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Abstract

Aims and objectives: To examine the development and impact of a multidisciplinary preparation clinic for patients undergoing Total Knee Replacement (TKR) surgery.

Background: There is evidence to suggest that patients' preoperative characteristics such as pain and mental state impact the long term results of TKR surgery.

Preparation sessions may help in identifying and working with those patients whose preoperative status could reduce the benefits of surgery.

Design: Action Research

Method: Actions cycles were carried out to develop an information booklet and multidisciplinary Knee Clinic at an acute Trust in outer London, UK. A sample (n=23) of patients was recruited to test changes as they were implemented

Results: The Knee Clinic involved nurse practitioners, occupational therapists, physiotherapists and service users (patients recovered from TKR surgery).

Elements of physical and social assessment and interventions were carried out using a Social Cognitive Theory framework. Patients reported they benefitted from the information booklet and attendance at the Knee Clinic

Conclusion: A structured pre-operative information and assessment clinic can be developed using a Social Cognitive Theory framework for the benefit of patients. Further studies are required to examine and utilise psychological assessment of patients at such clinics.

Keywords. Action Research, Social Cognitive Theory, total knee replacement, service user involvement, pre-operative assessment, practice development

INTRODUCTION

This paper examines changes made in the preparation of patients with osteoarthritis (OA) for Total Knee Replacement (TKR) surgery at an English district general hospital utilising an Action Research approach. TKR surgery is clinically and cost effective for patients whose OA is not successfully managed with conservative options and around 60,000 procedures are performed in England and Wales annually (Dakin et al., 2012). On average 90% of TKR prostheses are still in situ with no radiological signs of loosening 15 years after surgery (Labek et al., 2011). However 10-20% of patients have the same or worse pain one to seven years after their operation (Brander et al., 2003; Wylde et al., 2007) and up to one fifth think their reduced functional ability still hampers physical activities (Wylde et al., 2007). Potentially modifiable pre-operative patient characteristics such as pain and self-efficacy beliefs may impact on longer term post-operative outcomes, reducing the overall benefits obtained by the surgical procedure (Escobar et al., 2007; van den Akker-Scheek et al., 2007)

The aim of this project was to develop, implement and evaluate a multidisciplinary preoperative Knee Clinic to address these patient characteristics.

BACKGROUND

To identify modifiable pre-operative patient physical and psychosocial factors affecting longer term (greater than six weeks) post-operative outcomes after TKR surgery and potential interventions to mediate the effects of these factors a search of electronic databases (Cochrane, CINAHL, MEDLINE, EMBASE, PsycINFO) was performed to identify English language literature published since 2000. Older work was considered if it was seminal, such as that on self-efficacy (Bandura, 1977). Keywords included Total Knee Replacement, Total Knee Arthroplasty, pre-operative, post-operative outcomes. Thesaurus mapping and Boolean operands were used. Titles and abstracts were read to identify relevant articles and their reference lists scanned to identify further literature. Articles for inclusion were assessed for quality using published frameworks (Greenhalgh, 2001).

Much of the literature retrieved used mixed samples of TKR and Total Hip Replacement (THR) patients. Whilst the reasons for surgery and recovery profiles are generally similar they are not identical and therefore studies involving THR patients were included with caution.

Physical characteristics

Studies identified that pre-operative pain and function impact post-operative outcomes. Patients with more severe pain pre-operatively had higher pain levels up to two years post-surgery (Fitzgerald et al., 2004; Lingard et al., 2004; Escobar et al., 2007) and worse function at one year (Brander et al., 2003). Patients with poorer pre-operative function had poorer post-operative function at one year (Fitzgerald et

al., 2004; Lingard et al., 2004) although at two years post-surgery co morbidities and age were equally able to predict post operative function (Lingard et al., 2004).

In a systematic review exercise was demonstrated to reduce pre-operative pain for patients with knee OA awaiting TKR surgery, but there was little evidence that it impacted pain or function after TKR surgery (Wallis and Taylor, 2011). Pre-operative education alone did not reduce post-operative pain (McDonald et al., 2004; Johansson et al., 2005) and the psychosocial factors considered below need to be taken into account.

Psychosocial factors

Pre-operative psychological factors and social factors such as isolation may impact on the outcomes of TKR surgery. Poorer pre-operative psychological health has been reported as predictive of reduced function and higher pain levels at up to three years post surgery (Ayers et al., 2004; Lingard and Riddle, 2007; Gandhi et al., 2010; Vissers et al., 2012) and with dissatisfaction with the results of surgery at one year post surgery (Gandhi et al., 2008; Scott et al., 2010). Low self-rated overall pre-operative health was found to predict poorer social health (participation in socially expected life tasks and activities) at three months and mental well being at up to six months after TKR surgery (Perruccio et al., 2011). Post-operative health-related quality of life was not affected by socioeconomic status (Murray et al., 2006; Davis et al., 2008), but was impacted by environmental factors such as living conditions, availability of transport, health services and leisure activities at three years (Rat et al., 2010). Social support in the form of friends and family was linked with positive exercise behaviour before surgery (Campbell et al., 2001; de Jong et al., 2004) and helped improve patients' motivation after orthopaedic surgery (Resnick, 2002).

Personal factors within Social Cognitive Theory (SCT) of self-efficacy and outcomes expectation have also been shown to help explain post operative outcomes. Self efficacy is the conviction that one can successfully execute the behaviour required to produce the desired outcomes; outcome expectations is a person's estimate that a given behaviour will lead to particular outcomes (Bandura, 1977). Pre-operative self-efficacy beliefs have predicted post-operative function (Orbell et al., 2001; van den Akker-Scheek et al., 2007; Wylde et al., 2012). Pre-operative outcomes expectations and post operative functional recovery have been demonstrated to correlate at six weeks to one year post surgery (Orbell et al., 2001; Mahomed et al., 2002; Engel et al., 2004; Smith and Zautra, 2004). Patients with lower pre-operative expectations of post-operative pain had less pain at one year (Lingard et al., 2006) and satisfaction with TKR surgery at one year correlated with fulfilment of pre-operative expectations (Noble et al., 2006).

Self-efficacy beliefs are influenced by mastery experience (the individual's interpretation of results of previous performance), vicarious experience (observations of others), social persuasions (the verbal judgements of others) and somatic and emotional states (the emotional state experienced when an action or task is contemplated) (Bandura, 2004). Self-efficacy is context specific and requires knowledge of the task or action to be undertaken. There is evidence that patients want accurate information to support formation of realistic expectations for self-care (Edwards, 2002; Edwards, 2003; Marcinkowski et al., 2005). Patient knowledge has been increased by provision of written information prior to admission (Hodgkinson et al., 2000; Johansson et al., 2005) although effects were relatively moderate. Preoperative expectations were more realistic prior to TKR surgery following

preoperative education classes (Mancuso et al., 2008). Post-operatively monthly telephone follow-up by lay personnel improved self-care (Zhang et al., 2008) and booster sessions positively impacted exercise adherence in people with knee OA (Pisters et al., 2007). Interventions delivered through multimedia such as a CD increased self-efficacy beliefs in patients having THR surgery (Yeh et al., 2005). However, such interventions have been predominantly introduced close to the time of surgery which may have reduced their potential impact.

In summary, potentially modifiable pre-operative patient characteristics such as pain, mobility and psychosocial status may impact the outcomes of TKR surgery. Pre-operative preparation programmes may be a means of identifying appropriate patients and delivering interventions aimed at improving their physical and/or psychosocial states before surgery.

Preparation programmes for TKR surgery

Preparation programmes may be combined with pre-operative assessment (POA) or provided at separate education/assessment clinics. A recent impetus for this development in elective surgical care has come from the Enhanced Recovery Programme concept (Wainwright and Middleton, 2010; McDonald et al., 2011), which emphasised the importance of management of patient expectation through pre-operative education and counselling and of pre-operative interventions to optimise health and medical conditions. SCT can be used within preparation programmes to provide an environment to facilitate patients to alter their personal

beliefs about their capabilities and try to change their behaviours, for example by practising post-operative exercises prior to admission for surgery.

Programme formats have included a single session (MacDonald et al., 2005; Wainwright and Middleton, 2010), or a more intensive programme over many months (Berge et al., 2004). Group education sessions (Wainwright and Middleton, 2010; McDonald et al., 2011), individual assessments (Crowe and Henderson, 2003; Sandell, 2008) and a combination of both have been used (MacDonald et al., 2005; Nunez et al., 2006). Staff have included nurses, physiotherapists and/or OTs, with lesser involvement from other professionals such as orthopaedic surgeons, rheumatologists or psychiatrists (Giraudet-Le Quintrec et al., 2003); patients who have already had surgery have also been involved (Spalding, 2004).

Session content has entailed a combination of patient education, healthcare professional demonstration, patient participation in activities such as exercises and assessment of discharge needs (Prouty et al., 2006; Wainwright and Middleton, 2010; McDonald et al., 2011). There is little indication that psychological assessment or intervention has been undertaken but details of interventions undertaken were generally scanty. Few studies used a theoretical framework for their educational programme or described how they were developed or the factors influencing this.

Further, results were difficult to compare as a variety of outcome measures and time frames for measurement were used. A pre-operative multi-faceted intervention had a positive impact on the achievement of functional goals before surgery (Nunez et al., 2006) and up to one year after THR surgery (Berge et al., 2004; Siggeirsdottir et al., 2005). Self-efficacy and outcome expectations were improved (McGregor et al.,

2004) and preparation sessions were popular with patients (MacDonald et al., 2005; Sandell, 2008), reduced anxiety (Prouty et al., 2006) and led to a greater feeling of empowerment (Spalding, 2004).

Overall this literature demonstrated potentially modifiable pre-operative patient characteristics which impact post-operative outcomes of TKR surgery. Evidence for development and organisation of interventions to ameliorate these outcomes was less clear.

METHODS

Aims and objectives

The overall aim of the project was to develop, implement and evaluate a multidisciplinary Knee Clinic to improve patient preparation for TKR surgery. This paper examines what was developed in practice and its impact on patients; a second paper explores the change process (reference to follow).

Project design

The project used an Action Research design. Action Research is 'a period of inquiry, which describes, interprets and explains social situations while executing a change intervention aimed at improvement and involvement. It is problem-focused, context-specific and future-orientated' (Waterman et al., 2001, p11). There are many models of Action Research but the three key factors are participation, democratic impulse and a simultaneous contribution to social science and social change (Meyer, 2000). A cyclical process is employed where potential changes are *identified and planned*, introduced into practice (*implemented*) and the findings fed back to project participants so that learning can take place and future action cycles planned (*evaluated and reviewed*). In this study an iterative process of repeated small-scale cycles was used to test the feasibility and acceptability of the interventions and to evaluate (rather than trial) their impact.

The intervention

The project consisted of action cycles, with service service user involvement. One cycle related to the development of a patient information booklet, run concurrently with another series of cycles related to developing a multidisciplinary Knee Clinic. The researcher (BL) had previously developed a unidisciplinary 'Knee Club' at the research site, which included provision of verbal information for patients waiting for TKR surgery. This was expanded using Social Cognitive Theory (SCT) to frame the interventions. SCT provides a framework for understanding, predicting and changing human actions and identifies such actions as an interaction between personal factors, behaviours and the environment (Bandura, 1977; Bandura 1986).

Setting and sample

The project was undertaken at a UK outer London acute hospital NHS Trust over ten months (December 2005 – October 2006).

For the Action Research project a Project Management Group (PMG) was established at an initial launch event. Membership consisted of Trust staff and service users, who were patients who had had TKR surgery at the project site. Purposive sampling was used which means people were recruited based on their knowledge and insight of the topic under examination. Nineteen clinical and non-clinical staff members were approached via e-mail and 17 agreed to be involved. Ten service users from a clinical list of patients were contacted via telephone and five responded - three females and two males, with a mean age of 61 (range 57-73) years.

A sample of patients waiting for TKR surgery was recruited from the waiting list, to examine the impact of the changes on their experience. Twenty three patients consented to take part. Of these 17 had TKR surgery within the data collection period of the study, four after the study had ended and two decided they did not want to proceed with a TKR as their symptoms had improved.

Role of the researcher

The researcher (BL) was an insider within the organisation, working as a nurse practitioner assessing patients before TKR surgery and reviewing them in the outpatient clinic after surgery. Insiders studying their own organisation have 'preunderstanding': knowledge of their organisation's everyday life, jargon, informal organisational structure and what critical events are occurring (Coghlan, 2001). However they may make assumptions about what is being said or heard and can be denied access to relevant data due to hierarchical departmental boundaries (Coghlan, 2001). A reflective diary and discussion with academic supervisors (CC, LP, JB) was used to reduce the risk of assumptions being made.

Ethical considerations

The acute Trust's Research and Development Committee and the Local Research Ethics Committee approved the project. Consent in Action Research is a complex issue, as the project is a journey and neither researcher nor participants know exactly where this will take them in advance, hence they cannot fully know to what they are initially consenting (Williamson and Prosser, 2002). However initial written

consent was gained on the understanding that as the project unfolded members could opt out, which did not occur.

Data collection and analysis

Data were collected throughout the study in relation to the *planning, implementation, evaluation* and *review* stages of the action cycles. Action cycles were *planned*, and *reviewed* in nine monthly PMG meetings. The researcher took notes during PMG meetings which were distributed to PMG members for checking and correction. The researcher kept a reflective diary throughout the project, providing an audit trail and an account of project *implementation* and *review* processes.

The Knee Clinic was *evaluated* via observations undertaken by two PMG members using criteria previously described (Spalding, 2004) and agreed by the PMG.

To *evaluate* patient preparation for surgery patients completed two *evaluation* questionnaires at the Knee Clinic five months before surgery and again at the POA clinic two weeks before surgery. One tool collected data on the patients' perception of knowledge gain from attending the Knee Clinic and POA clinic and the other examined their self-efficacy and outcomes expectations after these clinics. No pre-existing validated questionnaires were identified for use so these tools were developed during the project by the researcher and agreed by the PMG members. The questions related to knowledge were based on the content of the Knee Clinic and the expert opinion of PMG members on what knowledge patients should gain from the Clinic. The self-efficacy and outcomes expectations questionnaire was also reviewed by a Consultant Psychologist to check consistency with SCT. Due to time

constraints their validity and reliability were not fully established and their results must be viewed with caution.

Patients' exercise frequency and crutches use prior to admission was *evaluated* via self-report. Physiotherapists' assessments *evaluated* the impact of these pre-operative activities on immediate post-operative mobility.

Nine of the 17 patients who had surgery reflected on (*evaluated*) their preparation for surgery in two focus groups held three months after their surgery.

Semi-structured interviews were carried out with staff at the end of the project, to reflect on (*evaluate* and *review*) the project and their involvement. These are explored in the second paper (reference to follow).

Qualitative data were analysed using Burnard's (1991) method, which included open coding and member checking. Quantitative data from the patient questionnaires were entered onto an Excel spreadsheet and descriptive statistics calculated.

Demonstration of rigour was addressed by maintaining an audit trail to enhance dependability and credibility. Details of the study setting and participants enable readers to consider the transferability of study findings.

RESULTS

Action cycle: Development of the information booklet

A 32 page patient information booklet which explained the patient pathway from listing for surgery to long term follow-up was developed through a series of action test cycles. It was designed to ensure that patients had an accurate understanding of preparation and recovery from TKR surgery to inform realistic self-efficacy and outcome expectation assessments.

The first test cycle involved collecting and examining existing patient information leaflets to identify areas for development. In subsequent test cycles draft booklets were reviewed by the PMG and patients at the Knee Clinic and in outpatients. The final version followed testing with patients at the Knee Clinic. The Hospital League of Friends agreed to fund printing of the booklet. Development of a DVD was discussed by the PMG but funding could not be identified.

The booklet incorporated details of self-management of pre-operative pain and used the principles of self-efficacy, for example photographs of exercises and crutches use featured service users rather than staff, to enhance vicarious experience.

Action cycle: Physical assessment and intervention in the Knee Clinic

A series of action test cycles developed elements of physical health assessment and intervention. An initial test cycle introducing a physical health questionnaire at the Knee Clinic was not continued as the hospital was planning a similar tool for use when patient's names were added to the waiting list. Subsequent test cycles

concentrated on physiotherapists teaching exercises and use of crutches so that patients could practice at home prior to admission (mastery experience). One cycle tested teaching of crutches on an individual basis at the POA clinic; this was not sustainable for the physiotherapists as it was difficult to predict when patients would be available for teaching. Further cycles tested ways of incorporating teaching of crutches use and post operative exercises within the Knee Clinic. This was achievable with the nurse practitioner measuring patients for the correct size of crutches at the beginning of the clinic session and physiotherapists teaching crutches use and the exercises during the session.

Action cycle: Social assessment and intervention in the Knee Clinic

A series of test cycles tested the introduction of early social assessment and intervention to ensure that patients were prepared for discharge and rehabilitation at home. After an initial scoping exercise by the occupational therapist (OT) subsequent tests involved devising and refining a home circumstances assessment form and piloting it in the Knee Clinic to determine if it identified patients who needed additional support. Assessments included measuring the leg length of the patients to check if they would require alteration to their furniture height after surgery; this proved disruptive when performed by the OT during the session but achievable with the nurse practitioner measuring both leg length and for crutches use at the beginning of the session.

Action cycle: Service user involvement in the Knee Clinic

A final series of test cycles led to service user involvement in the Knee Clinic. Two service users from the PMG attended the Knee Clinic in the first cycle to share their experiences of TKR surgery (vicarious experience) and reflected on the process at a subsequent PMG meeting. The PMG agreed that service user involvement should be developed and the feasibility of recruiting service users was tested via articles in the Trust magazine and in a local newspaper. Subsequently, an expression of interest letter sent to every patient who had had a TKR within the previous six months resulted in a pool of twenty service users for the Knee Clinic. A patient led support group – the Joint Information Group (JIG) – developed, with a rota of service users for the Knee Clinic and regular coffee mornings to enable patients post-surgery to meet and discuss their recovery. This is discussed further in the accompanying paper (reference to follow).

Achieving implementation of changes in practice

By conclusion of the series of action cycles changes had been successfully integrated into the patient admission process. The information booklet and the OT assessment form were given to patients by the Admissions Office together with an invitation to the Knee Clinic on the day their name was added to the waiting list. The researcher (BL) organised the rota of physiotherapists and OTs for the Knee Clinic and liaised with JIG for the rota of service users.

Observation of the Knee Clinic demonstrated that it consisted of a ninety minute session with the involvement of a nurse practitioner, physiotherapist, OT and service users. The nurse practitioner co-ordinated the session, performed the crutches and

leg length measurements, and provided education on aspects of preparation for surgery, the inpatient stay and recovery. The physiotherapist taught the group the post-operative exercises and the use of crutches, which patients took home with them. The OT assessed patients' home circumstances and arranged a pre-operative home visit if necessary. Service users shared their experiences of surgery and recovery with the patients. No psychological assessment or intervention had been introduced, beyond the self-efficacy/outcomes expectations questionnaires for the patient sample. The reasons for this are explored elsewhere (reference to follow).

Impact of changes on patients

Data from the patient questionnaires (Table1) and focus groups indicated that the patients felt prepared for surgery. This was as a result of increased knowledge and enhanced self-efficacy.

Increased knowledge

The patient focus group transcripts suggested that patients generally believed the Knee Clinic and information booklet increased their knowledge

We understood more, we had more information than a normal doctor would give you (Focus Group (FG) 1)

I think the information was pretty comprehensive ... I don't think you could add any more (FG 2)

The scores for the knowledge and preparation questionnaire (Table 1) were high at both points in time suggesting that the patients felt knowledgeable about, and

prepared for, their surgery following the Knee Clinic, and that this perception was generally well maintained over time. Actual knowledge gain was not measured as part of the study and could be examined in future studies.

Enhanced self-efficacy

Patients reported that knowing the correct way to use crutches and perform the post-operative exercises helped in developing self-efficacy and that they were able to develop realistic outcome expectations.

It did get you prepared for the operation and of course walking on crutches, having the crutches at home, it was a good idea, to get crutches and learn how to walk on them. (FG 1)

I think it helps because you have to get to a certain degree (*of knee flexion*) and they like you to be at that, so that helps you with knowing what you've got to do (FG 1)

Patients did not have the opportunity to be assessed using the crutches or performing the exercises in the Knee Clinic which meant that they did not receive positive reinforcement about their capabilities (social persuasion). Table 2 indicates the patients' reported self efficacy and outcomes expectations were high after the Knee Clinic and remained consistently so at the Pre-Operative Assessment clinic.

Some patients gained positive benefits from performing the exercises which they believed helped them both before and after surgery

I did all the exercises because I've got bad both legs and I found that, I do them now because I'm waiting for the other one to do. The physio people say

this is much stronger now (*the unoperated leg*) than when I started, which is good (FG 1)

The frequency with which patients reported practicing the exercises and crutches prior to admission for surgery varied (Table 3). There was some evidence of family influences.

'Luckily I had my grandchildren, my grandson has bad legs as well so we were doing our exercises together, which is great, we made it into a thing.'
(FG2)

Some patients perceived that following Knee Clinic advice pain was reduced and function improved:

This summer I have been undertaking your exercises and swimming a lot and my knees have been so good. I have come off all anti-inflammatories/pain killers and do not suffer too much pain at night anymore' (e-mail from patient, who decided not to proceed with TKR surgery)

Physiotherapists reported that some patients who had exercised and practiced crutches use before admission mobilised more quickly after surgery, indicating the positive impact of mastery experience.

Patients reacted positively to changes suggested by the OT to the home environment before admission for TKR surgery. These changes ranged from provision of furniture aids to more complex packages of care for patients or their relatives:

My biggest concern at that time was not the actual operation but the fact that I'm sole carer for my wife and arranging the respite for her. Once that had been put in place I was quite happy about it. (FG2)

DISCUSSION

The project demonstrates how an information booklet and a single education/assessment session can begin to address some of the patient physical and social characteristics which impact post-operative recovery, such as worse pre-operative pain (Lingard et al., 2004; Escobar et al., 2007) and function (Fitzgerald, 2004; Lingard et al., 2004). The test cycles demonstrated that these interventions were both feasible for clinicians and acceptable to patients. The teaching of exercises and crutches use so that patients could practice them before admission was based on the concept of mastery experience (Bandura, 1997) and the evidence that exercise is important in reducing pain and improving function in patients with knee OA (Wallis and Taylor, 2011).

The patient questionnaire and focus group data suggested that patients felt prepared for surgery and rehabilitation. The provision of written information such as the information booklet can increase patient knowledge (Hodgkinson et al., 2000; Johansson et al., 2005). Multimedia information may have been more effective (Yeh et al., 2005) but was not possible without funding. Patients lack information and need advice pre-operatively so that they can manage their OA symptoms before surgery and form realistic outcome expectations and goals for post-operative recovery (Orbell et al., 2001; van den Akker-Scheek et al., 2007; Wylde et al., 2012). The Knee Clinic provided verbal reinforcement of the information booklet and helped patients form realistic self-efficacy and outcome expectations about their surgery and rehabilitation. Other studies have used a similar combination with positive results on preoperative pain and function (Berge et al., 2004; Nunez et al., 2006). Service user involvement provided peer support and perhaps the opportunity for vicarious

experience, patients learning about the experience from others similar to themselves. Service user involvement was described in one other study (Spalding, 2004) where it consisted of a ten minute presentation only. By contrast, in this study the service users were present for the whole 90 minute session and contributed throughout to the explanations and discussions. However, no formal evaluation of this was sought or offered.

Lacking agreement of the PMG to proceed with this, the project did not include routine psychological screening of patients with regard to specific factors which may have impacted post-operative recovery such as self efficacy beliefs, outcome expectations or general psychological health status. Thus the interventions of the information booklet and Knee Clinic were not specifically tailored to individual patient's psychological needs. No studies including formal psychological assessment as part of preparation for TKR surgery were identified and further studies are required to examine this.

Pre-operative social factors potentially impacting post-operative outcomes were partially addressed through the OT assessment and interventions. Previous studies have described OT involvement in preparation programmes (MacDonald et al., 2005; Prouty et al., 2006) but no study has specifically examined the impact of early OT assessment and intervention on postoperative outcomes in TKR surgery. Findings suggest there may be benefits following OT intervention but more research is needed to establish this.

The changes implemented may have beneficially influenced the patients' behaviour and psychological beliefs and knowledge as their scores for these domains can be

considered high. However, these findings are tentative as the questionnaires designed for the project have not yet been thoroughly tested. Participants' scores for both questionnaires remained high, only reducing a little at the POA clinic appointment approximately two weeks before surgery. Participants may have become more anxious as surgery came closer, lowering their self-efficacy beliefs/outcome expectations and perceptions of knowledge. Self-efficacy and outcome expectations are context specific (Bandura, 1986) and the context of imminent surgery approximately five months after the Knee Clinic may have moderated patients' beliefs about their ability to manage the immediate preoperative and perioperative period. The Knee Clinic was designed to ensure patients had realistic outcome expectations about surgery and recovery and to address self-efficacy and outcome expectations about the immediate pre-operative stage. A follow-up session nearer the time of surgery may have been helpful, allowing patients the opportunity to consider beliefs about their imminent surgery. This would have resource implications.

The findings indicated differences in patient behaviours after the Knee Clinic and provision of the information booklet. The home environment may have impacted on the time patients spent practising the exercises and crutches. Some with support from relatives reported this encouraged them to practice, perhaps resulting in the greater amounts of practice also found in relation to exercise behaviour in patients with knee OA (Campbell et al., 2001; de Jong et al., 2004). Amounts of practice should have equated to patients' mastery experience in crutches use, which may also have been influential. Almost half the patients reported that they had practiced crutches a few times only or never before admission and this may have been

reflected in lower self-efficacy and outcome expectations. Findings of this study add to the argument that more consideration should be made to ongoing support for patients after the initial Knee Clinic, as previous studies have demonstrated that telephone follow-up (Zhang et al., 2008) or booster sessions (Pisters et al., 2007) increase exercise participation of patients with OA. Patients' intentions to exercise need to be examined further and appropriate support systems put into place.

The project has provided some evidence that SCT may be an appropriate theoretical framework for organising a preparation programme before TKR surgery for the benefit of patients. The information booklet and the Knee Clinic were designed to address the personal, environmental and behavioural factors impacting patient preparation for TKR surgery and recovery afterwards. The project was not able to introduce all the intended elements of SCT into the Knee Clinic and further studies are required which actively pay attention to factors such as measuring self-efficacy and outcome expectation beliefs, tailoring interventions to these, and evaluating their impact on patient actions.

Strengths and limitations of the project

The project was an example of Action Research in which an insider researcher worked with colleagues to change practice. The insider status allowed access to material and events which would have been difficult, if not impossible for an outsider to access using formal data collection methods. The project was conducted on one site, allowing an in-depth investigation of change in a particular setting within its environmental context. This adds credibility to the findings by allowing a rich picture

to emerge. It allows the reader to judge the 'fittingness' of the findings with their own particular settings and make a judgement about its usefulness in their own practice (Somekh, 2006).

The project had a short time frame of nine months, which limited what could be achieved. Further studies are needed on the impact of multidisciplinary preparation of patients for TKR surgery, as this study relied on questionnaires whose validity and reliability had not been established. A stronger evaluation framework is required to demonstrate effectiveness in relation to patient outcomes.

CONCLUSION

The project has demonstrated how Action Research can be used to make service changes and the positive impact these changes may effect on patients' preparation for TKR surgery. The project resulted in a multidisciplinary assessment and intervention Knee Clinic with service user involvement based on a SCT framework. Such clinics are vital if the aims of current initiatives such as the Enhanced Recovery Programme are to be met and cost and patient benefits from surgery maximised.

Contributions

Research design: BL, CC, LP; Data collection: BL; Analysis: BL, CC, LP, JB; manuscript preparation: BL, CC, LP, JB

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Outcome scale	*Knee Clinic	**Pre-Operative Assessment (POA) clinic
	Total sample n = 23 Completed questionnaires n = 23 Mean (SD)	Total sample n = 20 Completed questionnaires n = 19 Mean (SD)
Overall score (potential score = 20)	16.3 (2.1)	15.1 (3.1)
Knowledge score (potential score = 10)	7.7 (1.1)	7.3 (1.4)
Preparation score (potential score = 10)	8.6 (1.3)	7.7 (1.9)

Each of the 4 questions was scored on a scale of 1 (=Nothing/Not at all) to 5 (= Full knowledge/Well prepared). The total maximum score = 20. Higher score indicates greater knowledge/feeling prepared.

**5 months before surgery **2 weeks before surgery*

Table 1: Knowledge and Preparation scores

Outcome scale	*Knee Clinic	**Pre-Operative Assessment (POA) clinic
	Total sample n = 23 Completed questionnaires n = 23 Mean (SD)	Total sample n = 20 Completed questionnaires n = 19 Mean (SD)
Overall score (score = 0-32)	30.0 (2.1)	28.5 (2.3)
Self-efficacy score (score = 0-16)	14.7 (1.4)	13.4 (1.8)
Outcomes expectations score (score = 0-16)	15.3 (1.0)	15.1 (1.1)

*Higher score indicates greater self-efficacy beliefs/outcomes expectations

*5 months before surgery

**2 weeks before surgery

Table 2: Self-efficacy and outcome expectations scores

Frequency	Exercises (number of patients completing at this frequency)	Crutches use (number of patients completing at this frequency)
Every day	10	4
Most days	5	1
Once weekly	1	3
Less than weekly	0	1
Few times only	0	5
Did not perform	1	3

Table 3: Patient self-report exercise and crutches use pre-surgery: n=17 patients, 100% of those undergoing surgery