

Patient-reported outcome measures: clinical applications in the field of chronic pain self-management

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Summary

Chronic pain is a major influence on patient-reported quality of life. This chapter examines ways that information from patient-reported outcome measures (PROMs) can be translated into clinical practice to improve the management and self-management of chronic pain among people with rheumatic disorders and haemophilia. This includes: 1) evidence about how PROMs can be used to improve routine clinical practice and self-management programmes in rheumatic disorders and haemophilia; 2) evidence about a DVD intervention with patient perspectives about living and coping with chronic joint pain, which improved patient-reported readiness to self-manage pain; 3) evidence about pain acceptance and pain coping as influences on patient-reported quality of life among people with haemophilia; and 4) recommendations for clinical and treatment interventions to improve patient-reported outcomes for people with haemophilia-related joint pain.

Introduction

Patient-reported outcomes were defined as “*any report of the patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else*” (US Department of Health and Human Services Food and Drug Administration, 2006). Patient-reported outcome measures (PROMs) include validated questionnaire measures that assess the impact of disease and treatment from the perspective of the patient. PROMs were originally developed for group comparisons in clinical trials and population studies, and the results were used to support treatment recommendations or inform health policy, with no direct clinical benefit for the patients who reported the outcomes. However, as experience with PROMs increased, the clinical value of using individual PROM profiles in routine practice to identify and monitor symptoms, evaluate treatment outcomes and support shared decision-making became more apparent (Santana et al., 2015).

Using PROMs in this way could potentially improve the diagnosis of medical conditions and the recognition of problems, and improve patient-physician communication, but considerable work still needs to be done to ensure that PROMs are used systematically and consistently to achieve those benefits. The value of PROMs is increasingly recognized for patient-centred approaches to care, but more well-controlled trials are needed to inform the ways that clinicians use PROMs in clinical practice (Valderas, 2008). For example, identification of goals, selection of patients and measures, timing of assessments, interpretation of scores, development of strategies for responding to PROMs, and evaluation of the impact of PROM use were among the issues identified in the *User's Guide for Implementing Patient-Reported Outcomes Assessment in Clinical Practice* produced by the International Society for Quality of Life Research (Snyder et al., 2012).

In this chapter we consider how PROMs could be used to improve clinical care and promote greater patient self-management in two chronic pain conditions: rheumatic disorders and haemophilia. We first introduce the use of PROMs in routine clinical practice and explain their importance in self-management programs. We then discuss more specifically the role of PROMs in self-management of chronic pain, focusing specifically on pain coping and acceptance as influences on patient-reported quality of life, and discuss the importance of improving the use of PROMs among people with chronic painful conditions.

Using PROMs in routine clinical practice

Patient-reported outcome measures (PROMs) are especially important in the clinical management of chronic pain conditions because pain is a uniquely subjective phenomenon and patient self-management has an important influence on chronic pain treatment outcomes. In other medical contexts, PROMS have been used for screening, promoting patient-centred care, aiding decision-making, facilitating multidisciplinary communication, and monitoring the quality of patient care (Greenhalgh, 2009). Reviews of evidence about the use of PROMs concluded that they have been used more frequently and more effectively to detect and assess problems with patients' health-related quality of life than for patient management or to influence patient outcomes (Greenhalgh, 2009; Greenhalgh and Meadows, 1999). However, few of those studies included people with chronic pain conditions, and none to our knowledge involved people with haemophilia, who are mostly treated in specialist centres. In one review of 38 trials evaluating PROMs in clinical practice, 25 involved primary rather than specialist care, and 13 involved mental health problems. Only four of the trials involved patients with chronic illnesses, and none focused specifically on rheumatic disorders or haemophilia (Marshall et al., 2006).

However, several studies of PROMs have included aspects of pain management. One study evaluated an intervention for primary care patients with diverse pain and psychosocial problems, in which doctors received feedback about patients' problems and concerns. A nurse-educator then telephoned patients to teach problem-solving strategies and basic pain management skills, which led to improved outcomes (Ahles et al., 2006). Another study

showed that the use of patient health status assessment by primary care clinicians in a health maintenance organization led to improved patient ratings of the help they received with managing pain (Wasson et al., 1992).

Greenhalgh et al. (2005, p. 839) argued that for PROM-based interventions to be effective in routine clinical care, three implicit assumptions must be met: that patients want to talk about their health status with clinicians; that clinicians feel it is appropriate to discuss health-related quality of life issues with patients; and that clinicians see that information as sufficiently important to prompt changes in patients' treatment or management. Fung and Hays (2008) argued that making more use of PROMs, especially quality of life measures, can improve the quality of patient care, but that clinicians may not be motivated to make greater use of patient-reported measures, and that most health-related quality of life measures were developed for research rather than clinical practice.

Using PROMs in routine clinical practice for rheumatology

Rheumatic diseases affect the joints and muscles. Some, like osteoarthritis (OA), damage joint cartilage and, as the cartilage wears down, the joints hurt and become harder to move. OA 'flares' are painful exacerbations of inflammatory activity in the affected joints (Bingham et al., 2009). OA affects large numbers of people in the world and is one of the most common causes of pain, accounting for around 50% of clinical consultations for pain (Brooks, 2006).

Over the last 10 years, PROMs have been developed to assess symptoms associated with specific rheumatic conditions such as osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis, and specific patterns of symptoms, especially the 'flare'. This is important because whereas physicians are more likely to base treatment decision-making on objective changes, patients are more concerned about subjective changes such as pain, mood disturbance, or the need to seek help (Bingham et al., 2009). Organizations including the American College of Rheumatology, the European League against Rheumatism, and the Outcome Measures in Rheumatology (OMERACT) group, recommended considering both perspectives because they provide different but often complementary information (Sanderson et al., 2010). For example, a recently developed tool integrates patient and physician perspectives to assess current or recent rheumatoid arthritis flares, and is suitable for daily clinical practice to identify and monitor both transient and long lasting increases in rheumatoid arthritis symptoms (Berthelot et al., 2012).

Several tools have been used to measure health-related quality of life (HRQOL) among patients with osteoarthritis of the lower limbs and those undergoing total hip or knee surgery. The Medical Outcomes Study Short-Form 36 (SF36) has been widely applied but, as a generic instrument, tends to be less responsive than specific instruments, particularly in the context of medical or rehabilitation intervention rather than joint replacement. Comparisons of the SF36 with the disease-specific Western Ontario and McMaster Universities Arthritis Index (WOMAC) for patients undergoing knee replacement surgery reported that they measured different aspects of health and should probably be used together (Hawker et al., 1995). The

Arthritis Impact Measurement Scales (AIMS2) tool and its short form AIMS2-SF have been considered for use in osteoarthritis but have a limited usefulness among patients with a high prevalence of lower limb disability (Guillemin et al., 1997; Ren et al., 1999). Also, combining the SF36 with the WOMAC or the Lequesne index (Rat et al., 2005) may not capture specific aspects of HRQoL experienced by patients with osteoarthritic knee and hip problems, whereas the knee and hip osteoarthritis quality of life questionnaire (OAKHQOL) is specifically designed for that purpose (Rat et al., 2005).

Recently, Golightly et al. (2015) developed a list of recommended PROMs that could feasibly be applied in common clinical settings for the management of hip and knee osteoarthritis. Suitable PROMs were categorized across the four domains of pain, function, fatigue and sleep. The PROMs were also ranked into three tiers: 1) very brief measures for initial use in clinical settings; 2) brief measures with more in-depth assessment; 3) more detailed assessment. This three-tiered approach provides a basis for tools to systematically track outcomes, facilitate provider–patient dialogue, and guide treatment for hip or knee osteoarthritis. First, tier 1 measures, particularly for pain, can be used to detect early joint symptoms within primary care settings. Second, tiered PROMs provide a way to track symptoms over time and guide treatment among patients with established osteoarthritis. For example, tier 2 PROMs could detect emerging or advancing sleep problems, triggering referral to a specialist for additional evaluation or management. Third, tiered PROMs can be used to assess the effectiveness of new treatments. The recommended PROMs may serve as clinical tools to systematically screen for and monitor outcomes associated with knee or hip osteoarthritis, promote and support provider–patient dialogue about osteoarthritis-related outcomes, and guide osteoarthritis treatment.

In other work, a review of patient-centred care for rheumatoid arthritis (RA) concluded that fatigue should be included as a routine patient-reported outcome because of its significance to patients and its responsiveness to treatment (Matcham et al., 2015). The psychological correlates of fatigue include affect, mental disorders, RA-related cognitions, non-RA related cognitions, personality traits, stress, coping, social support and interpersonal relationships. Early identification and management may prevent acute fatigue from becoming chronic. There are a range of different patient-report measures of fatigue, which can be assessed when patients first present to primary and secondary care, and then continually monitored throughout the course of treatment (Matcham et al., 2015).

Personal factors such as self-efficacy, optimism, resilience and coping strategies are also important in the life stories of people with RA, but only 55% of PROMS covered personal factors (Dür et al., 2015). Coping strategies and reflecting about one’s life in an optimistic way were the personal factors covered most frequently, while job satisfaction was not covered by any PROM. Dur et al. concluded that when evaluating personal factors important to people with RA, health professionals should be alert to which PROMs can be used to assess which personal factors.

Using PROMs in routine clinical practice for haemophilia

Haemophilia is an inherited bleeding disorder caused by deficiencies of blood clotting factors. Haemophilia A (caused by factor VIII deficiency) and haemophilia B (caused by factor IX deficiency) are both sex-linked recessive disorders in which the classic pattern of transmission is from carrier mother to affected son. Haemophilia A affects about one in 5,000 males, and haemophilia B about one in 30,000 males (Kliegman, 2011). Prevalence rates vary considerably between countries and over time (Stonebraker et al., 2010), but in 2012 there were 6,742 people identified with haemophilia in the UK, 6,035 in France, 4,660 in Germany, and 18,628 in the USA (World Federation of Hemophilia, 2013).

People with haemophilia are susceptible to haemarthroses (joint bleeds), which happen when small blood vessels in the joint are ruptured and the joint space fills with blood, causing severe acute pain. Recurrent joint bleeds damage the joints, leading to arthropathy and severe chronic pain (Acharya, 2012). Bleeds and arthropathy can be prevented or minimised by early prophylactic (preventative) clotting factor treatment (Rodriguez-Merchan, 2012). A survey of over 5,000 adults with haemophilia in Europe showed that 67% had arthropathy and 35% had chronic pain (Holstein et al., 2012), and one in the USA showed that 39% of people with haemophilia believed their pain was not well treated (Witkop et al., 2012).

In haemophilia, there has been considerable use of PROMs such as the SF-36, which is a very widely used measure of health-related quality of life that meets most of the minimum standards criteria for PROM measures (Reeve et al., 2013). Studies have shown that people with haemophilia have poorer physical health-related quality of life than the general population (Fischer et al., 2003; Szende et al., 2003) and that physical health-related quality of life is poorer among people with haemophilia who have more joint damage or are not receiving prophylactic clotting factor treatment (Fischer et al., 2005; Royal et al., 2002; Solovieva, 2001). However, mental quality of life is less affected by haemophilia and is less closely associated with joint status (Poon et al., 2012; Zhou et al., 2011).

Research with PROMs has influenced overall standards of care for haemophilia, for example by demonstrating the value of prophylactic clotting factor treatment. This in turn led to more efforts to involve patients in self-management, for example by self-administering clotting factor (Stover, 2000). More recently there have been efforts to use PROMS more directly to inform individual treatment and management. In one example, a doctor used a health-related quality of life PROM to help decide about treatment with prophylaxis (preventative treatment to avoid bleeding episodes): *“You discuss the impact of hemophilia on his health-related quality of life (HRQOL) and consider measuring his HRQOL over time using a generic measure of HRQOL to determine whether prophylaxis will reduce interruptions, pain, and lost time from work and improve his HRQOL.”* (Buchbinder and Ragni, 2013, p. 52).

The main emphasis in the use of patient-reported quality of life measures so far has therefore been the prevention of joint bleeds and chronic joint pain, rather than the self-management of chronic pain, but there is now more emphasis on chronic pain management and self-management. Some analyses called for a more standardised approach to assessing

and managing pain in haemophilia, based on good practice guidelines and recommendations (Riley et al., 2011). Others recommended more individualised, multi-modal approaches, which would enable individual patient-reported information to inform treatment decisions and clinical management: *“Ongoing psychosocial assessment is critical to identify those factors that may be contributing to the perpetuation of chronic pain or acting as barriers to effective management”* (Young et al., 2013, p. 113).

However, that approach will probably require PROMs other than generic measures of health-related quality of life. One review of PROMs more generally concluded that generic measures like the SF-36 may not be clinically relevant enough to prompt clinicians to make changes to patient management (Greenhalgh and Meadows, 1999), and the same conclusion has been reached in the context of haemophilia. One review concluded that generic measures such as the SF-36 were not specific or responsive enough to changes in health status, and that a haemophilia-specific tool was needed to focus on specific features of haemophilia while also taking account of common comorbidities such as hepatitis and HIV, as well as arthropathy (Szende et al., 2003). Because arthropathy is so common in haemophilia, this might involve incorporating parts of arthritis-specific scales, although it would be important to recognise that arthropathy in haemophilia is different from primary arthritis; for example, it rarely affects the fingers and hands (Szende et al., 2003). Condition-specific quality of life measures have been developed for haemophilia (Remor et al., 2004), but they are not widely used so far.

Using PROMs more effectively in routine clinical practice

For both rheumatic conditions and haemophilia, integrating PROMs in clinical practice has the potential to enhance patient-centred care and improve patients’ self-management. However, a key issue limiting successful implementation may be clinicians’ lack of knowledge on how to effectively utilize PROMs data in their clinical encounters (Santana et al., 2015). An analysis of consultations between oncologists and their patients suggested that the main obstacles for enhancing the use of PROMs for making changes in clinical care may be limitations in the collection and interpretation of PROM data. The study concluded that *“explicit mention of PROM data in the consultation may strengthen opportunities for patients to elaborate on their problems, but that doctors may not always know how to do this”* (Greenhalgh et al., 2013). A model for PROMs in clinical practice was proposed that combined standard questionnaires with disease-specific or treatment-specific items, plus a prompt list of items, in order to facilitate discussion of individual-specific issues and minimize patient burden (Velikova et al., 2008). One review of sixteen qualitative studies on the experiences of professionals using PROMs concluded that the key ways to facilitate greater use of PROMs were to make the collection of PROM data part of normal work routines, and to give the PROMs data meaning by using them to make changes to patient care (Boycel et al., 2014).

A model for implementing changes in clinical practice proposed combining several approaches, including experiential learning; producing evidence-based guidelines; adapting

training for specific audiences; reviewing performance and giving feedback and reminders; supporting care providers and key opinion formers; and promoting organisational innovation (Grol, 1997). More recently, Santana et al. (2015) described the development and implementation of three programs for training clinicians to use PROM data effectively in routine practice, which aimed to identify the key components for successful clinician training. The programs were in diverse clinical areas (adult oncology, lung transplant and paediatrics), and in three countries with different healthcare systems, providing a rare opportunity to extract common approaches whilst recognizing specific settings. The programs showed that clinicians with different professional backgrounds can be successfully trained to use PROMs effectively in clinical practice using brief training programs to help them interpret and act on PROM data (Santana et al., 2015).

Self-management programmes and PROMs

Self-management is important in chronic illness because those affected must learn to live with and manage their condition. Self-management programmes *“usually consist of organized learning experiences designed to facilitate adoption of health-promoting behaviors”* (Warsi et al., 2004, p. 1641). This can include the optimal use of drugs, exercise, nutrition and other preventative and health behaviours, as well as communicating effectively with health professionals, family and/or caregivers, and learning techniques to address both the physical and emotional challenges caused by chronic illness (Newman et al., 2004).

Evidence about the effectiveness of self-management interventions differs between conditions. There is evidence they are beneficial for people with asthma, diabetes or hypertension but have smaller effects for people with arthritis (Chodosh et al., 2005; Warsi et al., 2003; 2004). More recently, one review also concluded that people with rheumatoid arthritis receive only marginal benefits from participation in chronic disease self-management interventions, and that although the intervention programme appeared to have worked in some cases, the data actually showed only small effects, which perhaps raises questions about the measures used in the evaluation of such programs (Nolte et al., 2013).

A wide variety of intervention programs have been developed to enable patients to become more independent in managing their disease and take appropriate decisions for a more active and fulfilling life (Nolte and Osborne, 2013) and PROM data can be useful at several stages of interventions. Firstly, before the intervention begins, PROMs can be used to assess patients' resources and skills, so that the interventions can be made more effective and more focused by taking account of individual patient profiles. The World Health Organization recommends developing psycho-educational diagnoses to define personalized self-management programs (WHO, 1998). PROMs can help to understand the different aspects of a patient's life, personality, goals and needs, by making subjective assessments of the impact of life events and representations of the disease, as well as self-efficacy, coping strategies, motivation and other factors, including respondents' perceptions of what it would take for them to change their behaviour (Michie et al., 2014).

Secondly, PROMs can be used to monitor patients' progress during self-management interventions, and the results can inform possible adjustment or reframing of the intervention. For several years, researchers and clinicians worked to develop a Taxonomy of behaviour change techniques that could be applied to many different types of behaviour change interventions across different disciplines and countries, including organizational and community interventions (Michie et al., 2005; 2013).

Thirdly, at the end of the intervention, as the WHO recommends for therapeutic patient education, PROMs can be used to evaluate the overall effectiveness of the programme, and assess changes in patients' skills and adaptation. Thus, at the different stages of self-management programs, there is value in enabling a standardized evaluation throughout the intervention.

PROMs can also be fully integrated into the intervention. The integration of PROMS and self-management for patients with inflammatory arthritis in a joint-fitness program succeeded in improving self-perceived health as well as disease activity (El Miedany et al., 2012). Integrating PROMs with patient education is also feasible in standard clinical practice, and empowering patients through education may allow them to be more proactive in seeking better evidence based medical treatments at an earlier stage (Vermaak et al., 2015).

PROMs and chronic pain self-management

For assessment and evaluation of pain it may be useful to adopt or adapt patient-reported measures that have been employed in other chronic pain conditions (Humphries and Kessler, 2013). For chronic pain self-management, and to improve PROMs, it is also important to know about how people think and feel about their pain, and those aspects can be assessed using standardised self-report measures of knowledge, attitudes, beliefs and behaviours., including pain coping, pain acceptance, and readiness to self-manage pain. For two decades, Cognitive-Behavioural Therapy (CBT), more especially Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) and physical activity promotion have emerged as major tools in the treatment of patients with chronic pain. Harlacher et al. (2011) examined whether Multidimensional Pain Inventory (MPI) subscale score changes could be used for monitoring pain rehabilitation programmes, using the Psychological General Well-Being (PGWB) index as a separate measure of rehabilitation outcome. They proposed combining the scores from four MPI subscales, and using pre-to-post differences in PGWB scores to indicate composite rehabilitation outcomes. One study also showed that patients' beliefs about the nature and treatment of their pain could change during participation in a multidisciplinary pain management programme, and that modification of those beliefs may be associated with improvements in patients' perceptions of the level of their disability (Walsh and Radcliffe, 2002).

For managing chronic pain, it is necessary to evaluate the patient's beliefs. Most often, PROMs are used to identify cognitive errors in patients' thinking and to understand the relation between thoughts, emotions and pain. Otis (2003) proposed using the ABC

Worksheet to identify patients' beliefs and perceived consequences associated with pain. In the ABC Workshop, A is for Activating Event (the stressful situation associated with pain). B is for beliefs (the things you tell yourself, and the thoughts you have about the pain situation). C is for Consequences (reactions to pain, which can be emotional, physical or behavioural, or all three). Patients may begin to see that negative thoughts make the experience of pain worse, and then learn to replace negative thoughts with more positive thoughts. This will help reduce negative emotions and can result in decreased pain. The assessment of cognitive distortions can be realized using Beck et al.'s (1991) Dysfunctional Attitudes Scale (DAS).

To manage chronic pain, it is also necessary to evaluate and regulate the emotional processes associated with pain. Emotional intelligence (EI), which refers to individual differences in the abilities to identify, assess, understand, express, regulate and use emotional information, and can be applied separately to the emotions of oneself and others, has been found to be an important predictor of pain management and adaptation to environment (Mikolajczak et al., 2014). The Profile of Emotional Competence (PEC) measures the skills required to identify, give meaning to and manage the emotions associated with pain (Brasseur et al., 2013). Through analysis of PROMs like the PEC, the multidisciplinary team can offer a targeted intervention to develop or strengthen the emotional competences of the chronic pain patient. Following this assessment of emotional skills, different types of interventions can be offered with the purpose of regulating the emotions associated with pain. For example, an integrative intervention (Positive Emotion Regulation program) was designed to help clinicians implement interventions and techniques that target different emotional processes Weytens et al. (2014). The emotional processes involved are structured around a theoretical framework (Gross, 1998; Quoidbach et al., Gross, 2013). Other forms of intervention can be proposed which are based on the Emotion-Focused Therapy (EFT) (Greenberg, 2002; Greenberg and Pascual-Leone, 2006).

In haemophilia it is vitally important to differentiate chronic joint pain from acute bleeding pain, for acute bleeding pain should be treated promptly with clotting factor. However, people with haemophilia may sometimes not make this distinction. In one study, people with haemophilia used similar descriptors for acute and chronic pain, and many reported using clotting factor to treat chronic pain, or failed to use factor treatment to treat acute pain (Witkop et al., 2011).

The key elements of chronic joint pain self-management for people with haemophilia are sometimes summarized as Rest, Ice, Compression and Elevation (RICE). (Compression means applying pressure to the painful area, and elevation means raising the affected limb.) Those four things were in fact the most frequently used pain management strategies among a US sample of people with haemophilia (Witkop et al., 2012). Among people with haemophilia in the Netherlands, 36% of those with joint pain used analgesics (painkillers) (van Genderen et al., 2006). In Germany, 76% of people with severe haemophilia took analgesics daily (Wallny et al., 2001). In the UK, 53% of people with haemophilia used over-the-counter analgesics and 34% used prescription analgesics in the last month (Elander and Barry, 2003). Knowledge about analgesics is important because certain pain medications can cause

complications for people with haemophilia (Holstein et al., 2012), but there is surprisingly little research evidence about patients' or practitioners' knowledge and beliefs about pain relief for people with haemophilia, or about how they can be improved to increase the quality of haemophilia-related joint pain management.

In other painful chronic conditions, self-management interventions in the form of small-group education sessions, often drawing on principles from cognitive-behavioural therapy, have been developed and evaluated (Moore et al., 2000; Von Korff et al., 1998; Barlow et al., 2000). Considerable attention has also focused on increasing motivation or 'readiness' to self-manage pain, for self-management programs are limited by participants' readiness to self-manage. Readiness to self-manage chronic pain can be measured using a standardised patient-report questionnaire (Kerns et al., 1997). In the motivational model of pain self-management, a number of factors influence readiness to self-manage, and readiness to self-manage then influences self-management behaviours (Jensen et al., 2003).

One intervention to improve readiness to self-manage chronic joint pain among people with haemophilia comprised an information booklet and DVD (Elander et al., 2011). The booklet described the difference between acute bleeding pain and chronic arthritic joint pain, the impact of pain on emotions and other aspects of life, the benefits and risks of using pain medication, and the benefits of active self-management and exercise. The DVD was based very directly on patient-reported information; all the content was presented by five men with haemophilia who described their own experiences of living with joint pain, including its impact on their lives and how they had adjusted their life goals and values accordingly. The information was consistent with the motivational model of pain self-management, but the emphasis on direct patient reports was intended to increase viewers' motivation to self-manage their chronic joint pain (Elander et al., 2011).

The booklet and DVD were evaluated in a 6-month trial in which all the participants received the booklet and a randomly selected half also received the DVD. Compared with those who received only the booklet, patient-reported readiness to self-manage improved among those who received the DVD. Active pain coping also increased among participants generally, and active involvement in learning pain self-management strategies and incorporating those strategies in everyday life increased among those who reported reading or watching the materials (Elander et al., 2011). Evidence like this suggests that self-management can be improved by giving patients a role in communicating information about their experiences, and by incorporating patient-reported outcomes directly into the materials used in interventions.

Pain coping and acceptance as influences on patient-reported outcomes

Pain coping usually means the characteristic ways that people approach and respond to pain in order to control or avoid it, and is typically assessed using standardised patient-report questionnaires (Jensen et al., 1991). For people with haemophilia, a condition-specific patient-report measure of pain coping has been developed and evaluated (Barry and Elander,

2002; Elander and Robinson, 2008). The ways that people with haemophilia coped with pain was similar to people with other painful chronic conditions (Barry and Elander, 2002; Santavirta et al., 2001), and active pain coping (using active behavioural or cognitive strategies) was associated with greater readiness to self-manage pain, whereas negative thoughts about pain and passive pain coping were associated with less readiness to self-manage pain (Elander and Robinson, 2008). Negative thoughts about pain were associated with beliefs that chance factors were responsible for pain control and with concerns about drug use, whereas passive pain coping was associated with beliefs about doctors being responsible for pain control, more frequent visits to healthcare professionals, and greater use of analgesic medication (Barry and Elander, 2002; Elander and Barry, 2003).

However, in much chronic pain research the emphasis has turned in recent years from pain coping to pain acceptance, because attempts to control or avoid pain can lead to negative outcomes when they are unsuccessful, as they may often be when pain is chronic. Pain acceptance means recognizing that pain cannot always be avoided or controlled and that pain should not prevent efforts to engage with other valued goals and activities (McCracken and Eccleston, 2003). Among people with more common chronic pain conditions, research often shows that acceptance rather than coping is a better predictor of outcomes, including patient-reported outcomes (McCracken and Eccleston, 2006).

We know of only two studies of patient-reported outcomes among people with haemophilia that included measures of both pain coping and pain acceptance, and both of these showed that pain intensity affected physical quality of life and pain acceptance influenced mental quality of life, whereas active coping did not influence either physical or mental quality of life (Elander et al., 2009; Elander et al., 2013). This seems to suggest that improvements in patient-reported outcomes for people with haemophilia could be achieved by interventions that reduced pain intensity and increased pain acceptance.

Interventions to improve patient-reported outcomes for people with haemophilia-related joint pain could focus on reducing pain intensity and increasing pain acceptance, and both of those factors could be targeted by clinical practice and treatments that were informed by patient-reported outcomes. To reduce pain intensity, pain assessment could be improved by adapting patient-reported methods that are used in other chronic pain conditions (Humphries and Kessler, 2013), and by educating patients to differentiate acute bleeding pain from chronic arthritic pain, so that acute bleeding episodes can be promptly treated with clotting factor. Patients could also be informed and educated about analgesics and other pain management methods, including published guidance about pain management for people with haemophilia (Holstein et al., 2012).

To improve pain acceptance, existing programmes designed for people with other chronic pain conditions could be refined and adapted for people with haemophilia. These typically involve small group exercises including exposure, habit reversal training, mindfulness meditation and sensation focusing (McCracken et al., 2005), but pain acceptance must be interpreted differently in each context and medical condition (Risdon et al., 2003), so patient-reported outcomes could very usefully inform the development and adaptation of

acceptance-based interventions for people with haemophilia. One technique that could be used to achieve this is the clinical pain acceptance Q-sort, which can be used to explore pain acceptance in clinical contexts, and can be used as a therapeutic tool to discuss and promote pain acceptance in a sensitive, diplomatic way that takes into account patient-reported experiences and outcomes (La Cour, 2012).

A recent review suggested there could be a conflict between the short-term goal of providing effective pain relief to reduce pain intensity and the longer-term goal of improving pain acceptance (Elander, 2014). The review recommended that interventions should be “very carefully designed to take into account the specific needs of the people for whom they are intended, and should take specific care not to reduce the importance that should be attached to prompt treatment of acute bleeding episodes with clotting factor” (Elander, 2014, p. 171).

Conclusions

Most of the research and reflective practice about PROMs generally is applicable to chronic pain conditions like rheumatic disorders and haemophilia, so research and practice in those conditions might be expected to follow the more general direction of travel for improving PROM use. One challenge is to improve the PROMs themselves. Patients are increasingly committed to participating in the development and improvement of PROMs, and an international exploration of patient engagement in HRQL and PROM research highlighted that, in the absence of good practice guidelines, a framework or toolkit to help embed patient engagement within health-related quality of life and PROM research is required (Haywood, 2015). One issue is to ensure that PROMs are suitable for the wide range of people potentially affected by their use, including those with low literacy and members of minority cultural and ethnic groups (Petkovic et al., 2015). Another is to produce short forms of PROMS that preserve their psychometric properties but reduce the time needed to complete them (Guillemin, 2016; Goetz et al., 2013). The International Society for Quality of Life Research (ISOQOL) may have a key role in taking those ideas forward, by actively engaging with patient partners to shape a future ISOQOL patient engagement strategy (Haywood, 2015; Reeve et al., 2013).

A second challenge is to improve the ways PROMs are incorporated in the design and development of clinical interventions, in order to improve the quality and effectiveness of those interventions. To achieve this, health professionals may need to be better educated about PROM use. Increasing interest among clinicians in using PROMs in their clinical practice has led to the development of international registers and consortia that help to reach consensus among researchers and practitioners (Breckenridge et al., 2015). A reflection paper on the use of PROMs in oncology provides a useful update on design issues common to all trial research with PROM endpoints, and could serve as a model for using PROMs in other conditions (European Medicines Agency, 2014). Other areas that need to be investigated include the use of the Consolidated Standards of Reporting Trials (CONSORT) PROM extension

to drive up standards of reporting, the value of 'negative' PROM findings, the need for better information about historical labelling decisions, and the role of patients in the PROM trial design and implementation (Kyte et al., 2016). All those issues could be usefully applied to arthritis and haemophilia.

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References

- Acharya, SS. (2012). Exploration of the pathogenesis of haemophilic joint arthropathy: understanding implications for optimal clinical management. *British Journal of Haematology*, 156, 13-23. DOI: 10.1111/j.1365-2141.2011.08919.x
- Ahles, T.A., Wasson, J.H., Seville, J.L., Johnson, D.J., Cole, B.F., Hanscom, B., Stukel, T.A. and McKinstry, E. (2006). A controlled trial of methods for managing pain in primary care patients with or without co-occurring psychosocial problems. *The Annals of Family Medicine*, 4, 341-350. DOI: 10.1370/afm.527.
- Barlow, J.H., Turner, A.P. and Wright, C.C. (2000). A randomized controlled study of the Arthritis Self-Management Programme in the UK. *Health Education Research*, 15, 665-680. DOI: 10.1093/her/15.6.665
- Barry, T. and Elander, J. (2002). Pain coping strategies among patients with haemophilia. *Psychology, Health and Medicine*, 7, 271-281. DOI: 10.1080/13548500220139430
- Beck, A.T., Brown, G., Steer, R.A. and Weissman, A.N. (1991). Factor analysis of the Dysfunctional Attitude Scale in a clinical population. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 3, 478-483.
- Berthelot, J.M., De Bandt, M., Morel, J., Benatig, F., Constantin, A., Gaudin, P., Le Loet, X., Maillefert, J.F., Meyer, O., Pham, T., Saraux, A., Solau-Gervais, E., Spitz, E., Wendling, D., Fautrel, B., Guillemin, F. and the STPR group of French Society of Rheumatology. (2012). A tool to identify recent or present rheumatoid arthritis flare from both patient and physician perspectives: the 'FLARE' instrument. *Ann Rheum Dis*. Jul; 71(7):1110-6. DOI: 10.1136/ard.2011.150656.
- Bingham, C.O., Pohl, C., Woodworth, T.G., Hewlett, S.E., May, J.E., Rahman, M.U., Witter, J.P., Furst, D.E., Strand, C.V., Boers, M. and Alten, R.E. (2009). Developing a standardized definition for disease "flare" in rheumatoid arthritis (OMERACT 9 Special Interest Group). *The Journal of Rheumatology*, 36, 2335-2341.
- Boycel, M.B., Browne J.P. and Greenhalgh J. (2014). The experiences of professionals with using information from patient-reported outcome measures to improve the quality of healthcare: a systematic review of qualitative research *BMJ Quality and Safety*, 23, 508-518. DOI: 10.1136/bmjqs-2013-002524
- Brasseur S., Grégoire J., Bourdu R., and Mikolajczak M. (2013). The Profile of Emotional Competence (PEC): Development and validation of a self-reported measure that fits

- dimensions of emotional competence theory. *PLOS One*, 8 (5), e62635. DOI: 10.1371/journal.pone.0062635.
- Breckenridge, K., Bekker, H.L., Gibbons, E., van der Veer, S.N., Abbott, D., Briancon, S., et al. (2015). How to routinely collect data on patient-reported outcome and experience measures in renal registries in Europe: An expert consensus meeting. *Nephrol. Dial. Transplant.*, 30(10), 1605–1614.
- Brooks P.M. (2006). The burden of musculoskeletal disease – a global perspective. *Clinical Rheumatology*, 25, 778-781.
- Buchbinder, D. and Ragni, M.V. (2013). What is the role of prophylaxis in the improvement of health-related quality of life of patients with haemophilia? *American Society of Hematology Education Program Book*, 2013(1), 52-55. DOI: 10.1182/asheducation-2013.1.52
- Chodosh, J., Morton, S. C., Mojica, W., Maglione, M., Suttorp, M. J., Hilton, L., Rhodes, S. and Shekelle, P. (2005). Meta-analysis: chronic disease self-management programs for older adults. *Annals of Internal Medicine*, 143, 427–438. DOI: 10.7326/0003-4819-143-6-200509200-00007
- Dür, M., Coenen, M., Stoffer, M.A., Fialka-Moser, V., Kautzky-Willer, A., Kjeklen I., Drăgoi, R.G., Mattsson, M., Boström C., Smolen J. and Stamm, T.A. (2015). Do patient-reported outcome measures cover personal factors important to people with rheumatoid arthritis? A mixed methods design using the International Classification of Functioning, Disability and Health as frame of reference. *Health and Quality of Life Outcomes*, 13: 27.
- El Miedany, Y., El Gaafary, M., El Arousy, N., Ahmed, I., Youssef, S., Palmer, D. (2012). Arthritis education: the integration of patient-reported outcome measures and patient self-management. *Clinical and Experimental Rheumatology*; 30, 899–904.
- Elander, J. (2014). A review of evidence about behavioural and psychological aspects of chronic joint pain among people with haemophilia. *Haemophilia*, 20, 168-175. DOI: 10.1111/hae.12291
- Elander, J. and Barry, T. (2003). Analgesic use and pain coping among patients with haemophilia. *Haemophilia*, 9, 202-213. DOI: 10.1046/j.1365-2516.2003.00723.x
- Elander, J. and Robinson, G. (2008). A brief haemophilia pain coping questionnaire (HPCQ). *Haemophilia*, 14, 1039-1048. DOI: 10.1111/j.1365-2516.2008.01822.x
- Elander, J., Robinson, G., Mitchell, K. and Morris, J. (2009). An assessment of the relative influence of pain coping, negative thoughts about pain, and pain acceptance on health-related quality of life among people with hemophilia. *Pain*, 145, 169-175. DOI: 10.1016/j.pain.2009.06.004
- Elander, J., Robinson, G. and Morris, J. (2011). Randomized trial of a DVD intervention to improve readiness to self-manage joint pain. *Pain*, 152, 2333-2341. DOI: 10.1016/j.pain.2011.06.026.
- Elander, J., Morris, J. and Robinson, G. (2013). Pain coping and acceptance as longitudinal predictors of health-related quality of life among people with hemophilia-related

- chronic joint pain. *European Journal of Pain*, 17, 929-938. DOI: 10.1002/j.1532-2149.2012.00258.x
- European Medicines Agency (2014). Reflection Paper on the use of patient reported outcome (PRO) measures in oncology studies. European Medicines Agency, Oncology Working Party; Doc. Ref. EMA/ CHMP/292464/2014.
- Fischer, K., Van der Bom, J.G. and Van den Berg, H.M. (2003). Health-related quality of life as outcome parameter in haemophilia treatment. *Haemophilia*, 9 (Suppl. 1), 75-81. DOI: 10.1046/j.1365-2516.9.s1.13.x
- Fischer, K., Van der Bom, J.G., Mauser-Bunschoten, E.P., Roosendaal, G. and Van den Berg, H.M. (2005). Effects of haemophilic arthropathy on health-related quality of life and socio-economic parameters. *Haemophilia*, 11, 43-48. DOI: 10.1111/j.1365-2516.2005.01065.x
- Fung, C. H. and Hays, R. D. (2008). Prospects and challenges in using patient-reported outcomes in clinical practice. *Quality of Life Research*, 17, 1297-1302.
- Goetz, C., Coste, J., Lemetayer, F., Rat, A.C., Montel, S., Recchia, S., Debouverie, M., Pouchot, J., Spitz, E. and Guillemin, F. (2013). Item reduction based on rigorous methodological guidelines is necessary to maintain validity when shortening composite measurement scales. *Journal of Clinical Epidemiology*, 66, 710-718. DOI: 10.1016/j.jclinepi.2012.12.015.
- Golightly, Y.M, Allen, K.D., Nyrop, K.A., Nelson, A.E., Callahan, L.F., and Jordan, J.M. (2015). Patient-reported outcomes to initiate a provider-patient dialog for the management of hip and knee osteoarthritis. *Semin. Arthritis. Rheum.*, 45 (2), 123–131.
- Greenberg L.S. (2002). *Emotion-focused therapy. Coaching clients to work through their feelings*. Washington, D.C.: American Psychological Association.
- Greenberg, L.S. and Pascual-Leone, A. (2006). Emotion in psychotherapy: a practice-friendly research review. *Journal Clinical Psychology*, 62, 611-30.
- Greenhalgh, J. (2009). The applications of PROs in clinical practice: what are they, do they work, and why? *Quality of Life Research*, 18, 115-123. DOI: 10.1007/s11136-008-9430-6
- Greenhalgh, J. and Meadows, K. (1999). The effectiveness of the use of patient-based measures of health in routine practice in improving the process and outcomes of patient care: a literature review. *Journal of Evaluation in Clinical Practice*, 5, 401-416.
- Greenhalgh, J., Long, A. F. and Flynn, R. (2005). The use of patient reported outcome measures in routine clinical practice: lack of impact or lack of theory? *Social Science and Medicine*, 60, 833-843. DOI: 10.1016/j.socscimed.2004.06.022
- Greenhalgh, J., Abhyankar, P., McCluskey, S., Takeuchi, E. and Velikova, G. (2013). How do doctors refer to patient-reported outcome measures (PROMS) in oncology consultations? *Quality of Life Research*, 22, 939-950.
- Grol, R. (1997). Personal paper. Beliefs and evidence in changing clinical practice. *BMJ*, 315, 418–421.

- Gross J.J. (1998). The emerging field of emotion regulation: A integrative review. *Review of General Psychology*, 2 (3), 271-299.
- Gross, J.J. (2013). Emotion regulation: Taking stock and moving forward. *Emotion*, 13 (3), 359–365. DOI:10.1037/a0032135
- Guillemin F, Coste J, Pouchot J, Ghezail M, Bregeon C, Sany J. (1997). The AIMS2-SF: a short form of the Arthritis Impact Measurement Scales 2. French Quality of Life in Rheumatology Group. *Arthritis Rheum.*, 40, 1267–74.
- Guillemin, F., Rat, A. C., Goetz, C., Spitz, E., Pouchot, J., & Coste, J. (2016). The Mini-OAKHQOL for knee and hip osteoarthritis quality of life was obtained following recent shortening guidelines. *Journal of Clinical Epidemiology*, 69, 70-78.
- Harlacher U, Persson AL, Rivano-Fischer M, Sjölund BH. (2011). Using data from Multidimensional Pain Inventory subscales to assess functioning in pain rehabilitation. *Int. J. Rehabil. Res.*, 34 (1), 14-21. DOI: 10.1097/MRR.0b013e3283440bda.
- Haywood, K., Brett, J., Salek, S., Marlett, N., Penman, C., Shklarov, S., Norris, C., Santana, M.J. and Staniszewska, S. (2015). Patient and public engagement in health-related quality of life and patient-reported outcomes research: what is important and why should we care? Findings from the first ISOQOL patient engagement symposium. *Quality of Life Research*, 24 (5), 1069-1076. DOI 10.1007/s11136-014-0796-3
- Hawker G, Melfi C, Paul J, Green R, Bombardier C. (1995). Comparison of a generic (SF-36) and a disease specific (WOMAC) (Western Ontario and McMaster Universities Osteoarthritis Index) instrument in the measurement of outcomes after knee replacement surgery. *J Rheumatol.*, 22, 1193–1196.
- Hayes, S. C., Strosahl, K. & Wilson, K. G. (1999). *Acceptance and commitment therapy*. New York: Guilford Press.
- Holstein, K., Klamroth, R., Richards, M., Carvalho, M., Perez-Garrido, R. and Gringeri, A. (2012). Pain management in patients with haemophilia: a European survey. *Haemophilia*, 18, 743-752. DOI: 10.1111/j.1365-2516.2012.02808.x
- Humphries, T. J. and Kessler, C. M. (2013). The challenge of pain evaluation in haemophilia: can pain evaluation and quantification be improved by using pain instruments from other clinical situations? *Haemophilia* 19, 181-187. DOI: 10.1111/hae.12023
- Jensen, M.P., Turner, J.A., Romano, J.M. and Karoly, P. (1991). Coping with chronic pain - a critical review of the literature. *Pain*, 47, 249-283. DOI: 10.1016/0304-3959(91)90216-K
- Jensen, M.P., Nielson, W.R. and Kerns, R.D. (2003). Towards the development of a motivational model of pain self-management. *Journal of Pain*, 4, 477-492. DOI: 10.1067/S1526-5900(03)00779-X
- Kerns, R.D., Rosenberg, R., Jamison, R.N., Caudill, M.A. and Haythornwaite, J. (1997). Readiness to adopt a self-management approach to chronic pain: the Pain Stages of Change Questionnaire (PSOCQ). *Pain*, 72, 227-234.
- Kliegman, R. (2011). *Nelson Textbook of Pediatrics* (19th Ed.). Philadelphia: Saunders.

- Kyte, D., Reeve, B.B., Efficace, F., Haywood, K., Mercieca-Bebber, R., King, M.T., Norquist, J.M., Lenderking, W.R., Snyder, C., Ring, L. and Velikova, G. (2016). International Society for Quality of Life Research commentary on the draft European Medicines Agency reflection paper on the use of patient-reported outcome (PRO) measures in oncology studies. *Quality of Life Research*, 25, 359-362. DOI 10.1007/s11136-015-1099-z
- La Cour, P. (2012). The clinical pain acceptance Q-sort: A tool for assessment and facilitation of pain acceptance. *Psychology Health and Medicine*, 17, 611-620. DOI: 10.1080/13548506.2011.648646
- Marshall, S., Haywood, K. and Fitzpatrick, R. (2006). Impact of patient-reported outcome measures on routine practice: a structured review. *Journal of Evaluation in Clinical Practice*, 12, 559-568.
- Matcham, F., Ali, S., Hotopf, M. and Chalder T. (2015). Psychological correlates of fatigue in rheumatoid arthritis: A systematic review. *Clinical Psychology Review*, 39, 16-29.
- McCracken, L.M. and Eccleston, C. (2003). Coping or acceptance: what to do about chronic pain? *Pain*, 105, 197-204. DOI: 10.1016/S0304-3959(03)00202-1
- McCracken, L.M. and Eccleston, C. (2006). A comparison of the relative utility of coping and acceptance-based measures in a sample of chronic pain sufferers. *European Journal of Pain*, 10, 23-29. DOI: 10.1016/j.ejpain.2005.01.004
- McCracken, L.M., Vowles, K.E. and Eccleston, C. (2005). Acceptance-based treatment for persons with long-standing chronic pain: a preliminary analysis of treatment outcome in comparison to a waiting phase. *Behavior Research and Therapy*, 43, 1335-1346. DOI: 10.1016/j.brat.2004.10.003
- Michie, S., Johnston M., Abraham C., Lawton R., Parker D. and Walker A. (2005). Making psychological theory useful for implementing evidence based practice: a consensus approach. *Quality and Safety in Health Care Journal*, 14 (1), 26–33.
- Michie S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., Eccles, M.P., Cane, J. and Wood C.E. (2013). The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions. *Ann. Behav. Med.*, 46, 81–95. DOI: 10.1007/s12160-013-9486-6
- Michie S., Atkins, L. and West R. (2014). *The behavior Change Wheel. A guide to designing interventions*. Silverbackpublishing. <http://silverbackpublishing.org>
- Mikolajczak, M., Brasseur, S. and Fantini-Hauwel, C. (2014). Measuring intrapersonal and interpersonal EQ: The Short Profile of Emotional Competence (S-PEC). *Personality and Individual Differences*. 65, 42-46.
- Moore, J.E., Von Korff, M., Cherkin, D., Saunders, K. and Lorig, K. (2000). A randomized trial of a cognitive-behavioral program for enhancing back pain self-care in a primary care setting. *Pain*, 88, 145-153. DOI: 10.1016/S0304-3959(00)00314-6
- Newman, S., Steed, L. and Mulligan K. (2004). Self-management interventions for chronic illness. *The Lancet*, 364, 1523-37.

- Nolte, S. and Osborne, R. H. (2013). A systematic review of outcomes of chronic disease self-management interventions. *Quality of Life Research*, 22, 1805-1816.
- Nolte, S., Elsworth, G.R., Newman S. and Osborne, R. H. (2013). Measurement issues in the evaluation of chronic disease self-management programs. *Quality of Life Research*, 22, 1655-1664.
- Quoidbach, J., Mikolajczak, M. and Gross, J. J. (2015). Positive interventions: An emotion regulation perspective. *Psychological Bulletin*, 141, 655-693.
- Otis J.D. (2007). *Managing chronic pain. A Cognitive-Behavioral Therapy Approach*. Oxford University press. New York.
- Petkovic, J., Epstein, J., Buchbinder, R., Welch, V., Rader, T., Lyddiatt, A., et al. (2015). Toward ensuring health equity: Readability and cultural equivalence of OMERACT patient reported outcome measures. *The Journal of Rheumatology*, jrheum.141168. <http://doi.org/10.3899/jrheum.141168>
- Poon, J.L., Zhou, Z. -Y., Doctor, J.N., Wu, J., Ullman, M.M., Ross, C., Riske, B., Parish, K. L., Lou, M., Koerper, M.A., Gwadry-Sridhar, F, Forsberg, A.D., Curtis, R.G. and Johnson, K.A. (2012). Quality of life in haemophilia A: Hemophilia Utilization Group Study Va (HUGS-Va). *Haemophilia*, 18, 699-707. DOI: 10.1111/J.1365-2516.2012.02791.X
- Rat, A.C., Coste, J., Pouchot, J., Baumann, M., Spitz, E., Retel-Rude, N., et al. (2005). OAKHQOL: A new instrument to measure quality of life in knee and hip osteoarthritis. *J. Clin. Epidemiol.*, 58 (1), 47–55.
- Reeve, B. B., Wyrwich, K. W., Wu, A. W., Velikova, G., Terwee, C. B., Snyder, C. F., ... & Butt, Z. (2013). ISOQOL recommends minimum standards for patient-reported outcome measures used in patient-centered outcomes and comparative effectiveness research. *Quality of Life Research*, 22, 1889-1905. DOI 10.1007/s11136-012-0344-y
- Remor, E., Young, N.L., Von Mackensen, S. and Lopatinas, E.G. (2004). Disease-specific quality of life measurement tools for haemophilia patients. *Haemophilia*, 10 (Suppl. 4), 30-34.
- Ren XS, Kazis L, Meenan RF. Short-form Arthritis Impact Measurement Scales 2: tests of reliability and validity among patients with osteoarthritis (1999). *Arthritis Care Res.*, 12, 163–71.
- Riley, R. R., Witkop, M., Hellman, E., and Akins, S. (2011). Assessment and management of pain in haemophilia patients. *Haemophilia*, 17, 839-845. DOI: 10.1111/j.1365-2516.2011.02567.x
- Risdon, A., Eccleston, C., Crombez, G. and Mccracken, L. (2003). How can we learn to live with pain? A Q-methodology analysis of the diverse understandings of acceptance of chronic pain. *Social Science and Medicine*, 56, 375-386.
- Rodriguez-Merchan, E C. (2012). Prevention of the musculoskeletal complications of hemophilia. *Advances in Preventive Medicine*, Epub 201271. DOI: 10.1155/2012/201271
- Royal, S., Schramm, W., Berntorp, E., Giangrande, P., Gringeri, A., Ludlam, C., Kroner, B. and Szucs, T. (2002). Quality of life differences between prophylactic and on-demand

- factor replacement therapy in European haemophilia patients. *Haemophilia*, 8, 44-50. DOI: 10.1046/j.1365-2516.2002.00581.x
- Sanderson, T., Morris, M., Calnan, M., Richards, P., and Hewlett, S. (2010). Patient perspective of measuring treatment efficacy: The rheumatoid arthritis patient priorities for pharmacologic interventions outcomes. *Arthritis Care Res.* (Hoboken), 62(5):647–656. DOI: 10.1002/acr.20151
- Santana, M. J., Haverman, L., Absolom, K., Takeuchi, E., Feeny, D., Grootenhuis, M., & Velikova, G. (2015). Training clinicians in how to use patient-reported outcome measures in routine clinical practice. *Quality of Life Research*, 12, 1707-1718. DOI: 10.1007/s11136-014-0903-5
- Santavirta, N., Bjorvell, H., Solovieva, S., Alaranta, H., Hurskainen, K. and Konttinen, Y.T. (2001). Coping strategies, pain, and disability in patients with hemophilia and related disorders. *Arthritis & Rheumatism-Arthritis Care & Research*, 45, 48-55. DOI: 10.1002/1529-0131(200102)45:1<48::AID-ANR83>3.0.CO;2-1
- Snyder, C. F., Aaronson, N. K., Choucair, A. K., Elliott, T. E., Greenhalgh, J., Halyard, M. Y, Hess, R., Miller, D.M., Reeve, B.B. and Santana, M. (2012). Implementing patient-reported outcomes assessment in clinical practice: a review of the options and considerations. *Quality of Life Research*, 21 (8), 1305-1314. DOI: 10.1007/s11136-011-0054-x
- Solovieva, S. (2001). Clinical severity of disease, functional disability and health-related quality of life. Three-year follow-up study of 150 Finnish patients with coagulation disorders. *Haemophilia*, 7, 53-63. DOI: 10.1046/j.1365-2516.2001.00476.x
- Stonebraker, J. S., Bolton-Maggs, P. H., Michael Soucie, J., Walker, I. and Brooker, M. (2010). A study of variations in the reported haemophilia A prevalence around the world. *Haemophilia*, 16, 20-32.
- Stover, B. (2000). Training the client in self-management of hemophilia. *Journal of Intravenous Nursing*, 23, 304-9.
- Szende, A., Schramm, W., Flood, E., Larson, P., Gorina, E., Rentz, A.M. and Snyder, L. (2003). Health-related quality of life assessment in adult haemophilia patients: a systematic review and evaluation of instruments. *Haemophilia*, 9, 678-687. DOI: 10.1046/j.1351-8216.2003.00823.x
- U.S. Department of Health and Human Services FDA Center for Drug Evaluation and Research, U.S. Department of Health and Human Services FDA Center for Biologics Evaluation and Research and U.S. Department of Health and Human Services FDA Center for Devices and Radiological Health (2006). Guidance for industry: patient-reported outcome measures: use in medical product development to support labeling claims: draft guidance. *Health and Quality of Life Outcomes*, 4, 79. DOI: 10.1186/1477-7525-4-79
- Valderas, J. M., Kotzeva, A., Espallargues, M., Guyatt, G., Ferrans, C. E., Halyard, M. Y., Revicki, D.A., Symonds, T., Parada, A. and Alonso, J. (2008). The impact of measuring patient-reported outcomes in clinical practice: a systematic review of the literature. *Quality of Life Research*, 17, 179-193. DOI: 10.1007/s11136-007-9295-0

- van Genderen, F.R., Fischer, K., Heijnen, L., de Kleijn, P., van den Berg, H.M., Helders, P.J.M., and van Meeteren, N.L.U. (2006). Pain and functional limitations in patients with severe haemophilia. *Haemophilia*, 12, 147-153. DOI: 10.1111/j.1365-2516.2006.01203.x
- Velikova, G., Awad, N., Coles-Gale, R., Wright, E.P., Brown, J.M. and Selby, P.J. (2008). The clinical value of quality of life assessment in oncology practice-a qualitative study of patient and physician views. *Psycho-oncology*, 17, 690-8.
- Vermaak V. , Briffa N.K., Langlands B., Inderjeeth C. and McQuade J. (2015) Evaluation of a disease specific rheumatoid arthritis self-management education program, a single group repeated measures study. *BMC Musculoskeletal Disorders*, 16, 214. DOI 10.1186/s12891-015-0663-6
- Von Korff, M., Moore, J.E., Lorig, K., Cherkin, D.C., Saunders, K., Gonzales, V.M., Laurent, D., Rutter, C., and Comite, F. (1998). A randomized controlled trial of a lay person-led self-management group intervention for back pain patients in primary care. *Spine*, 23, 2608-2615.
- Walsh, D.A. and Radcliffe J.C. (2002). Pain beliefs and perceived physical disability of patients with chronic low back pain. *Pain*, 97, 23-31.
- Warsi, A., LaValley, M. P., Wang, P. S., Avorn, J. and Solomon, D. H. (2003). Arthritis self-management education programs: A meta-analysis of the effect on pain and disability. *Arthritis and Rheumatism*, 48, 2207–2213.
- Warsi, A., Wang, P. S., LaValley, M. P., Avorn, J. and Solomon, D. H. (2004). Self-management education programs in chronic disease: A systematic review and methodological critique of the literature. *Archives of Internal Medicine*, 164, 1641–1649.
- Wallny, T., Hess, L., Seuser, A., Zander, D., Brackmann, H.H. and Kraft, C.N. (2001). Pain status of patients with severe haemophilic arthropathy. *Haemophilia*, 7, 453-458. DOI: 10.1046/j.1365-2516.2001.00540.x
- Wasson, J., Hays, R., Rubenstein, L., Nelson, E., Leaning, J., Johnson, D., et al. (1992). The short-term effect of patient health status assessment in a health maintenance organization. *Quality of Life Research*, 1, 99–106. DOI: 10.1007/BF00439717.
- Weytens F., Luminet O., Lesley L. Verhofstadt L. L. and Mikolajczak M. (2014). An integrative theory-driven positive emotion regulation intervention. *PLoS One*, 9 (4), e95677.
- Witkop, M., Lambing, A., Kachalsky, Divine, G., Rushlow, D. and Dinnen, J. (2011). Assessment of acute and persistent pain management in patients with haemophilia. *Haemophilia*, 17, 612-619. DOI: 10.1111/j.1365-2516.2010.02479.x
- Witkop, M., Lambing, A., Divine, G., Kachalsky, E., Rushlow, D. and Dinnen, J. (2012). A national study of pain in the bleeding disorders community: a description of haemophilia pain. *Haemophilia*, 18, e115-e119. DOI: 10.1111/j.1365-2516.2011.02709.x [Accessed 24th January 2017]
- World Federation of Hemophilia (2013). Report on the Annual Global Survey 2012. World Federation of Hemophilia. <http://www1.wfh.org/publications/files/pdf-1574.pdf> [Accessed 24th January 2017]

- World Health Organization Regional Office for Europe Copenhagen (1998). Therapeutic Patient Education , Continuing Education Programmes for Health Care Providers in the Field of Prevention of Chronic Diseases: Report of a WHO Working Group 1998, http://www.euro.who.int/__data/assets/pdf_file/0007/145294/E63674.pdf [Accessed 24th January 2017]
- Young, G., Tachdjian, R., Baumann, K. and Panopoulos, G. (2013). Comprehensive management of chronic pain in haemophilia. *Haemophilia*, 20, e113-e120. DOI:10.1111/hae.12349
- Zhou, Z.-Y., Wu, J., Baker, J.), Curtis, R., Forsberg, A., Huszti, H., Koerper, M., Lou, M., Miller, R., Parish, K., Riske, B., Shapiro, A., Ullman, M., and Johnson, K. (2011). Haemophilia Utilization Group Study - Part Va (HUGS Va): design, methods and baseline data. *Haemophilia*, 17, 729-736. DOI: 10.1111/j.1365-2516.2011.02595.x