____

Please go to the next page

About you and the patients you see

Now we would like to ask you some questions about your work as a GP. Please put a mark in the box that best reflects your opinion.

		Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly agree
2.1	I believe that I should always inform patients about their prescribed treatment, making sure they understand my explanations	☐0	☐1	☐2	☐3	☐4
2.2	An important part of my role as a GP is simply to listen to patients' worries	☐0	☐1	☐2	☐3	☐4
2.3	Counselling patients with personal problems can help them to cope better in future	☐0	☐1	☐2	☐3	☐4
2.4	My medical expertise is often wasted because I see so many people who are not sick.	☐0	☐1	☐2	☐3	☐4
2.5	Often patients bring me problems which they should solve themselves or take elsewhere.	☐0	☐1	☐2	☐3	☐4
2.6	I believe that effective medical treatment depends on a partnership in which the patient plays an active part	☐0	☐1	☐2	☐3	☐4
2.7	Providing emotional support for my patients is important for my personal satisfaction.	☐0	☐1	☐2	☐3	☐4

About you and the patients you see (continued)

		Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly agree
2.8	It is important for me to be frank and open with patients	☐0	☐1	☐2	☐3	☐4
2.9	I think that it is my job to treat physical disease and to leave tasks such as counselling to other professions.	☐0	☐1	☐2	☐3	☐4
2.10	Patients are more likely to follow my advice concerning their physical complaints than advice concerning their social or emotional problems.	☐0	☐1	☐2	☐3	☐4
2.11	The majority of patients do not wish to be involved in decision making about their treatment.	☐0	☐1	☐2	☐3	☐4
2.12	The more information I give patients about their diagnosis and treatment, the more likely they are to comply with instructions.	☐0	☐1	☐2	☐3	☐4
2.13	I usually don't attempt to help patients with psychological problems because they are the result of life situations over which I have little or no control.	☐0	☐1	☐2	☐3	☐4
2.14	Most patients would prefer the doctor to take responsibility for their medical problems.	☐0	☐1	☐2	☐3	☐4

Thank you for taking the time to complete this questionnaire

11.3.3 Reception form

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How well does the doctor know you?
Reception Form

Thank you for helping with this study.

Please can you provide the below information and on the next few pages fill in the information for every patient who comes to see this GP, even if they decide not to take part in the study.

We are very grateful for your support. Please ask if you have any questions.

GP name: ____________________

Practice name: ____________________

Date: ____________________

Surgery: AM ☐ PM ☐

Instructions on how to complete

Question	Instructions
Apt no	Appointment number. This is the consultation number of the session that the patient is **booked-in** for. Even if they are seen in a different order, use the booked appointment number.
Apt time	Booked appointment time. Recording this can help you keep track of patients.
Practice Patient ID	Please write down the practice's unique identifier for that patient, which is usually the patient's **electronic patient record number**.
Patient Age	Please write down the patient's age in years on their last birthday.
Patient Sex	Please tick the correct box. M= Male F= Female
Is this patient eligible?	In order to be eligible, patients must be: 16 years or older consulting for themselves able and well enough to complete a patient questionnaire (which includes being able to read English) attending a routine or emergency GP appointment, including post-natal visits but **not** for minor surgery (including IUD/coil fits), blood tests or private medical examinations such as HGV licence. If not, please indicate why this patient/consultation wasn't eligible. If there is some reason why they are unable to take part, other than simply not wanting to, please tick the "Other" box.
Study Patient ID	Unique study identifier given to eligible patients/consultations. If given, please answer the last two questions.
Q(uestionnaire) taken?	Did this patient take a questionnaire to complete? Tick no if either they refused a questionnaire or for some reason they were not invited to take part. Take "missed" if they were not asked.
Q(uestionnaire) returned?	Did they return the questionnaire before leaving the surgery? Tick SAE if they were given a pre-paid envelope with which to post it back.

1. Apt No	2. Apt time	3. Patient Practice ID	4. Patient Age	5. Patient Sex	6. Eligible?	7. Study Patient ID (SPID)	8. Q taken ?	9. Q returned?
				M ☐0 F ☐1	Yes ☐1 No - please state why ☐2 < 16 years old ☐3 Not consulting for self ☐4 Unable to complete questionnaire ☐5 Non-qualifying consultation type ☐6 Did not attend/did not wait ☐7 Other ____________________		Yes ☐1 No ☐0 Missed ☐2	Yes ☐1 No ☐0 SAE ☐2
				M ☐0 F ☐1	Yes ☐1 No - please state why ☐2 < 16 years old ☐3 Not consulting for self ☐4 Unable to complete questionnaire ☐5 Non-qualifying consultation type ☐6 Did not attend/did not wait ☐7 Other ____________________		Yes ☐1 No ☐0 Missed ☐2	Yes ☐1 No ☐0 SAE ☐2
				M ☐0 F ☐1	Yes ☐1 No - please state why ☐2 < 16 years old ☐3 Not consulting for self ☐4 Unable to complete questionnaire ☐5 Non-qualifying consultation type ☐6 Did not attend/did not wait ☐7 Other ____________________		Yes ☐1 No ☐0 Missed ☐2	Yes ☐1 No ☐0 SAE ☐2
				M ☐0 F ☐1	Yes ☐1 No - please state why ☐2 < 16 years old ☐3 Not consulting for self ☐4 Unable to complete questionnaire ☐5 Non-qualifying consultation type ☐6 Did not attend/did not wait ☐7 Other ____________________		Yes ☐1 No ☐0 Missed ☐2	Yes ☐1 No ☐0 SAE ☐2

Summary

At the end of the study surgery, please tally-up the below figures.

1. **Number of booked consultations**

2. **Number of eligible consultations**

3. **Number of questionnaires taken**

4. **Number of questionnaires returned on the day**

   ↳ Number with signed consent

5. **Number of questionnaires to be returned by post**

11.3.4 Patient questionnaire

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How well does the doctor know you?

Patient questionnaire

Thank you for completing this questionnaire. It should only take a few minutes of your time. Your answers well help us understand whether seeing the same doctor and doctor-patient relationships matter.

When you have finished both part of the questionnaire, please return it to the researcher. Alternatively, if you prefer, post it back to us using one of our pre-paid envelopes.

More information about this study is provided on the accompanying information sheet. Please ask if you have any questions.

Instructions

We would like to ask some questions about you, your consultation today, your health and your relationship with the doctor that you are seeing.

Most of the questions offer you a choice of possible answers. For example, you may decide to answer question 6.4 like this:

		disagree	neither agree nor disagree	slightly agree	mostly agree	totally agree
6.4	I know **what to expect** with this doctor	☒	☐	☐	☐	☐

Answer as honestly as possible, and try to complete every question, even if this is the first time that you have seen this doctor. There are no wrong answers - just the option that best suits you.

There are two parts to this questionnaire. You may complete the questions on the next three pages before you see the doctor, but please complete the second section after your consultation.

Please go to the next page

About you

We would like to start by finding out more about you. This is to make sure that we include people from a range of backgrounds.

1.1 **How old are you?**
Please write in whole years

___________ years

1.2 **Are you?**
Please tick one box

- Male ☐ $_0$
- Female ☐ $_1$

1.3 **What is your current marital status?**
Please tick the most appropriate box

- Single ☐ $_0$
- Married/Civil partnership ☐ $_1$
- Living with partner ☐ $_2$
- Divorced ☐ $_3$
- Separated ☐ $_4$
- Widowed ☐ $_5$

1.4 **How would you describe your ethnic background?**
Please tick one box

- White ☐ $_0$
- Mixed ☐ $_1$
- Black or Black British ☐ $_2$
- Chinese ☐ $_3$
- Asian or Asian British ☐ $_4$
- Other ethnic group ☐ $_5$

1.5 **Is your accommodation:**
Please tick one box

- Owner-occupied/mortgaged? ☐ $_0$
- Rented or other arrangement? ☐ $_1$

1.6 **Which of the following best describes you?**
Please tick one box

- Employed (full or part-time including self-employed) ☐ $_0$
- Unemployed and looking for work ☐ $_1$
- Looking after the home or family ☐ $_2$
- At school or in full-time education ☐ $_3$
- Retired from paid work ☐ $_4$
- Long term carer ☐ $_5$
- Unable to work due to long term sickness ☐ $_6$
- Other ☐ $_7$

1.7 **What is your highest educational qualification?**
Please tick one box

- No formal qualifications ☐ $_0$
- NVQ levels 1-3/GNVQ ☐ $_1$
- NVQ levels 4-5, HNC or HND ☐ $_2$
- CSEs/O levels/GCSEs or equivalent ☐ $_3$
- AS levels/A levels or equivalent ☐ $_4$
- Degree or higher degree ☐ $_5$
- Other qualifications ☐ $_6$
  (e.g. City and Guilds, RSA/OCR, BTEC/Edexcel)

Please turn over

About your consultation

Next we would like to ask some questions about your visit to the doctor today.

2.1	**Have you seen this doctor before?** Please tick one box	No	☐ 0
		Yes	☐ 1
		Don't know	☐ 2

2.2	**How many times in the last 12 months have you seen this doctor?** Please tick one box. If you are not sure, please make your best guess.	None	☐ 0
		1-2 times	☐ 1
		3-5 times	☐ 2
		6-9 times	☐ 3
		10 times or more	☐ 4

2.3	People often see the doctor for more than one problem. **How many problems would you like to discuss with the doctor today?** By problem, we mean each thing that you would ideally like to ask the doctor about today. Please tick one box.	1	☐ 1
		2	☐ 2
		3	☐ 3
		4	☐ 4
		5 or more	☐ 5

2.4	**In your opinion, what do you think the cause of your problem is?** If you came to see the doctor about more than one problem, please answer for the <u>main</u> problem. Please tick one box.	Physical	☐ 0
		A mixture of physical and emotional	☐ 1
		Emotional	☐ 2
		Other reasons	☐ 3

About your health

Please answer these two questions about your general health.

3.1	**Do you have any long-standing illness, disability or infirmity?** (By long-standing, we mean anything that has troubled you over a period of time or that is likely to affect you over a period of time)	No	☐ 0
		Yes	☐ 1

3.2	**Over the last twelve months would you say your health has on the whole been** Please tick one box	Excellent	☐ 4
		Very good	☐ 3
		Good	☐ 2
		Fair	☐ 1
		Poor	☐ 0

Please go to the next page

About your health (continued)

These questions ask about how your health has been in general over the last few weeks. Please answer all of the questions by ticking the box next to the answer which you think most applies to you.

Have you recently …

4.1	Been able to concentrate on whatever you're doing?	Better than usual ☐ 0	Same as usual ☐ 1	Less than usual ☐ 2	Much less than usual ☐ 3
4.2	Lost much sleep because of worry?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.3	Felt that you are playing a useful part in things?	More so than usual ☐ 0	Same as usual ☐ 1	Less useful than usual ☐ 2	Much less than usual ☐ 3
4.4	Felt capable of making decisions about things?	More so than usual ☐ 0	Same as usual ☐ 1	Less so than usual ☐ 2	Much less capable ☐ 3
4.5	Felt constantly under strain?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.6	Felt you couldn't overcome your difficulties?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.7	Been able to enjoy your normal day-to-day activities?	More so than usual ☐ 0	Same as usual ☐ 1	Less so than usual ☐ 2	Much less than usual ☐ 3
4.8	Been able to face up to your problems?	More so than usual ☐ 0	Same as usual ☐ 1	Less able than usual ☐ 2	Much less than usual ☐ 3
4.9	Been feeling unhappy and depressed?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.10	Been losing confidence in yourself?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.11	Been thinking of yourself as a worthless person?	Not at all ☐ 0	No more than usual ☐ 1	Rather more than usual ☐ 2	Much more than usual ☐ 3
4.12	Been feeling reasonably happy, all things considered?	More so than usual ☐ 0	About the same as usual ☐ 1	Less so than usual ☐ 2	Much less than usual ☐ 3

Please turn over

Please complete this section AFTER you have seen the doctor

About your consultation with the doctor today

Thinking about your consultation with the doctor today, how do you rate the following:

		Very Poor	Poor	Fair	Good	Very good	Excellent	Does not apply
5.1	How **thoroughly** the doctor asked about your symptoms and how you are feeling?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.2	How well the doctor **listened** to what you had to say?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.3	How well the doctor **put you at ease** during your physical examination?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.4	How much the doctor **involved you in decisions** about your care?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.5	How well the doctor **explained** your problems or any treatment that you need?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.6	The amount of **time** your doctor spent with you today?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.7	The doctor's **patience** with your questions or worries?	☐1	☐2	☐3	☐4	☐5	☐6	☐7
5.8	The doctor's **caring and concern** for you?	☐1	☐2	☐3	☐4	☐5	☐6	☐7

Please go to the next page

About you and the doctor

Still thinking about the doctor you have just seen, please answer the following questions as honestly as possible by ticking the box that best fits with your opinion.

		disagree	neither agree nor disagree	slightly agree	mostly agree	totally agree
6.1	I **know** this doctor very well	☐0	☐1	☐2	☐3	☐4
6.2	This doctor knows me **as a person**	☐0	☐1	☐2	☐3	☐4
6.3	This doctor really knows **how I feel** about things	☐0	☐1	☐2	☐3	☐4
6.4	I know **what to expect** with this doctor	☐0	☐1	☐2	☐3	☐4
6.5	This doctor **really cares** for me	☐0	☐1	☐2	☐3	☐4
6.6	This doctor **takes me seriously**	☐0	☐1	☐2	☐3	☐4
6.7	This doctor **accepts me** the way I am	☐0	☐1	☐2	☐3	☐4
6.8	I feel **totally relaxed** with this doctor	☐0	☐1	☐2	☐3	☐4

Finally, please rate your overall relationship with this doctor.

		poor	fair	good	very good	excellent
6.9	**My relationship** with this doctor is	☐0	☐1	☐2	☐3	☐4

Please turn over

Consent

Thank you very much for answering our questions.

However, in order for us to answer our research question, we would like your specific permission to review your medical records. We need to do this to collect additional information about your visits to the doctor. Your consent to this is voluntary and you are free to withdraw it at any time.

If you agree to this, please sign and print your name and the date below.

I understand that the relevant sections of my medical records may be looked at for the purpose of retrieving information for this study, as described in the Patient Information Sheet.

________________	________________	________________
Name	Date	Signature

11.3.5 GP study surgery form

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How well does the doctor know you?
GP Study Surgery Form

Thank you for agreeing to take part in this study.

We would like you to use this form to **record every face-to-face consultation**. Please provide the information asked for as best as you can. There is some advice on answering the questions overleaf.

In order for us to be able to obtain accurate information on consultation lengths, please be sure to **log the start and finish of all your consultations** on the computer in the usual way.

We are very grateful for your support. Please ask if you have any questions.

GP name: ____________________

Practice name: ____________________

Date: ____________________

Surgery time: AM ☐ PM ☐

Guide to completing the GP Study Surgery Form

Below is some item-by-item guidance on completing the GP Study Surgery Form.

	Item	**Guidance**
1.	Appointment number	Their booked appointment number - already completed. If patients see you in a different order to which they are booked, please take care to ensure that you record your assessment against the right person.
2.	Practice patient ID	Please write down the practice's unique identifier for that patient, which is usually the **electronic patient record number**.
3.	>= 16 yrs?	We only want you to answer the rest of the questions if the patient is aged 16 years or older. Please put a ✓ or a ✗ as appropriate. If the patient is aged 16 years or older but for some reason they are not completing a patient questionnaire, please could you still answer the questions for that consultation.
4.	How much of the consultation today was spent discussing psychological or emotional issues?	Please estimate, by ticking the most appropriate option, what proportion of the consultation today was spent discussing psychological or emotional issues.
5	Do you think this patient is suffering from a psychological or emotional disturbance?	Given all that you know about the patient, make an assessment of how psychologically or emotionally distressed you think the patient is today. Here is some guidance on the options available to you: None – completely normal, patient not disturbed Mild – some symptoms but not amounting to illness Moderate or Severe – clinically significant moderate or severe psychological or emotional disturbance
6	How well do you know this patient?	Please indicate, by ticking the most appropriate option, how well you think you know the patient.

On the next page is an example of how you might fill it in.

Guide to completing the GP Study Surgery Form - Example

In the example below, the first consultation was with a mother consulting for a 5 year old with earache, so questions 4-6 were left blank. The second consultation was with a middle-aged man with hypertension, for a review of his blood pressure. In this case, the doctor knew him well, didn't spend any time discussing psychological or emotional issues but thought he was mildly distressed because he knew he had lost his job recently.

1. Appt no	**2.** Practice **Patient ID**	**3. >=16 yrs? ✓/✗**	**4. How much of the consultation today was spent discussing psychological or emotional issues?**					**5. Do you think this patient is suffering from a psychological or emotional disturbance?**				**6. How well do you know this patient?**				
			None	Some	About half	Most	All	None	Mild	Moderate	Severe	Not at all	A little	Quite Well	Well	Very well
1	1234	✗	☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
2	5678		☒0	☐1	☐2	☐3	☐4	☐0	☒1	☐2	☐3	☐0	☐1	☐2	☒3	☐4

Severity of psychological or emotional disturbance - guide:		
	None	Completely normal, patient not disturbed
	Mild	Some symptoms but not amounting to illness
	Moderate or Severe	Clinically significant moderate or severe psychological or emotional disturbance

Please turn over

Study Surgery GP Record Sheet

1. Appt no	2. Practice Patient ID	3. >=16 yrs? ✓/✗	4. How much of the consultation today was spent discussing psychological or emotional issues?					5. Do you think this patient is suffering from a psychological or emotional disturbance?				6. How well do you know this patient?				
			None	Some	About half	Most	All	None	Mild	Moderate	Severe	Not at all	A little	Quite Well	Well	Very well
1			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
2			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
3			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
4			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
5			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
6			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
7			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4
8			☐0	☐1	☐2	☐3	☐4	☐0	☐1	☐2	☐3	☐0	☐1	☐2	☐3	☐4

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