

Patient centred approaches to health care: A systematic review of randomized
controlled trials

Abstract

There is growing interest in patient centred care, but there is little guidance about the interventions required for its delivery and whether it leads to better health outcomes. This systematic review evaluates the efficacy of patient centred care interventions for people with chronic conditions. Thirty randomised controlled trials were identified from health-related databases. The findings indicated that most interventions were based on the notion of empowering care and included attempts to educate consumers or prompt them about how to manage a health consultation. Other common interventions focused on training providers in delivering empowering care. Although it was difficult to draw firm conclusions because of the moderate to high risk of bias of the research designs, this review has shown some promising findings from implementing a patient centred care approach. There appeared to be benefits associated with this model of care in terms of patient satisfaction and perceived quality of care.

Keywords: Systematic review; patient centred care; chronic disease; intervention

Patient Centred approaches to Health Care: A systematic review of randomized controlled trials

The notion of patient-centred care (PCC) has been a feature in the healthcare sector since the 1950s (Bauman, Fardy, and Harris 2003). However, there has been a significant rise in its popularity over the last fifteen years, presumably as health systems seek solutions to the challenges they face in contemporary society. Although many definitions of PCC exist in the literature (Little et al. 2001; Mead and Bower 2002; Institute of Medicine (2001)), it is generally described as an approach to care that meets the specific needs, values and beliefs of patients. This approach is now acknowledged as a requirement for the delivery of safe and high-quality health care that can address the demands created by an ageing population and increasing rates of chronic conditions (Luxford, Piper, Dunbar, and Poole 2010; Institute of Medicine (2001); Department of Health (2010)). However, it remains poorly understood and is described using a range of terminology that has different meanings for different professionals (Bauman, Fardy, and Harris 2003; Stewart 2001; Mead and Bower 2002). Terms such as person-centred, client-centred, consumer-centred, user-centred, individual-centred or family-centred care are often used interchangeably, leading to confusion and barriers to practice.

In an attempt to synthesise the literature and address this confusion, several conceptual analyses have been conducted over the last decade or so (Leplege et al. 2007; McCormack and McCance 2006; Mead and Bower 2000; Hughes, Bamford, and May 2008), each resulting in frameworks or typologies that aim to inform practitioners about the key elements of PCC and its expected outcomes. Although useful, most reviews have failed to draw solid conclusions about whether or not PCC positively impacts on health outcomes for people with chronic conditions. This situation is likely to be associated with the multitude of

ways in which PCC has been operationalized and the predominance of empirical studies in this complex area. In a recent review of PCC (Rathert, Wyrwich, & Boren, 2012), it was concluded that future research should examine the specific dimensions of PCC and how they each relate to outcomes. Our review applies an existing framework (Morgan & Yoder, 2012) to categorize the domains of PCC and relate them to the expected outcomes. We have also classified PCC interventions by the type of activity that was implemented to address variability in the operationalization of PCC. Finally, to clarify the outcomes associated with PCC interventions, our review has focused only on randomized controlled trials (RCTs). Although less well controlled studies, i.e. non-RCTs, are equally valuable, RCTs are considered more rigorous as they are able to test whether a cause-effect relationship exists between variables (Sibbald and Roland 1998). The findings of this review will support health professionals to develop effective and targeted PCC strategies that can better assist people with chronic conditions in the future.

New Contribution

Although there are a considerable number of concept analyses (Hughes, Bamford, and May 2008; Leplege et al. 2007; McCormack and McCance 2006; Mead and Bower 2000; Morgan and Yoder 2012) and reviews of PCC (Mead and Bower 2002; Lewin, Skea, Entwistle, Zwarenstein, and Dick 2001; Amati, McDonald, Majeed, Dubois, and Rawaf 2012; Rathert, Wyrwich, and Boren 2012), there is no systematic review to our knowledge that focuses on the benefits of PCC for people with chronic conditions. Furthermore, despite a vast amount of literature on the topic of PCC, little is known about which elements of this complex intervention are effective, under what conditions and in relation to which outcomes. Therefore, the purpose of this review was to synthesize the RCTs that have been conducted in

this area, with specific reference to the intervention type, the attributes of PCC that have been operationalized and the types of outcomes that have been achieved.

Conceptual Framework

The model used to guide this systematic review was based on the most recent concept analysis of PCC conducted by Morgan and Yoder (2012). By examining all preceding descriptions of PCC across a range of contexts, Morgan and Yoder (2012) developed a higher-order model of PCC consisting of four key attributes:

- **Holistic care:** Recognises and values the whole person and responds to his or her complete needs in context, i.e. simultaneous assessment of physical, cognitive and psycho-social functioning, addressing situational, family, cultural and/or religious needs.
- **Individualized care:** Considers the individual's unique needs, preferences, personality and specific health concerns, i.e. development of an individual care plan.
- **Respectful care:** Recognises individuals as active health consumers and supports their strengths, abilities and preferences, i.e. listening to and supporting people's wishes or goals.
- **Empowering care:** Encourages autonomy, self-confidence and self-determination, facilitates a person's participation in decision-making through effective communication and negotiation, i.e. development of an action plan, assisting people to monitor their condition(s) and make changes to their treatment plan.

Although Morgan and Yoder (2012) provided a useful framework for describing the attributes of PCC, the importance of each element in improving consumer outcomes is not known. Indeed, Morgan and Yoder (2012) commented on the lack of clarity in the literature about whether the implementation of PCC was actually beneficial to consumers. In

discussing this lack of evidence, Rathert et al. (2012) noted that the way in which PCC was delivered could influence the efficacy of the intervention, irrespective of which dimension was applied. For instance, they speculated that interventions involving direct personal contact with patients through emotionally supportive interactions may be associated with better outcomes. Methodologically, interventions in which a “direct contact” intervention is systematically designed and delivered are likely to offer higher levels of implementation fidelity. In contrast, interventions that involve general training of the existing workforce rely solely on the ability and willingness of that workforce to actually translate the learned changes into new practices.

Thus, our framework included a distinction between direct contact interventions and training interventions. However, direct interventions can be either complex, i.e. involving multiple components, or simple, i.e. involving only one new tool or process. Thus, our framework included three main categories of intervention type, i.e. complex and direct, simple and direct or training and indirect. As RCTs may not involve an actual manipulation of behaviour, a fourth category was included, i.e. observational study. The four categories were defined as:

- Complex intervention: consisted of a number of components, i.e. provision of a tailored action plan, service referrals, follow-ups and feedback, possibly by a new service provider.
- Simple intervention: the manipulation of one environmental condition to facilitate a different style of interaction between patients and existing health care providers, i.e. provision of medical record and treatment plan for discussion, lists of questions for patients to ask providers.

- Training: the delivery of skills or knowledge to existing health care providers about PCC to apply within their usual practice, i.e. communication workshops to develop listening skills, presentations on shared-decision making and cultural competency.
- Observational: patients or health professionals view interactions between patients and health providers that either occur naturally or involve scripted vignettes and then rate the quality of the interactions or care provided to the patients.

In terms of outcomes, Morgan and Yoder (2012) reported frequent anecdotal reference in the literature to three major outcomes of PCC: (1) increased satisfaction with health care, (2) greater perceived quality of care and (3) improved health outcomes. Thus, the framework adopted in this study included four attributes of PCC, four intervention types and three main outcomes (Figure 1). As will be described in the method section, we used this framework as a classification system for the RCTs to facilitate our analysis.

[INSERT FIGURE 1 APPROXIMATELY HERE]

Method

An initial search of the literature was conducted using all terminological variants of patient-centred care, i.e. client-, person-, relationship- and family-. We noted that different terminology tended to reflect different sectors, i.e. healthcare, education and disability studies. In the healthcare arena, the term patient-centred care was most commonly used and was therefore selected for this review.

A systematic search was conducted in March 2013 using the following search terms: [chronic disease (OR chronic illness)] AND [patient centred care (OR patient centered care)]. Primary health sector databases were searched: Ovid Medline, PsychExtra, PsychInfo, Health Reference Centre Academic, Cochrane, Informit, Scopus, Embase and Cinahl. No other

inclusion criteria were used for the initial search to ensure broad capture of all potentially relevant articles. However, only studies with abstracts printed in English were included, which resulted in 1555 abstracts. All steps in the exclusion, inclusion and analysis of these abstracts were conducted by at least two independent researchers (SM, MK or AS) and checked by a senior researcher (EK). A large number of abstracts were initially excluded because they did not appear to be related to healthcare or human participants. Following initial exclusion, 259 articles were read, leading to the exclusion of a further 230 articles because they were not based on data and not RCTs, i.e. anecdotal, observational, opinion, did not measure relevant outcomes for patients or did not operationalize any of the PCC domains.

The 29 remaining articles resulted in 30 RCTs as one of the articles contained two RCTs, both of which were included in the analysis. Five of these articles reported different sub-studies drawn from two major studies, but as they focused on different variables, all were included in the analysis. The RCTs focused on a range of populations and disease states and were conducted in a range of countries between 1985 and 2012.

Given the small number of RCTs identified, no further attempt was made to restrict the sample on the basis of quality. However, the studies were graded in terms of “risk of bias” using the Cochrane Risk of Bias tool (Liberati et al. 2009), referred to in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher, Liberati, Tetzlaff, and Altman 2009). As there is considerable debate about the process of assessing study quality (Juni, Altman, & Eggar, 2001), our approach was to focus on the most tangible features of the studies that could bias the findings. Specifically, the RCTs were checked for sequence generation, i.e. how randomisation occurred, allocation concealment, finding, incomplete outcome data, i.e. significant loss to follow up, and selective outcome reporting. Other potential sources of bias were also considered in our interpretation of the findings, but a bias score, i.e. high, moderate or low risk, was allocated on the basis of these

major dimensions. For example, a study with a small sample size and significant drop out rate was classified as having a high risk of bias. A limited number of low risk ($n=5$) to moderate risk ($n=8$) studies were identified, with the majority of RCTs being evaluated as having high risk of bias ($n=17$). This situation is not unexpected in this complex area where the ability to control research environments is restricted.

The studies were then categorized according to the PCC dimensions that featured in the intervention, the type of intervention and the nature of the outcomes that were measured in the study, i.e. satisfaction, perceived quality of care or health outcomes. Nine interventions demonstrated only one attribute of PCC, ten contained two attributes, five contained three attributes and six interventions contained all four attributes. The most common attribute of PCC was empowerment ($n=25$). Fifteen interventions featured respect, 16 individualized care, and 12 holistic care. In terms of type of PCC intervention, the studies were coded as complex interventions ($n=16$); simple interventions ($n=7$); training interventions ($n=12$; 6 of which were embedded within a complex intervention and were therefore coded twice) or observational studies ($n=1$). The outcomes were well represented across the studies, with 22 RCTs providing only one of the three outcomes, six containing two outcomes and two containing all three outcomes.

Although the RCTs provided sufficient data to support the application of statistical meta-analysis, they were too heterogeneous in their focus, methods and outcome measures to ensure a reliable analysis. Thus, the review was conducted using a narrative synthesis. Table 1 summarizes key features of the RCTs identified in this study. The discussion below is organized around the three outcome categories that were of interest to this study (patient satisfaction, perceived quality of care and health outcomes).

[INSERT TABLE 1 APPROXIMATELY HERE]

Results

Patient Satisfaction

Fourteen studies focused on patient satisfaction, with either treatment or the outcomes of treatment, following a PCC intervention. Improved patient satisfaction was demonstrated in seven of these studies, the majority ($n=6$) of which involved an empowering intervention (Egan, Kessler, Laporte, Metcalfe, and Carter 2007; Maly, Bourque, and Engelhardt 1999; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Saha and Beach 2011; Evans, Kiellerup, Stanley, Burrows, and Sweet 1987; Thompson, Nanni, and Schwankovsky 1990; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998). Three of these studies contained interventions that focused on training existing health professionals to deliver PCC (Evans, Kiellerup, Stanley, Burrows, and Sweet 1987; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998), but many studies included training as part of a broader intervention, either directly training providers or indirectly influencing providers by training patients. One other non-training study, Saha and Beach (2011), randomized participants to watch either high or low patient-centred vignettes that portrayed different styles of doctor behavior. Doctors portrayed as being highly patient-centred were considered by patients to be more trustworthy than those who were low in patient-centredness. Participants stated that they were more likely to follow recommendations given by the patient-centred doctors and reported that they would be more satisfied and comfortable with the interaction.

Only two of the studies had a minimal risk of bias (Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999), both finding that intervention patients reported better communication with their doctor and increased treatment satisfaction compared to the control group. Intervention patients rated their care more positively than control group participants.

The remaining five studies with higher risk of bias all found statistically significant improvements in satisfaction. Two studies, Maly et al. (1999) and Thompson et al.'s (1990) study 2 used a simple intervention designed to enhance patient ability to communicate actively with the doctor. Given that complete blinding of experimental conditions was not possible, there was a potential that doctors were inadvertently “coached” to treat intervention clients differently. Nevertheless, these studies confirmed that altering provider behaviour to support empowerment of patients was a successful PCC strategy that resulted in enhanced patient satisfaction. Study 2 by Thompson et al. (1990) also found that patients were more satisfied with their consultation when they were less anxious, more confident in their ability to remember the information they received, and more familiar with the doctor, all of which are characteristic of a state of empowerment. The only complex intervention (Egan, Kessler, Laporte, Metcalfe, and Carter 2007), which contained all four dimensions of PCC, also resulted in increased patient satisfaction. However, study findings discussed above suggest that less complex interventions can achieve the same result, presumably at much less expense.

The seven studies that failed to find significant changes in patient satisfaction for intervention groups relative to control groups included four complex interventions and three simple interventions, all focused on empowerment (Kennedy et al. 2004; Garcia-Aymerich et al. 2007; Green et al. 2008; Thompson, Nanni, and Schwankovsky 1990; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Greenfield, Kaplan, and Ware 1985; Dobscha et al. 2009). Four of these studies were identified as being at high risk of bias and only Green et al. (2008) was a low risk study. This study involved a complex intervention where one patient group was given access to a web-based clinical pharmacist, and control group patients were advised to work with their doctors to improve their blood pressure. The lack of significant difference between control and intervention patients could have been attributed to the fact that control

patients also had the opportunity to discuss concerns and care plans with a health professional. Hence, any circumstance that encourages positive personal contact with a health professional may be sufficient to increase patient satisfaction.

The complex interventions (Dobscha et al. 2009; Garcia-Aymerich et al. 2007; Green et al. 2008; Kennedy et al. 2004) all focused on empowering and individualized care, and failed to generate any improvements in patient satisfaction. Importantly, Kennedy et al. (2004) did not include a full randomization process in that the delivery of the intervention was dependent on whether the doctor believed that the patient was a suitable candidate. Thus, the intervention was potentially biased by the doctor's beliefs, and perhaps by the existing quality of the doctor-patient relationship. Garcia-Aymerich et al. (2007) used only a small sample that may have reduced power to detect any effects. Furthermore, complex interventions are difficult to control and the bias inherent in these designs may, therefore, obscure positive effects. Thus, the finding that complex interventions were not successful cannot be fully supported.

Although the patient-centred vignettes used in the Saha and Beach (2011) study were slightly longer in duration than the control vignettes and the former led to higher levels of satisfaction, the simple intervention conducted by Maly et al. (1999) demonstrated that higher levels of satisfaction were not necessarily associated with longer duration encounters. In contrast, the simple intervention conducted by Greenfield et al. (1985) revealed no significant difference in either patient satisfaction or consultation time between intervention and control groups. Increases in satisfaction were found when patients were prompted to actively engage in the consultation rather than simply being given information. Thus, it is possible that patient satisfaction is inherently linked to active involvement in the healthcare process, even if this engagement occurs as a result of a simple procedural change.

Perceived Quality of Care

Eleven studies focused on quality of care, using a mixture of generic (i.e. physician satisfaction questionnaire) and specific measures (i.e. Patient Assessment of Chronic Illness Care [PACIC] instrument) (Sullivan, Leigh, and Gaster 2006; Boulton et al. 2008; Boyd et al. 2009; Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Marsteller et al. 2010; Saha and Beach 2011; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Nygardh, Malm, Wikby, and Ahlstrom 2012; Wagner et al. 2012). The studies typically focused on improvements in tangible aspects of care (as rated by either patients or providers) following complex interventions that usually involved training. It was difficult to determine whether or not the training interventions translated into actual care delivery, given that none included a manipulation check (i.e. a measure to see if the independent variable had the intended effect) (Gravetter and Forzano, 2012). Most interventions focused on empowering and respectful care, although three focused only on holistic care (Boulton et al. 2008; Boyd et al. 2009; Marsteller et al. 2010). Although not focused on a complex or simple intervention, Saha and Beach (2011) also found that doctors in the high patient-centred vignettes were rated as being more competent and likely to provide higher quality care than those in the control vignettes. The patient-centred vignettes were specifically designed to convey this approach via partnership and rapport building, with doctors exploring the individual concerns and needs of patients. There was also a focus on verbal and non-verbal communication, i.e. the provision of non-medical jargon and empathy. All the interventions demonstrated significant improvements in quality of care, although four revealed mixed findings as there were improvements in some but not all measures (Marsteller et al. 2010; Sullivan, Leigh, and Gaster 2006; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Wagner et al. 2012). All but two studies (Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998;

Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999) had a high or moderate risk of bias.

Four studies reported improved quality of care as rated by patients (Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Boulton et al. 2008; Boyd et al. 2009; Nygardh, Malm, Wikby, and Ahlstrom 2012). Specifically, patients reported improved levels of communication, coordination and decision-making. Woodcock et al. (1999) assessed both patient and provider perceptions of quality and found that intervention patients described the care they received as consisting of more positive qualities and better communication following the training intervention. However, the trained nurses who delivered the intervention reported being less satisfied with the style of care they delivered in the experimental condition. The authors concluded that, following training, the nurses may have doubted their ability to deliver their newly acquired skills and, hence, did not rate their performance highly. It is possible that training raised awareness of new practices and philosophies in a way that encouraged providers to be more critical of their performance until such time as they mastered the new skill.

Two other studies (Marsteller et al. 2010; Sullivan, Leigh, and Gaster 2006) found improvements in some aspects of care quality as rated by providers. Specifically, providers who received training were more likely than control providers to feel competent, capable and knowledgeable, and reported more appropriate use of time, positive relationships with patients and agreement about care. However, other features of care did not significantly improve, such as receptiveness to patients, information provision, satisfaction with the management of care, knowledge about patients' circumstances and interactions with specialists.

Three studies used a simple intervention (Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Wagner et al. 2012). The first two focused

on empowering patients by increasing their capacity to engage with providers. Both studies used an objective assessment of care quality, based on external assessment of consultation recordings, and found that the intervention patients were more active, i.e. they asked more questions, and the doctors were less controlling of the interaction, i.e. a reduction in the traditional communication pattern. The two studies also observed patient-reported improvements in the quality of healthcare interactions, even though there was no change in patient satisfaction. The study by Wagner et al. (2012) also focused on empowering patients to utilise their own personal health record, but found only limited improvement in perceived quality of care. Authors for this third study emphasised that the role of health care records in improving the quality of healthcare needs further investigation.

In summary, it appeared that training of providers contributed to increased quality of care as perceived by both providers and patients. Specifically, care appeared to be more coordinated, competent and collegial following training. However, care was also improved by simple changes in the patient's capacity to engage with the provider.

Health Outcomes.

Health outcomes were categorized into clinical outcomes, i.e. those based on tangible clinical measurement, functional outcomes, i.e. subjective performance-based outcomes such as activities of daily living and emotional wellbeing, personal outcomes, i.e. self-management skills and patient activation, and system outcomes, i.e. level of service usage and costs of healthcare. Twenty-one studies included health outcome measurements, with six focused on clinical outcomes (Garcia-Aymerich et al. 2007; Green et al. 2008; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Wagner et al. 2012), twelve focused on functional/emotional outcomes (Simon, Ludman, Bauer, Unutzer, and

Operskalski 2006; Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995; Dobscha et al. 2009; Munoz Alamo, Ruiz Moral, and Perula de Torres 2002; Bakitas et al. 2009; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Davison and Degner 1997; Nygardh, Malm, Wikby, and Ahlstrom 2012; Nijhof, Bleijenberg, Uiterwaal, Kimpen, and van de Putte 2012), fourteen on personal outcomes (Davison and Degner 1997; Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Thompson, Nanni, and Schwankovsky 1990; Boyd et al. 2009; Briggs, Kirchhoff, Hammes, Song, and Colvin 2004; Maly, Bourque, and Engelhardt 1999; Garcia-Aymerich et al. 2007; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; McWilliam et al. 1999; Nygardh, Malm, Wikby, and Ahlstrom 2012; Wagner et al. 2012), and eight on system outcomes (Green et al. 2008; Battersby et al. 2007; Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995; Dobscha et al. 2009; Bakitas et al. 2009; Casas et al. 2006; Simon, Ludman, Bauer, Unutzer, and Operskalski 2006; Wagner et al. 2012).

Clinical Outcomes.

In terms of clinical measurements, such as blood pressure and diabetic control, all studies involved empowering and respectful care interventions, except Garcia-Aymerich et al. (2007) which involved an empowering and individualized care intervention, and Wagner et al. (2012) which focused on empowerment. Three studies had a low risk of bias (Green et al. 2008; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999). The only simple intervention, which was designed to encourage patients to ask questions, showed subsequent improvements in HbA1c (Greenfield, Kaplan, Ware, Yano, and Frank 1988). Wagner et al. (2012) allowed intervention patients to

contact their physician online, via a nurse, when required, but found no significant change in blood pressure scores compared to the control group. Given that approximately one-third of intervention patients in the study by Wagner et al. (2012) did not utilise their health care records after initial training, it is not surprising that this intervention failed to have any impact.

Two training interventions demonstrated no change, or a deterioration relative to the control group in HbA1c levels, blood cholesterol concentrations, triglycerides and weight/BMI (Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999). Two complex interventions revealed mixed findings (Garcia-Aymerich et al. 2007; Green et al. 2008), with improvements in systolic blood pressure, hypertension management and pulmonary function after six months, but not in lung function or BMI. In relation to the negative findings of weight gain in the intervention participants, Kinmonth et al. (1998) noted that intensive diabetic treatment can contribute to weight gain, suggesting that increased adherence to medication routines, i.e. a positive outcome, in their intervention group may have had a negative impact on BMI.

These findings suggest that PCC may have little impact on clinical outcomes. Training of health providers is unlikely to be effective, but simple interventions designed to increase empowerment and active engagement during the medical decision-making process may have a positive impact, presumably by influencing the level of general patient engagement. Complex interventions resulted in mixed findings, with improvements in some clinical indicators and a negative impact on others. These findings highlight the complexity of managing chronic conditions and the importance of patient engagement in the process of achieving good clinical outcomes.

Functional Outcomes.

Overall, twelve studies focused on functional outcomes, nine of which identified positive impacts. Of the nine studies, seven showed an improvement in mental/emotional wellbeing (Bakitas et al. 2009; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Munoz Alamo, Ruiz Moral, and Perula de Torres 2002; Simon, Ludman, Bauer, Unutzer, and Operskalski 2006; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995; Dobscha et al. 2009) and seven showed improvements in physical symptoms or independence (Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995; Munoz Alamo, Ruiz Moral, and Perula de Torres 2002; Simon, Ludman, Bauer, Unutzer, and Operskalski 2006; Bakitas et al. 2009; Nijhof, Bleijenberg, Uiterwaal, Kimpen, and van de Putte 2012). Empowering care featured in all but one of these interventions (Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995), which focused on a complex holistic and individualized care intervention.

One study that failed to demonstrate emotional improvements (Davison and Degner 1997) involved a simple intervention, whereas successful interventions mostly involved training for providers or the introduction of trained nurses. There was some evidence that emotional improvements were long lasting in two such studies (Munoz Alamo, Ruiz Moral, and Perula de Torres 2002; Dobscha et al. 2009). Two other studies revealed mixed findings. For example, there were significant improvements in the frequency but not the intensity of depressive symptoms in Bakitas et al's (2009) study of cancer patients. Simon et al's (2006) study of people with bipolar disorder showed significant improvements for mania, but not for depression. These study discrepancies were attributed to the difficulty associated with improving outcomes in palliative care populations, such as cancer patients (Bakitas et al. 2009) and the differential effectiveness of pharmaceutical treatments for different disorders (Simon, Ludman, Bauer, Unutzer, and Operskalski 2006).

The five studies that identified some improvement in performance of activities of daily living or physical health focused on patients with peptic ulcers (Greenfield, Kaplan, and Ware 1985), diabetes (Greenfield, Kaplan, Ware, Yano, and Frank 1988), chronic musculoskeletal disorder (Munoz Alamo, Ruiz Moral, and Perula de Torres 2002), chronic fatigue syndrome (Nijhof, Bleijenberg, Uiterwaal, Kimpen, and van de Putte 2012) and elderly patients following discharge from an acute care unit (Landefeld, Palmer, Kresevic, Fortinsky, and Kowal 1995). In these studies, intervention patients reported better overall health status, improved functioning and independence and fewer physical and role limitations, particularly if they were more actively involved in their care. These interventions involved targeted modifications of patients' environments to enhance their access to supports for functional capacity, or to prompt their engagement in medical care, with the exception of Muñoz Alamo et al. (2002), which was a training intervention for doctors..

The positive findings revealed by Muñoz Alamo et al. (2002) only pertained to the number of tender points reported by patients with musculoskeletal pain. Broader functional outcomes, such as mobility, energy and social isolation were not statistically significant. Also, other indicators of functional improvements, including pain intensity and sleep quality remained unimproved. There was also no improvement in self-reported health status for patients with chronic kidney disease in the training intervention by Nygardh et al. (2012). These findings suggest that training and education are insufficient to bring about functional changes. However, a study with low risk of bias (Nijhof, Bleijenberg, Uiterwaal, Kimpen, and van de Putte 2012) demonstrated that online education and support for adolescents with chronic fatigue syndrome can lead to physical improvements, i.e. fatigue severity and physical functioning. These positive changes were maintained at the 12 month follow up suggesting a sustained impact.

In contrast, the positive changes identified by Landefeld et al. (1995) disappeared after three months, suggesting that it may be unreasonable to expect long-term benefits from a brief intervention without ongoing support. Thus, the conclusions that can be drawn in relation to functional outcomes are that simple targeted PCC interventions that enhance support and encourage patient engagement may have the potential to improve physical independence, but perhaps not in the long-term if they are brief interventions. PCC appears unable to influence physical symptoms, such as sleep quality, pain and intensity of symptoms. Empowering providers, however, appears to have a positive impact on patient emotional wellbeing.

Personal Outcomes.

Fourteen studies focused on personal outcomes that involved changes in patients' ways of knowing, thinking or perceiving their circumstances and engaging with their healthcare (Garcia-Aymerich et al. 2007; Greenfield, Kaplan, and Ware 1985; Greenfield, Kaplan, Ware, Yano, and Frank 1988; Kinmonth, Woodcock, Griffin, Spiegel, and Campbell 1998; Thompson, Nanni, and Schwankovsky 1990; Woodcock, Kinmonth, Campbell, Griffin, and Spiegel 1999; McWilliam et al. 1999; Maly, Bourque, and Engelhardt 1999; Briggs, Kirchhoff, Hammes, Song, and Colvin 2004; Boyd et al. 2009; Davison and Degner 1997; Kennedy et al. 2004; Nygardh, Malm, Wikby, and Ahlstrom 2012; Wagner et al. 2012). These studies focused on the level of knowledge and understanding people reported having about their condition, the confidence they felt regarding its management, and their desire to be actively involved in their own treatment or to change the way they took care of their disease. In most studies, researchers suggested that these outcomes might be moderators or mediators of other outcomes, indicating the possibility that they could represent the

mechanism by which PCC influences more tangible outcomes. However, no studies directly tested this assumption, and thus, these conclusions cannot be drawn.

Eleven of the twelve studies demonstrated improvements in personal outcomes. Specifically, Davidson and Degner (1997) found no difference in the desire to be involved in treatment decision-making, but did find an improvement in the level of active involvement in healthcare following a simple empowering and respectful care intervention. The majority of men with prostate cancer in this study utilised all or some of the information that was provided.

A similar simple patient empowerment intervention conducted by Greenfield et al. (1985) demonstrated an increase in preference for involvement in health care decisions and in the number of questions asked by patients. Although there was no difference in acquired diabetes knowledge between groups, intervention diabetic patients were more active in their care and twice as effective at eliciting the necessary information according to Greenfield et al. (1988). The two studies conducted by Thompson et al. (1990) also found that patients were more likely to ask questions in consultations, and reported higher levels of perceived control. The complex guided care approach of Boyd et al. (2009) that involved training of providers resulted in improved levels of patient activation at 18 month follow-up, and the complex training intervention by Kennedy et al. (2004) also demonstrated higher enablement scores. Furthermore, patients who were treated by intervention staff trained in empowerment in Nygardh et al. (2012) were more likely than those in the control condition to believe it was worthwhile to change the way in which they managed their chronic kidney disease.

Intervention patients reported less decisional conflict in terms of their treatment following a complex intervention that addressed all domains of PCC (Briggs, Kirchhoff, Hammes, Song, and Colvin 2004). Intervention patients in Maly et al. (1999) and 'study 2' by Thompson et al. (1990) felt less apprehensive about seeing their progress notes and were

significantly more likely to seek information compared to the control groups. However, as these researchers did not assess the patient's actual knowledge of their condition or its management, conclusions could not be drawn as to the impact of this information. In this regard, Garcia-Aymerich et al. (2007) demonstrated an increase in disease-specific knowledge following self-management education, an individually tailored care plan and follow up assessments. However, this study found no improvement in lung functioning to accompany increased knowledge, leading to the conclusion that more tangible benefits may be seen over time as participants gained more control over their condition.

In contrast to these findings, there was no increase in patient activation in Wagner et al. (2012) or in perceived control in Kinmonth et al. (1998) following a PCC training intervention for GPs and practice nurses. These findings were consistent with Woodcock et al. (1999) who focused on different data from the same study; patients had significantly less diabetes knowledge compared to the control group. The authors speculated that the delivery of PCC interventions may allow less time for the delivery of disease specific information because practitioners focus more on patient-driven concerns. However, a significantly reduced desire for information was identified in the intervention group compared to the control group at 22 weeks and one year following a complex empowering intervention conducted by McWilliam et al. (1999). The authors did not anticipate this outcome, but suggested that the patient-centred approach may have actually met the information needs of the intervention participants.

System Outcomes.

Eight studies focused on system outcomes of some kind, although the conclusions were difficult to interpret. Intervention patients who were low users of their online health records had a higher number of hospital inpatient days than those who used their health

records (Wagner et al. 2012). However, this study had a moderate risk of bias due to the poor implementation of the intervention. In contrast, a low risk study (Bakitas et al. 2009) found no difference in survival rates following a PCC intervention for cancer patients and no decrease in hospitalisation or emergency department use, although it is not surprising that PCC might not influence the hospitalization of cancer patients. Further, according to Battersby et al. (2007), PCC interventions were generally too short to result in hospital avoidance even for those with chronic conditions. However, these authors did report increased access to and use of community and allied health services among intervention patients that was likely to have been facilitated by vigilant care coordinators who made appropriate referrals (Battersby et al. 2007).

In patients with respiratory conditions, however, Casas et al. (2006) did find a reduction in hospital admission rates and an increase in the duration of admission-free periods among intervention patients, with no commensurate increase in visits to the doctor. . Casas et al. (2006) concluded that their complex integrated care intervention with individualized education programs, access to specialized case managers and a web-based call centre, demonstrated potential for cost-containment, even though no economic evaluation of costs were actually conducted.

Intervention patients in the study conducted by Landefeld et al. (1995) also had shorter mean durations of hospital stay (one day) and did not use more services than the control group during the three months post-discharge. Furthermore, the authors confirmed that fewer acutely ill elderly patients were discharged to long-term institutional care compared to the control group, suggesting that PCC may contribute to more appropriate use of community resources as opposed to costly institutional resources. Green et al. (2008) confirmed that PCC resulted in reduced use of specialists and increased use of telephone consultations with community pharmacists, which were associated with improvements in

home medication management. However, no change was found in use of primary health care. Interestingly, Dobscha et al. (2009) also found no difference in the use of primary care, suggesting that this resource may be underutilized. Indeed, the study conducted by Simon et al. (2006) found improved medication usage yet no increase in the number of medication management visits for PCC intervention participants who suffered from bipolar, suggesting more positive attitudes towards medication use following complex PCC interventions.

Discussion

Although health professionals are now expected to adopt patient-centred approaches when caring for patients, there is a dearth of information about how to do so and the benefits of this model of care. This systematic review clarified the benefits that can be expected to accrue from specific components of PCC in relation to consumers with chronic conditions. The findings revealed some consistent patterns of findings across studies but in other cases, results were mixed, difficult to interpret, or based on moderate to high risk study designs. There was also a lack of detail of the interventions design in most of the included studies. These limitations need to be taken into account when considering the findings. Nevertheless, the findings appear to be promising. For example, the results from prior research suggest that simple empowerment interventions resulted in higher levels of patient satisfaction about their care, presumably because it also resulted in higher levels of engagement, need for information and knowledge about their conditions. Training for providers in PCC appeared to contribute to some aspects of care quality, more so from the patient's perspective. This was also demonstrated by the change in patient engagement during patient-centred consultations, i.e. more active participation in their care. Similarly, empowerment training for providers resulted in improved emotional outcomes for patients. Although empowering interventions that stimulated patient engagement in health care may contribute to functional outcomes,

such as better overall health status and fewer physical and role limitations, PCC as a model of care had little impact on clinical and functional outcomes, other than emotional well-being.

There was some evidence that the outcomes of PCC interventions might not be sustained over time. Trials of a longer duration to determine if the benefits of PCC are maintained are required. Furthermore, research is needed to determine whether or not the increase in community service use seen in some studies was appropriate or simply added extra cost to the overall system without significant health benefits.

Perhaps the most compelling conclusion in this review is that PCC interventions focused on training health professionals to improve their communication skills whilst directly engaging consumers in the decision making process held the most potential for improving patient engagement and satisfaction. These interventions appeared to influence the perception of the health provider as being competent and trustworthy, resulting in higher levels of agreement and concordance with provider recommendations. There was some evidence to suggest that facilitating a relationship with any provider could bring about similar benefits and the nature of patient-provider relationships requires further investigation to determine the level of communication required to facilitate positive outcomes.

The findings about improved personal outcomes, such as patient engagement, knowledge acquisition, self-management and confidence, were complex and mixed. Although the majority of studies identified positive changes in these areas, they failed to examine the potential role of these factors as mediators or moderators of other outcomes. The findings suggested that providing patients the opportunity to learn more about their health status, by giving information on their condition or their individual progress, or providing the opportunity to ask questions, can increase patient desire for knowledge. This may lead to an increase in actual knowledge which, over time, could be translated into more tangible outcomes. However, evidence did not exist that increased knowledge or self-management

ability resulted in an improvement in clinical indicators, particularly with short-term interventions. Further research is needed to determine whether or not long-term benefits of PCC might be realized through the early prevention of emotional and functional deterioration.

Patients and providers appeared to perceive quality of care differently, even following the same intervention. In general, patients perceived higher quality care if there was better communication, a trusting relationship and active engagement between the provider and the patient which focused on the patient's needs. However, there were mixed results in relation to provider satisfaction with the care they delivered. Some trained providers reported greater clinical but not personal knowledge of their patients, i.e. more knowledge about the patient clinical characteristics versus personal circumstances, while others reported less satisfaction with the care provided. Consequently, this latter finding raises more questions because it was from a study identified as having a low risk of bias.

Importantly, the provision of PCC did not require longer consultation or appointment times, but required a qualitatively different interaction. The delivery of relatively minimal interventions could potentially increase appropriate service use and minimize costly overuse of treatments that are ultimately likely to result in higher levels of treatment burden for patients and their families. However, this review identified that short-term interventions are unlikely to bring about sustained improvements in clinical indicators. Conversely, it has been recognized in the primary care literature that brief interventions can result in more sustained effects, as identified by Kaner et al. (2007) in their review of brief alcohol interventions. Considering that time emerged as a barrier to the implementation of PCC, there is the need for further research into the effectiveness of brief PCC interventions for supporting consumers with chronic illness, particularly in primary care, which is an underutilized resource.

The studies that provided training to health care providers in PCC all assumed that changes in the provider's style of practice followed suit. Several studies demonstrated the flaw in this assumption, suggesting that more PCC did not automatically follow training. Nevertheless, training for health professionals in communication and shared-decision making was generally associated with improvements in satisfaction and perceived quality of care, at least from the patient's perspective. Furthermore, when patients were provided with an opportunity to actively participate in their health care, they appeared to build a trusting relationship with their providers. When negative clinical outcomes were reported, other factors may have contributed to these results, highlighting the complexity of providing health care for consumers with chronic illnesses.

This review represents the first systematic assessment of RCTs supporting the efficacy of interventions involving one or more of the following PCC attributes: holistic, empowering, respectful and individualising care (Morgan and Yoder 2012); specifically for people with chronic illnesses. Although some useful conclusions were drawn from this review, these are limited by variability in the definition of PCC, the outcome measures used and the lack of detail about the actual interventions in the studies. Despite selecting only RCTs, a high risk of bias was identified in most studies, reflecting the complexity of this field of research. Furthermore, the data were insufficient to examine the proposition that different types of PCC might be preferred by some types of patients in different circumstances, which could be a focus for future research.

Notwithstanding these limitations, this review has enabled some important patterns to emerge that should now be tested in more detail. There appear to be definite benefits to be derived from patient centred care delivery, particularly empowering interventions or training for providers to support their practice in this area.

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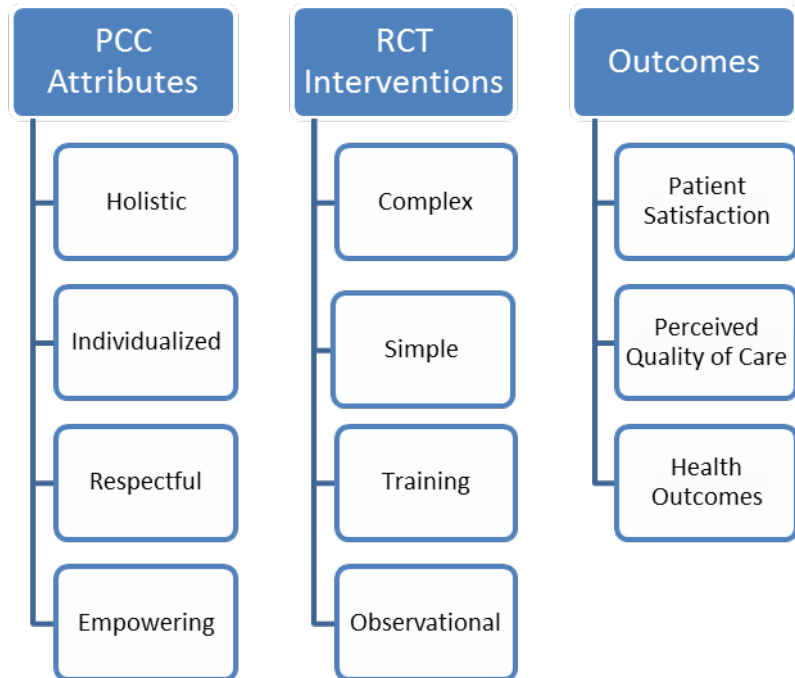


Figure 1. Conceptual model for systematic review

Table 1: Summary of RCTs

Author (Year)	Study Size N =(Intervention/ Control)	Intervention	Attributes	Bias	Outcome Measures and Findings
Bakitas et al. (2009)	161/ 161 Advanced cancer patients	Complex intervention Advanced practice nurse conducted four educational and problem-solving sessions, monthly telephone follow-ups and group shared appointments.	Empowerment, Holistic	Low	Edmonton Symptom Assessment Score: trend towards lower symptom intensity. Centre for Epidemiological Studies Depression Scale (CES-D): lower depressed mood. Service use: No group differences in survival, days in hospital and ICU or emergency department visits.
Battersby et al. (2007)	295 GPs, 4603 patients, 100 service coordinators 4 regional sub-trials: Central: 271/138 Southern: 887/427 Eyre: 1353/513 Western: 604/410 Chronic illness patients	Complex intervention Service coordinator used a problem and goals approach to develop a care plan and to assist with service access.	Empowerment, Holistic, Individualized, Respectful	High	Increased utilisation of community allied health services.
Boult et al. (2008)	7/7 teams from 8 practices	Complex intervention & training	Holistic	High	Patient Assessment of Chronic Illness Care (PACIC): twice as likely to rate overall quality of

49 physicians
7 nurse care
managers
485/419 multi
morbid older
adults

Nurse care managers completed an educational program on: comprehensive assessment, motivational interviewing, evidence based guidelines for chronic conditions, self-management, cultural competence, community resources, educating and supporting caregivers and using the guided care electronic health record. They then provided 8 clinical services: home assessment, care plan, action (self-care) plan, monitoring, self-management coaching, care coordination, hospital-community transitions, caregiver education and support, facilitating community resources.

care as high at 6 months for goal setting, coordination and decision support. Primary Care Provider Survey and Primary Care Assessment Tool: increased physician satisfaction for patient and carer communication and education, motivating patients and referrals to community resources. Increased knowledge of medication profile. Nurses' job satisfaction instrument: moderate-high satisfaction with model of care.

Boyd et al.
(2009)
Same study as
Boult *et al.*,
(2008) – 18
month outcomes

Complex intervention &
training

Holistic

High

PACIC: higher mean quality of care scores, with improvements in care coordination and decision support. Twice greater odds of rating their chronic care highly. Significant improvements in goal setting, coordination of care, problem solving, and patient

activation.

Briggs et al. (2004)	13/14 patient-surrogate pairs Advanced care patients	Complex intervention 1 hour interview: assess patient understanding of current medical condition and prognosis; explore misconceptions and rationale for advanced care planning, statement of treatment preferences survey and summary.	Empowerment, Respectful Holistic, Individualized	High	Higher congruence between patient and surrogate. Decreased patient decisional conflict regarding future medical treatment No group difference in patient and surrogates' knowledge of Advanced Care Planning. Higher quality of communication about end-of-life care.
Casas et al. (2006)	65/90 patients 2 tertiary hospitals (1 Belgium, 1 Spain) Patients with COPD	Complex intervention Individually tailored intervention (including 2 hour self-management education program and follow up phone calls). Specialised nurse case manager through a web-based call centre to arrange non-scheduled visits.	Individualized, Empowerment	Moderate	Fewer hospital re-admissions and higher rates of admission-free times. No group difference in the number of doctor visits
Davison and Degner (1997)	30/30 men with prostate cancer	Simple intervention Patients were asked to think about the type of information they needed to assist them in deciding treatment.	Empowerment, Respectful	High	Higher proportion of men assumed a more active role in treatment decision making in intervention group. Speilberger state anxiety inventory: higher state anxiety at pre-test and lower at 6 weeks. No group difference.

		Encouraged to participate in treatment decisions (with a question list) and to bring family to consult. Provided with audiotape.			Centre for Epidemiologic Studies Depression Scale: no. significant group difference.
Dobscha et al. (2009)	22/24 clinicians 187/214 chronic pain patients	Complex intervention & training Patient follow ups and information workshops with written information and a case manager assessment visit (identification of fear-avoidance beliefs, exploring treatment barriers, screening for comorbid psychiatric disorders, development of Individualized goals).	Empowerment, Holistic, Individualized	Moderate	Global VA Health Satisfaction: no group difference in ratings over 12 months. No differences for mental health or pain consultation service appointments or primary care visits. Improvements in pain-related disability and intensity. Patient Health Questionnaire: Greater improvements in intervention patients with depression.
Egan et al. (2007)	6/8 stroke patients	Complex intervention Up to 8 visits by occupational therapist to identify meaningful activities and goals.	Empowerment, Holistic, Individualized, Respectful	High	Canadian Occupational Performance Measure: increased satisfaction with performance.

Evans et al. (1987)	20/20 GPs 200/200 GP patients	Training GPs attended 2 three-hour communication seminars (focused on awareness and knowledge of potential communication problems in consultations).	Respectful	High	Doctor-patient communication survey: higher overall levels of satisfaction.
Garcia-Aymerich et al. (2007)	44/69 COPD patients Spanish Centre sub-study of Casas <i>et al.</i> (2006)	Complex intervention Comprehensive assessment, self-management education session, individually tailored care plan, follow ups, one home visit by care team, and access to call-centre.	Empowerment, Individualized	High	BMI: increased BMI. Pulmonary function tests: PaO2 levels improved after 6 months but worsened for control patients. Dyspnoea worsened slightly in both groups but no change in lung function. Satisfaction with health services: no group difference. Improved disease self-management (identification and treatment of exacerbation, correct inhaler technique).
Green et al. (2008)	258 usual care; 259 home BP monitoring and web training; 261 home BP monitoring, web training and web-based pharmacist care	Complex intervention Intervention groups received training in web-site use, home BP monitoring, educational material and encouragement to work with GP. Pharmacist care - an action plan for at least one patient selected goal. Patients encouraged to provide	Empowerment, Individualized, Respectful	Low	BP: no group difference between BP monitoring/web training and usual care but improvement in systolic measurements. Pharmacist care group had significantly better BP control, systolic BP and diastolic BP than usual care. BMI: No difference Consumer assessment of healthcare providers and systems instrument: no difference for satisfaction. Service use: significant decrease in percentage of specialist visits for pharmacy care group. No differences in primary care visits.

regular feedback until BP controlled with home monitor.

Greenfield et al. (1985)	23/22 patients with peptic ulcer disease	<p>Simple intervention</p> <p>Reviewed patient's medical record and treatment algorithm for chronic ulcer disease. Discussed behavioural change to encourage increased patient involvement. Patients given a copy of medical record and treatment algorithm. Both groups had 20 min consultation with clinic assistant (control group provided with disease information but not medical record or coaching).</p>	Empowerment, Respectful	Moderate	<p>Consultation times: no group difference.</p> <p>Audio recordings of consults: reduction in "traditional communication pattern" (i.e. doctor directs interaction and patient provides factual information).</p> <p>Increase in inter-personal involvement.</p> <p>Health Status (questionnaire): fewer physical and role limitations (i.e. work).</p> <p>Preference for active involvement (Questionnaire): increase in preference for involvement. Fewer role and physical limitations for patients who were more active.</p> <p>Patient satisfaction (Questionnaire): no group difference.</p>
Greenfield et al. (1988)	39/34 patients with diabetes	<p>Simple intervention</p> <p>Provided patient's medical record and encouraged patient's to use the information to ask questions. Rehearsed negotiating skills. Both groups had two, 20min sessions with clinic assistant</p>	Empowerment, Respectful	High	<p>Consultation times: no group difference.</p> <p>HbA1c: decrease HbA1c. Functional limitations index: improvements in mobility, role, and physical limitations.</p> <p>Audio recordings of consults: twice as effective in eliciting information from the doctor as the control group and more active during the visit.</p> <p>Patient satisfaction (Questionnaire): no group difference.</p>

(control group provided with educational material but not medical record or coaching).

Kennedy et al. (2004)	9/10 hospital sites 279/403 patients with Inflammatory Bowel Disease (IBD)	Complex intervention and training Negotiation of self-management plan with patient, direct access to services, provision of an information guidebook and a PCC approach to care by a trained clinician.	Empowerment, Individualized, Respectful	High	Consultation Satisfaction (Questionnaire): no group difference. Increased enablement score.
Kinmonth et al. (1998)	21/20 practices 23 Drs and 32 nurses/20 Drs and 32 nurses 142/108 patients with type 2 diabetes	Training Doctors and nurses received 0.5 day training (active listening and negotiation of behavioural change). Nurses also received a full day to practice skills. (Nurses in control group were offered similar support sessions on use of guidelines and materials).	Empowerment, Respectful	Low	More likely to report excellent communication with doctors and greater satisfaction with treatment. No group difference in agreement between patients and doctors on main concerns, perceived personal control. Wellbeing (Questionnaire): higher scores. HbA1c and total blood cholesterol concentration: no group difference. BMI and triglycerides: better scores for knowledge, BMI and Triglycerides in control group.
Landefeld et al. (1995)	327/324 acutely ill older patients	Complex intervention Specially prepared environment, PCC (daily	Holistic, Individualized	Moderate	Interviews (Functional Status): at discharge, improved ability to perform basic activities (i.e. bathing, dressing), higher (mean) number of activities performed.

assessment by nurse of cognitive, physical, psychosocial functioning, protocols to improve self-care, functioning, based on assessment. Daily rounds by multidisciplinary team), discharge planning, review of medical care.

More intervention patients improved, and fewer became worse, in the ability to bathe and dress during the admission to discharge period. Higher level of functioning at discharge compared to 2 weeks prior.
Fewer intervention patients were discharged to long term institutions vs. control group (p=0.01). No group difference in admission to long term institutions after discharge.
Mini Mental State Examination and Geriatric depression scale: improved health status but no difference in mental status or depression score when controlled for depression scores on admission. No group difference or change over time in functional status.
No group differences in mean number of activities of daily living performed or overall health status 3 months post-discharge. No group difference in number of paid health care services.

Maly et al. (1999)	134/131 health consumers with chronic illness	Simple intervention Recorded two questions for the doctor to review and supplied with medical progress notes. (Control group provided with health information only).	Empowerment, Individualized	High	Satisfaction: improved satisfaction with medical care. Duration of Patient-Physician encounter: no group difference. Visit length: no group difference. Increased interest in seeing medical records and higher propensity for health-information seeking.
Marsteller et al. (2010)	25/24 physicians Same study as Boulton <i>et al.</i>	Complex intervention and training Guided care model	Holistic	High	Primary Care Assessment Tool and Physician Questionnaire: more satisfied than control physicians with communicating with their older

(2008) and Boyd
et al. (2009) –
 focuses on
 physician
 satisfaction

chronically ill patients and families, and better
 knowledge of their patients' clinical
 characteristics after one year.
 No group differences at one year follow up for
 other variables (i.e. satisfaction with management
 of chronic care, knowledge of patient's personal
 circumstances, ratings of the practice's care
 coordination activities, time spent managing
 patients, knowing about specialist visits, sending
 information to specialists and receiving useful
 information from specialists).

McWilliam
 et al.
 (1999)

12-16 home
 visits (1 hour)
 with community
 nurse duration.

Complex intervention

Empowerment

Moderate

More independent, greater perceived ability to
 manage own health. No group difference for
 overall mindset (post-intervention and at 1 year).
 Reduced desire for more information compared to
 control group increase in desire at 22 weeks.
 Both groups experienced decreased hospital stays
 but no group differences in health resource
 utilisation.
 More independent and less in need of information
 at 1 year.
 Cost of the intervention was offset by the overall
 savings in the usual health services resource
 utilisation

Muñoz
 Alamo
 et al.
 (2002)

10/10 Drs
 63/47 patients
 with benign
 chronic
 musculoskeletal
 pain (CMP) and
 fibromyalgia (F).

Training

Doctors undertook
 communication skills
 training (appropriate
 communication, mutual
 discussion and partnership,

Empowerment,
 Holistic,
 Individualized,
 Respectful

High

Visual Analogue Scale: no group difference for
 pain intensity.
 Goldberg Scale of Anxiety and Depression:
 improvement after 1 year in psychological
 distress.
 Nottingham Health Profile (NHP Questionnaire):
 reduced number of tender points.

	13 health centres	provision of clear information, looking for common ground and avoiding saying there is anything wrong.).			Except for sleep, all other NHP-variables (i.e. physical mobility, energy, social isolation) showed improvement (but not significant). More pronounced improvements for patients with CMP than those with F.
Nijhof et al. (2012)	68/67 adolescents with chronic fatigue syndrome	Complex intervention Intervention group received support from cognitive behavioural psychotherapist via email and online, interactive modules. Parents followed a parallel program.	Empowerment, Individualized	Low	Checklist individual strength (CIS-20): less fatigued. Child health questionnaire (CHQ-CF87): increased levels of physical functioning. Sustainable treatment effects at 12 months for intervention patients who had recovered at 6 months.
Nygaardh et al. (2012)	25/21 patients with chronic kidney disease	Training Staff members completed a six step educational training program including: learning seminars, workshops to give high-quality care, quality improvement training, empowerment workshops, person-controlled education and reflection meetings.	Empowerment	High	Individualized Care Scale (ICS): more intervention patients were asked about their personal situation by staff. Ways of Coping Questionnaire-Swedish Version: higher levels of escape avoidance coping. Self-reported health status (EQ-5D): better scores at follow up for the control group
Saha and Beach (2011)	134/114 patients with or risk factors for Coronary Artery Disease	Observational Intervention patients viewed a vignette depicting a physician with high PCC	Empowerment, Holistic, Individualized, Respectful	Moderate	Post-vignette Questionnaire: intervention patients rated the doctor as more competent and trustworthy and the necessity of surgery higher than control patients. More likely to undergo the recommended surgery

	16 high and 16 low PCC vignettes	behaviour (control patients viewed a low PCC vignette). Videos were standardised for: doctor's rationale for recommendation, evidence of risks and benefits and strength of recommendation.			and felt they would be more comfortable with the doctor. Global ratings of high-PCC doctor were 22% higher. Level of PCC was not associated with patients wanting a 2 nd opinion but high PCC vignettes were longer in duration (average 5mins 20sec) than the low-PCC vignettes (average 4mins).
Simon et al. (2006)	212/229 patients with bipolar disorder	Complex intervention and training Assessment and care planning with the nurse (collaborative process), monthly follow up calls, structured feedback to mental health provider, structured group psycho-educational program, as needed support	Empowerment, Holistic, Individualized, Respectful	Moderate	Psychiatric Status Rating: lower mania scores at 24 month follow up. Lower duration of mania symptoms. No group difference for depression (frequency or severity) at follow up. No group difference for medication management visits.
Sullivan et al. (2006)	26/23 GPs	Training Two hour education session involving video presentations on the shared-decision making model and discussions. Both groups received an education pack (resources and treatment recommendations for chronic	Empowerment, Individualized, Respectful	High	Physician Satisfaction Questionnaire: increased satisfaction, relationship quality, appropriate use of time and patient-care agreements. Physician patient centredness measure: no group differences for overall patient centred score, doctor receptiveness, patient involvement and affective content of the relationship. More likely to provide information to patients and to complete patient-care agreements. Majority of intervention participants felt more competent to care for patients with chronic pain.

pain).

Thompson et al. (1990)	Study 1: 29/24 Obstetric and Gynaecological patients	Simple intervention Patients given a list of health concerns (i.e. breast exam) and asked to write down min. 3 questions for the doctor.	Empowerment	High	Family Practice Patient Questionnaire: no group difference in patient doctor satisfaction or length of visit. No group difference in number of questions asked. More likely than control group to ask all the questions they wished to ask. Family Practice Patient Questionnaire: higher visit satisfaction, higher perceptions of control.
	Study 2: N=18 (messages) N=13(list questions) N=18 (control)	Two interventions: one group were provided with a message that the doctor encouraged them to ask questions and a waiting room questionnaire. Second group were given a checklist of information (i.e., cause of problem) to be obtained during the visit instead of a general list of health topics	Empowerment	High	No differences between the two intervention groups. Patients were more satisfied with visit when they were less anxious, more confident, and when they had seen the doctor multiple times. Satisfaction was not significantly related to the number of questions patients wanted to or did ask.
Wagner et al. (2012)	194/252 Patients with hypertension	Simple intervention Intervention patients were provided with training and access to a personalised health care record (PHR). Patients could access educational material, health data, make goals, and securely message their	Empowerment	Moderate	No improvement in blood pressure, patient activation (Patient Activation Measure; PAMS), or satisfaction with care (Consumer Assessment of HealthCare Providers and Systems Clinician and Group Survey; CAHPS and PACIC). Higher provider communication and helpfulness scores, and a trend towards better diastolic blood pressure were associated with greater PHR use.

physician (these were triaged
by a nurse)

Woodcock et al. (1999)	22/21 practices 64 practice nurses and 43 GPs Same study as	Training	Empowerment, Individualized, Respectful	Low	Attitudes: time major constraint to using patient centred approach for both nurses and GPs. Control group nurses were significantly more likely to believe they should decide on the best course of action. Intervention group rated care more positively than control group. Behaviour: intervention nurses were significantly less satisfied than control nurses with their style of care but their patients were more satisfied. Patients reported that all aspects of care had been delivered more in intervention than control practices. They reported better communication with GP, greater satisfaction with treatment and greater well-being. However, they had higher triglyceride levels, were heavier 1 year after diagnosis and had significantly less knowledge about diabetes.
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