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Physical therapists' experiences of learning and delivering a complex behavioral medicine intervention to adolescents with pain

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ABSTRACT

The objective was to study physical therapists' (PTs') experiences of learning and delivering a complex intervention, a tailored behavioral medicine treatment (BMT) targeting adolescents with pain in primary care.

Method: An explorative study with qualitative approach, using content analysis. Three primary care PTs delivering the treatments in a randomized controlled study were interviewed regarding their views on the BMT.

Results: The participating PTs considered learning about and delivering the BMT as challenging but rewarding. The biopsychosocial approach, tailoring of the treatment and dialogues with parents were identified as key aspects of the BMT program. The process of formulating a functional behavioral analysis was perceived as strenuous. The supervision of the PTs throughout the study was regarded as crucial and necessary for learning about and providing tailored BMT.

Conclusion: Learning about and delivering BMT targeting adolescents with persistent pain is fruitful but laborious and demanding according to three PTs experienced with treatment of pediatric pain in primary care. Extensive education and long periods of supervision seem to be crucial for success and safe delivery according to protocol.

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Introduction

High incidence levels of musculoskeletal pain in adolescents have been established over the past years, approximately 8–32% experience weekly musculoskeletal pain, and up to 39% experience pain every month (King et al., 2011). The risk factors for musculoskeletal pain have only begun to be investigated and prognostic factors for pain-related disability has not yet been investigated (Huguet et al., 2016). Pain during childhood appears to increase the risk of developing persistent pain conditions in adulthood (Brattberg, 2004; Fearon and Hotopf, 2001).

Physical and psychological comorbidities in pain conditions are common. Also, negative impact on social and physical activities and school performance are well known (Clinch and Eccleston, 2009; Roth-Isigkeit et al., 2005). A biopsychosocial approach aids in the understanding of the multifaceted phenomenon of pain (Riddell, Racine, Craig, and Campbell, 2014). Combining PT and cognitive behavioral therapy improves functioning in children experiencing pain (Ayling Campos, Amaria, Campbell, and McGrath,

2011; Eccleston and Eccleston, 2004; Lee et al., 2002; Sherry et al., 1999). Physical therapist delivered cognitive-behavioral interventions are more effective than other guideline based treatments (Hall et al., 2018).

A growing body of research suggests that behavioral medicine treatment (BMT) is effective within the PT context for adults (Åsenlöf, Denison, and Lindberg, 2005; Bring, Åsenlöf, and Soderlund, 2016; Sandborgh, Lindberg, Åsenlöf, and Denison, 2010; Soderlund and Lindberg, 2001) but also in adolescents (Holm et al., 2016). Behavioral medicine (BM) embraces “the development and integration of psychosocial, behavioral and biomedical knowledge relevant to health and illness and the application of this knowledge to prevention, etiology, diagnosis, treatment and rehabilitation” (International Society of Behavioral Medicine, 2019). In the context of pediatric PT, BMT could include physical exercises and various methods for supporting adherence to exercise and other behavioral changes hindering optimal functioning. Examples of interfering factors are low self-efficacy, anxiety, catastrophizing/negative thoughts and pain-related fear (Carpino et al., 2014; Eccleston et al., 2004; Holm,

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Ljungman, Åsenlöf, and Soderlund, 2013; Simons and Kaczynski, 2012).

Hence, comprehensive intervention models that include multiple and interacting components are needed. Such interventions typically include tailoring and permitting various degrees of flexibility (Åsenlöf, Denison, and Lindberg, 2005; Coakley and Wihak, 2017; Craig et al., 2008; Kreuter and Skinner, 2000). Scientific study of the effects of new, complex interventions is important but challenging (Craig et al., 2008), and it is valuable to capture health-care professionals' experiences and opinions of learning and delivering such interventions.

Changing clinical behaviors is challenging and laborious (Grol and Grimshaw, 2003; Overmeer, Boersma, Main, and Linton, 2009; Schreiber, Stern, Marchetti, and Provident, 2009). To deliver BMT, physical therapists (PTs) need to learn the theoretical concepts underpinning BM approach and how to deliver behavioral change techniques (Holm et al., 2016). Little is known about PTs' experiences of learning about and delivering complex BMT intervention. The aim of the study was to explore PTs' experiences of learning and delivering a complex BMT intervention to adolescents with persistent musculoskeletal pain.

Methods

Context and participants

In Sweden, primary care is the health service provided in the local community and is intended for patients who do not require the technical and medical resources of hospitals or specialist care. PTs are often accessed through patient self-referral or physician referral, and many children and adolescents with pain-related problems visit a PT even before seeing a general practitioner. The PTs

employed in primary care are not specialized in pediatric care and are regarded as first line health care.

The present study is based on a previous randomized controlled trial (RCT) (Holm et al., 2016). In the RCT, the aim was to study the efficacy of tailored behavioral medicine treatment within a primary care physical therapy framework. The study participants in this study, were all the PTs (three PTs), that delivered the behavioral medicine treatment in the RCT. In the RCT the PTs treated 32 adolescents (12–16 years), who sought PT in primary care for a pain-related condition that had interfered with daily activities for more than three months (Holm et al., 2016). In the present study, PTs were interviewed about their experiences in delivering a BMT to adolescents with pain.

The PTs had 10 to 31 years of experience in the profession, none of the PTs had formal training in pediatrics or BM before the study began. All of them had a special interest and clinical experience in working with children. PT 1 had worked in primary care for 13 years and had 4 years of experience from working with children and adolescents. PT 2 had worked in primary care for 31 years and had 15 years of experience from working with children and adolescents as part of her clientele. PT 3 had worked in primary care for 10 years and had 4 years of experience from working with children and adolescents.

Setup and content of PTs' education in behavioral medicine treatment

The education the PTs received was delivered by two of the authors (SFH and AS) and comprised a total of 14 hours divided into four 3.5-hour seminars. The education covered the theoretical foundations of BMT and skills training in the components and specific behavior change techniques. An overview of the education is presented in Table 1.

Table 1. The content of PTs education in behavioral medicine treatment.

| | Session 1 | Session 2 | Session 3 | Session 4 |
|-----------------|---|--|---|--|
| Theory | Biopsychosocial model Theories; Operant Respondent Social cognitive Coping theory Fear avoidance Stages of change | Goal setting Self-monitoring Functional behavioral analysis (FBA) | Theoretical basis of treatment techniques; Physical Cognitive Emotional Social/environmental See Table 2 for details | Operant techniques to be used by patients and parents Lifestyle change techniques; Improve sleep and eating habits |
| Skills training | | How to identify goal activities and introduce self-monitoring FBA skills training | Introduction and practicing of treatment techniques | Parental work Repetition of treatment techniques in practice |
| Home-work | Repetition of theoretical background | Identification of goal and self-monitoring of behavior own health behavior | Practicing FBAs Applied skills training with non-study patients of treatment techniques | Monitoring of own learning process Assemble questions for supervision |

The PTs were provided with handouts from the seminars and a detailed treatment manual. The BMT workflow, was described in detail in the manual. In addition, a variety of physical, psychological and social treatment techniques useful when applying tailored BMT to adolescents were presented (Table 2). Information pamphlets and work-sheets for use with the patients were also provided.

In addition to this education, the first author tutored the PTs throughout the RCT (every week or every other week depending on the number of patients in treatment at the time). The majority of feedback sessions were group sessions with all three PTs. If someone was unable to attend, they could have supervision by Skype, telephone or choose to wait to the next opportunity. All the patients being in treatment at the time of the supervision session were discussed and challenges as well as what had worked well was elaborated. Depending in where in the treatment process the patients were, the assessment, the rationale for the chosen treatment components, progression of patients' treatment and other factors that the PTs perceived important were discussed. Supervision also included discussion of the adherence to and the theoretical foundations of the BMT. During the supervision, constructive feedback was given along with positive reinforcement for the PTs' clinical behavior.

Behavioral medicine treatment

The comprehensive manual guided the PTs on how to deliver the complex BMT intervention. The intervention targeted patient behavior changes in physical, emotional, cognitive and social and lifestyle factors required for overcoming the patients' pain related problems. The work flow for the BMT begun with taking pain history, identification of problems and goal activities, physical examination, self-monitoring of behaviors in goal activities, formulating functional behavior analysis (FBA) and identification of behavioral treatment goals. The process is described below:

- 1) Pain history – A detailed anamnestic interview using a biopsychosocial approach (Von Baeyer, 2007);
- 2) Identification of Problems and Goal Activities – The patients listed 2–3 important and frequent activities in which pain interfered (Åsenlöf and Siljeback, 2009);
- 3) Physical examination – A thorough physical examination focusing on areas of importance for the pain-related problem including screening for potential red flags (Gatchel, 2004); and
- 4) Self-monitoring – As a home assignment for the following session, the patients self-monitored their goal activity behaviors in a diary. Self-monitoring was aimed at increasing the patients' awareness of their actions, thoughts and emotions in the goal activity behaviors. The patients were asked to rate their self-efficacy before the activity and to monitor their bodily sensations, thoughts and emotions during the activity which were recorded in the diary (Carver and Scheier, 1982);
- 5) Functional behavior analysis and identification of behavioral goals - Together with the patients the PTs formulated hypotheses regarding the relationships among the physical, emotional, cognitive and environmental factors related to behaviors in goal activities based on the information obtained from anamnesis, physical examination, and self-monitoring (Haynes, Leisen, and Blaine, 1997). The PTs checked back with the patients that they had understood the essentials of the FBA by asking the patient to repeat the content that were agreed on.
- 6) Goal setting-SMART-goal (i.e. Specific, Measurable, Activity related, Realistic and Time-specified) (Siegert and Taylor, 2004) were set in communication with the patients and action plans for treatment was initiated. Each goal activity could comprise several behaviors that required change for improving function and skills acquisition.
- 7) Treatment-Based on previous behavioral medicine research targeting longstanding pain, all parts of the treatment followed four phases: 1) basic skills acquisition; 2) applied skills acquisition; 3) generalized

Table 2. Specific techniques in the behavioral medicine treatment.

| Physical* | Cognitive | Emotional | Social |
|---|---|---|---|
| Improve strength circulation Posture control, Range of motion, Stabilization/muscular control, Coordination, Aerobic fitness | Alter automatic negative or catastrophic thoughts Positive self-talk Distraction Problem solving | Pain or movement related fears (graded exposure) General anxiety (Worry time) Basic and applied relaxation training | Asking and getting support from friends Getting support from parents |

*The physical components included best clinical practices for exercises and followed recommendations for repetitions, load and intensity (Faigenbaum, Lloyd, and Myer, 2013).

skills acquisition; and 4) maintenance and relapse prevention. Systematic increase in self-efficacy was applied in all skills training. Hence, more challenging exercises and behaviors were systematically introduced in physical, cognitive, emotional and social skills training (Åsenlöf, Denison, and Lindberg, 2005; Holm, 2014; Holm et al., 2016; Sandborgh, Lindberg, Åsenlöf, and Denison, 2010).

Based on each individual participant's FBA and identified barriers to behavior change, the PTs could choose BMT techniques from the treatment manual aiming at supporting behavioral change and physical functioning. A brief pain education based on a biopsychosocial model was introduced to all patients.

In every session a new home assignment was given for the patients. Every session included a feed-back discussion to support new behaviors, using the framework from learning theories (i.e. respondent, operant learning theories, and social cognitive theory). The patients were asked to repeat the description of the home assignment in order to facilitate learning and to avoid misunderstanding.

The parents were invited to a session without their child. The session included pain education based on a biopsychosocial model and how parents could support their children in behavior change (Palermo, 2012). Written advice about reinforcing their children's behavioral changes were handed out. For details, see Holm (2014) and Holm et al. (2016).

Data collection

The PTs participated in a group interview that explored their experiences of learning about and delivering a BMT program after the RCT was completed. The rationale for group interviewing was to capture the collective understanding by stimulating the interplay between the PT's during the interview. The interaction between study participants can be viewed as a part of the method, especially when the collective knowledge is more of interest than that of a sole participant (Ivanoff and Hultberg, 2006; Kitzinger, 1995). The rationale was to aggregate a variety of viewpoints, opinions and comments regarding different aspects and to develop common perceptions of the PT's experiences. A semi-structured interview guide with open-ended questions covering the following areas was used: the perceived benefits and challenges of applying the BMT, views on its content, and thoughts about the education and practical training for the BMT. Follow-up questions were used when further clarification was needed.

Before the interview a discussion on expectations for the interview, emphasizing a strive for honesty and sharing of all experiences was initiated by the interviewer. The interview was recorded on an Olympus Digital Voice Recorder DS-2800 and lasted 45 minutes.

Data analysis

The interview was transcribed verbatim by a research assistant, and content analysis was performed following Graneheim and Lundman (2004) guidelines. The interview was read several times by the first (SFH) and last author (AS) to obtain an overall sense of the content. Only data that was related to the aim of the study was analyzed further. The text was analyzed in several steps. Two researchers (SFH and AS) individually searched the transcribed text for meaning units. Thereafter, the first author continued the process by condensation and abstraction, which involved shortening the meaning units without losing the core. Thereafter, each meaning unit was labeled by a code. In the next step, codes were merged into subcategories and categories with a special focus on assessment of similarities and differences in the meaning units, and to stay close to the manifest data. Measures to ensure trustworthiness were implemented during the analysis, in the selection of meanings units, in the way data was sorted and labeled, and when the categories emerged. The trustworthiness measures were the following: all the steps in the analysis process were repeated and compared with the transcribed text from the interview to verify the content until full consensus was achieved. The analysis went back and forth between codes and emerging subcategories in search of a reliable systematization with exclusive categories, and we strived to merge categories without losing any essential data. This triangulation promoted a deeper and broader understanding by using the authors experience (SFH, PÅ, GL and AS) and their different viewpoints. SFH had experience from clinical work within pediatrics and persistent pain in children, GL from work as a pediatrician specialized in pain, AS from applying BMT in clinical work with adults with whiplash disorders, and PÅ from applying BMT at a specialized pain clinic. AS and PÅ had extensive experience from supervising PhD students and researchers performing BMT studies. All authors had education in qualitative methods and research experience in qualitative methods. Categories are illustrated using representative quotations from the transcribed text. Quotations from all three PTs are used and labeled as PT 1, PT 2 and PT 3. The quotations were translated by a professional translator verbatim from

Table 3. Categories, subcategories and codes.

| Categories | Subcategories | Codes |
|---------------------------------------|------------------------------------|---|
| Learning BMT | | |
| Learning the theoretical concepts | Theory and new words | Theoretical New/Difficult words |
| | Well-balanced content | Extent of theory good |
| | Challenging concepts | FBA hard to learn To sort information difficult |
| Support in learning | Study cases | Examples of patients best |
| | Written materials | Manual good for learning Poster of BMT in treatment room |
| Understanding in practice | Theory anchored | Theory landed when meeting patients Understanding of theory progressed |
| | Supervision as learning | Supervision best for learning Supervision better than written materials |
| The need to feel confident | Rehearsal | Repetition to feel secure |
| | Improving skills | More knowledge for increased confidence Better when using a technique a few times |
| Delivering BMT | | |
| Positive perceptions | Holistic approach | More than biomedicine Working with whole person Positive gut feeling |
| | | Working toward a goal |
| | Satisfaction with BMT | Underline self-management Distraction useful Tailoring |
| | Parental work pillar for success | Joy when patient altered behavior Chance for parents to ask Alter parents' thoughts about pain Guiding parents how to support Make deals with parents |
| Frustrations | Abundant information | Gathering data for FBA took time Hard to fit it all in |
| | Insufficient results disappointing | Consequences difficult Hard when little change |
| | Excessive problems | Simultaneous pain problems Life problems |
| Dual experiences | Analysis crucial | Assessment and analysis critical Treatment onset delayed |
| | Self-monitoring | Facilitates insight Help in discussions Hard when data were sparse |
| Behavioral medicine in daily practice | Thoughts and behaviors | Thoughts altered not behaviors Behaviors altered not thoughts |
| | Positive outcomes | Better long-term outcomes Use new knowledge for all patients |
| Practical prerequisites | Continued supervisions | Supervision necessary |
| | Manual a must | Manual structure and order Manual provided confidence Pre-set explanations aided |
| | Understanding colleagues | Visits longer Time for reflection Understanding colleagues |

Swedish to English without any modifications to their meaning.

Results

Two domains were formed: 1) Learning about BM; and 2) delivering the BMT. Categories and representative quotations for each category are described below. Table 3 provides an overview of domains, categories, sub categories and codes.

Learning about behavioral medicine

Four categories on the PTs' views of learning about BM formed this domain: 1) learning the theoretical concepts; 2) support in learning; 3) understanding in practice; and 4) the need to feel confident.

Learning the theoretical concepts

This category comprised three subcategories: 1) Theory and new words; 2) Well-balanced content; and 3) Challenging concepts.

The education in BM was perceived as challenging because of the complexity of the theoretical content and new vocabulary. Nevertheless, the PTs stated that the extent of education about theoretical concepts was adequate.

“There were a lot of pretty unfamiliar words, and it was not all that easy to see how this would be translated into practice. But just like you say, with feedback during the patient meeting, it became clearer.” (PT 2)

In particular, FBA was difficult to grasp and required a large time investment.

“You need a lot of time to grasp that (FBA). So that it flows, so that you see it instantly. Here’s this, there’s that ... These are the consequences, this is ... ” (PT 1)

Support in learning

Two subcategories formed this category: 1) Study cases; and 2) written materials. A few factors were mentioned as particularly helpful in supporting learning. The benefits of using the study manual during the training course and having a reminder of the BM workflow in the treatment room were emphasized.

“It’s (the manual) been very thorough and helpful. It’s been very detailed and usable. It’s probably been a prerequisite for carrying out this type of study.” (PT 1)

PTs considered concrete examples of patient cases as highly valuable and the greatest contributor to learning BM principles.

“The thing that was the most educational was when you had concrete examples to bring up, give suggestions. Like, for instance, when we were talking about ABC and FBA. When introduced to a patient case, that facilitated understanding, so it wasn’t just words ... ” (PT 3)

Understanding in practice

This category comprised two subcategories: 1) Theory anchored; and 2) supervision as learning. A vast amount of learning occurred when PTs met with the patients. The PTs stated that supervision when meeting the patients’ and during the learning process was crucial, and they valued their contact with the supervisor more than the written educational materials. Theoretical knowledge was anchored, and new questions arose during supervision, contributing to PTs’ increased understanding.

“The supervision was like an education in itself, which was really valuable. Then it is all about concrete patient cases, and that was extremely educational. So, the supervision was very important.” (PT3)

The need to feel confident

The two subcategories: 1) Rehearsal; and 2) improving skills formed this category. The need to feel confident and reflections on how to achieve confidence with BM principles in terms of analysis and treatment were shared. The PTs expressed a desire for further knowledge and rehearsal in practice in using the behavioral change tools to increase their confidence.

“I do feel like I could use more knowledge on several of these techniques really ... to feel completely secure. But then of course, the more times you use the various techniques, the more secure you feel.” (PT 3)

Delivering the BMT

In this domain, the PTs’ challenges and rewarding experiences in delivering the BMT were explored. Five categories were identified: 1) Positive perceptions; 2) Frustrations; 3) Dual experiences; 4) Practical prerequisites; and 5) BM in daily practice.

Positive perceptions

This category comprised four subcategories: 1) Holistic approach; 2) working toward a goal; 3) satisfaction with BMT; and 4) parental work pillar for success. The PTs highly appreciated the holistic approach of BM and its purpose to tailor the treatment. PTs stated that the patients found identifying and prioritizing important activities and behaviors to be straightforward, and they easily understood the purpose of working with a goal activity. The PTs found it valuable to return to the behaviors in goal activities when introducing or justifying appropriate new exercises or techniques. The contents of the BMT and the tailoring of treatment were perceived as helpful, and the distraction technique was regarded as particularly useful. The behavioral change concept also contributed to the patients’ understanding of their responsibility for self-managing pain problems.

“It’s been easy for the patients to identify important activities and stuff and things they want to come to grips with. Also ranking and prioritizing and everything ... capturing whatever the patient feels is the most important to work with at that time ... ” (PT 1)

Dialogues with parents altered the parents’ thoughts about pain and understanding of their role in their children’s pain-related problem. It was satisfying for the PTs to have a structured outline for the parental session and ensuring that the parents were involved in the treatment by giving them practical advice.

“The structured parent dialog was really good. To do that separately with the parent and sort of make a deal

about what we'd be working on ... I thought that was really good. (PT 2)

Frustrations

Here three subcategories were identified: 1) excessive problems; 2) insufficient results disappointing; and 3) abundant information. The PTs expressed some frustrations. They found it challenging when the BMT process did not work as planned or at times when a participant had several either simultaneous or excessive pain-related problems.

“(Frustrating) when there were so many factors to consider. Well, unfocused too, when a patient comes and brings up new stuff each time, new thoughts ...”, “... one girl, she learned it theoretically, but there was a lot that interfered with it as well. I think, a lot of psychological mechanisms. I think she would have needed another type of treatment as well ... with a psychologist or a social worker.” (PT 1)

The PTs perceived disappointment and discontentedness when behavioral changes did not occur, and some patients were perceived as needing treatment from other health professionals. The PTs perceived the process of collecting the required information for the FBA, as well as discussing and formulating the FBAs together with the patients as both time consuming and challenging.

Dual experiences

The PTs expressed contradictory views regarding some parts of the treatment and this category comprised three subcategories: 1) analysis crucial; 2) self-monitoring; and 3) thoughts and behaviors. They expressed ambivalence regarding the initiation of treatment. Although they considered allotting time for assessment and analysis both important and acceptable the PTs perceived impatience regarding the amount of time spent before the actual treatment began and expressed frustration about not beginning actual treatment during the patient's first visit.

Detailed self-monitoring diaries facilitated conversation, treatment and patients' insight. However, the PTs found it challenging when patient's entered limited information in their diaries. The diary was perceived as too comprehensive and in need of further development.

“The ones who did that (completed the diary), you could tell it had an effect. That they really gained insights about their patterns. It was often helpful to go back to it during treatment so they could see their own behaviors.” (PT 3)

The PTs expressed that they perceived joy when the patients' thoughts and behaviors were changed during

the treatment. They expressed that occasionally neither the patients' thoughts nor behavior were modified though the PTs strived for both to happen.

Behavioral medicine in daily practice

This category comprised two subcategories: 1) positive outcomes; and 2) continued supervisions. The PTs perceived that the patients would experience long-term positive outcomes because they learned new things and changed their behavior. The PTs regarded the behavior change techniques in the treatment manual as valuable and used them for other patients who were not included in the study. The PTs expressed strong beliefs in the principles of BM. They emphasized that they needed long-term supervision to work with BM in daily practice.

“I believe in this type of treatment.” (PT 1)

Practical prerequisites

Two subcategories formed this category: 1) manual a must; and 2) understanding colleagues. The detailed manual, which provided both theoretical background and explicit treatment techniques, was regarded as required to conduct BMT. The manual promoted feelings of confidence and work structure, and explanations from the manual were used in conversations with the patients and parents. The PTs reported difficulties attributed to insufficient time, as the BMT was perceived as more time consuming than the everyday treatment provided at the clinic. An understanding of the BM working procedure in the work unit and the acceptance of fewer daily patient appointments were regarded as necessary.

“At a clinic where you work like this, there needs to be understanding and acceptance of these methods and what they entail. Coworkers and management need to have informed knowledge about this type of work.” (PT 2)

Discussion

This study explored PTs' experiences with the implementation of a complex BMT within a PT framework for adolescents with persistent pain in primary care. Learning and to deliver the BMT was perceived strenuous but rewarding. The findings could be interpreted as that, BMT, at least with supervision, may be a feasible treatment for youth with pain in primary care.

The PTs expressed many positive aspects regarding the BMT. In particular, using the holistic biopsychosocial approach with tailored treatments, working with

and returning to patients' goal activities, and working with parents. Using of a biopsychosocial model and tailoring of treatment has been demonstrated to improve long term outcomes (Coakley and Wihak, 2017; Riddell, Racine, Craig, and Campbell, 2014). Thus, the PTs highly valued the treatment approach that in other studies have shown to offer benefits.

The dialogues with parents were regarded as important. It is known that parents' attention to pain complaints and activity restrictions are related to children's level of disability (Claar, Simons, and Logan, 2008; Peterson and Palermo, 2004; Walker, Garber, and Greene, 1993). Parents also often experience frustration and helplessness when their children suffer from pain. To incorporate instructions for parents into pain treatment, especially using operant strategies for reinforcing positive behaviors and adaptive coping has shown to be effective (Palermo et al., 2010). In the present study, the PTs expressed that the structure for the BMT gave them opportunity to do good work with parents, and they called the work with parents "a pillar of success" of the BMT. With limited time in Primary care, having a pre-determined work structure is supportive, as opposed to having to develop new ways of working with every family.

To teach the patients to use different distraction techniques was also mentioned by the PTs as particularly helpful. There is a large body of empirical support for using distraction, which can be both external doing something else and cognitively oriented (i.e. mind games and thinking about something else) (Cohen, Cousins, and Martin, 2014; Piira, Taplin, Goodenough, and Von Baeyer, 2002; Uman et al., 2013). Distraction can be used under different circumstances both when exposed to challenging activities that may involve fear and during painful procedures or treatments' (e.g. stretching a short tendon) (Tupper, Swiggum, O'Rourke, and Sangster, 2014).

The PTs considered some aspects of the BMT to be especially challenging, particularly the patients' self-monitoring and FBA. When self-monitoring worked well, it was valuable; however, it was troublesome when the information in the diaries was sparse. Self-monitoring has shown to be useful to influence physical activity behavior. In a recent Meta-regression Eckerstorfer et al. (2018) investigated the 5 most frequently used behavior change techniques using the definitions by Michie et al. (2011) for improving physical activity behaviors. They found self-monitoring to be one key factor leading to greater intervention success. The PTs expressed that the paper diary was troublesome to use at times. Simplifying the diary, for example, through the use of electronic devices, is likely

to increase the probability of obtaining sufficient and reliable information of patient's behavior in chosen activities (Stinson et al., 2013).

The PTs found it difficult to formulate the FBAs and time consuming to be able to implement them in the clinic. However, FBA is vital for tailoring treatment (Kreuter and Skinner, 2000) and was in fact a prerequisite for applying the BMT. The education of PTs may have failed to include the theoretical foundation needed to understand the rationale behind FBA (Haynes, Leisen, and Blaine, 1997), and the skills training may have been insufficient. The patients' specific FBAs were often discussed during supervision. The clinical application of FBAs has previously been shown to be challenging for PTs. FBAs conducted by PTs who are new to BMT often contains more general descriptions of the patients' life situations rather than hypotheses regarding the physical and cognitive determinants of a specific behavior (Sandborgh, Åsenlöf, Lindberg, and Denison, 2010).

On the whole, the PTs considered their theoretical training in BM to be challenging but sufficient. However, they expressed a wish to feel more confident, indicating a desire for increased knowledge and skills. The education was brief, and a longer, more substantial education could have assisted learning and facilitated even stronger confidence in using a BM approach. To further assist the PTs learning BM and enhancing behavioral change repetition and feedback on performance was given to the PTs throughout the study. The supervision of PTs provided throughout the study was regarded as crucial for learning about BM. Active implementation strategies such as ongoing feedback and skills training are effective when changing clinical behavior (Grimshaw et al., 2001). It would have been interesting to have assessed possible alterations in the PTs' self-efficacy regarding their perceived performance capability when assimilating and putting new skills into practice. Demmelmaier et al demonstrated that PTs with progressively challenging training could improve their acknowledgement and handling of patients' pain-related cognitions and emotions (Demmelmaier, Denison, Lindberg, and Åsenlöf, 2012).

The intervention the PTs were asked to deliver was a complex, multi-component intervention aiming at encompassing a wide range of factors that influence pain. Physical, cognitive and emotional factors were approached all tailored to the patient's specific needs. In the RCT where the PTs delivered the BMT, a suboptimal agreement was found between the patients' scores for catastrophizing, pain-related fear and self-efficacy and introduction to the specific behavioral change techniques influencing these aspects (Holm et al., 2016). Although

the PTs in our study indicated that the amount of education and training before the study onset was sufficient, it is still plausible that more extensive education could have facilitated better implementation of the BMT. Complex interventions are at higher risk for the degradation of the intervention (Perepletchikova and Kazdin, 2005) and it may be that the intervention we asked the PTs to deliver was too complex to be delivered. The PTs in this study indicated that the detailed treatment manual was a prerequisite for delivering the BMT. Still, it was challenging for the PTs to deliver the intervention. Even if the PTs really believed in the BMT, they were frustrated over not being able to treatment the patients the way they were used to. All three PTs had extensive experience in clinical work. Studies have shown that it is difficult for more senior clinicians to change their behavior even if they acknowledge the evidence supporting new treatment approaches (Overmeer, Boersma, Main, and Linton, 2009; Schreiber, Stern, Marchetti, and Provident, 2009).

Some methodological aspects and limitations should be considered when interpreting the results. A strength was that the PTs were interviewed together. The interactions between the informants provided rich data, and insights from one PT could be illuminated from a different perspective by another PT. The PTs were comfortable with each other and were not afraid to express contradictory views (Kitzinger, 1995; Parsons and Greenwood, 2000). However, the group format could also be a weakness. It could be argued that the responses of each PT were not truly independent because the PTs might have affected one another's thinking (Parsons and Greenwood, 2000). Before starting the interview, a short discussion on rules for the interview took place; the interviewer and informants agreed on that there were no right or wrong answers, and that all thoughts and comments are important and to strive for honesty in the discussion. Still, even if taking these precautions, the interviewer was a former colleague and the supervisor during the feasibility RCT. It is possible that the PTs' responses were influenced by what they believed they were expected to say, and they may have held back thoughts and/or given responses that they perceived to be desired. Another limitation is that only one group with three PTs were interviewed. Thus, the results might have been somewhat different if we had several groups of PTs. However, this group consisted of all the PTs, that delivered the behavioral medicine treatment in the RCT we conducted. In future studies and/or when BMT is implemented in the clinical settings it is important to include more PTs and continue to gather data on the barriers and challenges for PTs and to find solutions to make the implementation easier.

When analyzing qualitative data, there is not one true interpretation, there are always multiple ways to interpret the data. The trustworthiness of the interpretation was strengthened by repeated discussions among the authors (SFH, AS, PÅ) during the analysis. We chose also to remain close to the manifest content of the data. We repeatedly discussed the subcategorization and categorization and compared continuously the data with the transcribed text to achieve credible analysis leading to the final version of categorization being formed in consensus (Graneheim and Lundman, 2004).

The transferability of our findings may be limited to similar primary care settings and PTs with experience of treatment of pediatric pain in primary care. The PTs in this study had long experience from clinical work in primary care, but none was specialized in pediatrics. They did not have any formal training in pediatric PT but all had experience from treating children and adolescents during many years. Further, all of them had extensive experience from work with pain-related problems in adults. With regard to credibility of findings, it is plausible that some aspects of the experience of a PT learning about and delivering BMT were not explored. However, the study still contributes with new insights of this process. In future BMT studies or when implementing BMT in the clinic, it would be valuable to continue to study the experiences from PTs, preferably from PTs with different backgrounds, and in different settings.

Conclusion

Learning about and delivering BMT targeting adolescents with persistent pain is fruitful but laborious and demanding according to three PTs experienced with treatment of pediatric pain in primary care. Extensive education and long periods of supervision seem to be crucial for success and safe delivery according to protocol.

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Disclosure statement

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References

- Åsenlöf P, Denison E, Lindberg P 2005 Individually tailored treatment targeting activity, motor behavior, and cognition reduces pain-related disability: A randomized controlled trial in patients with musculoskeletal pain. *Journal of Pain* 6: 588–603.
- Åsenlöf P, Siljeback K 2009 The Patient Goal Priority Questionnaire is moderately reproducible in people with persistent musculoskeletal pain. *Physical Therapy* 89: 1226–1234.
- Ayling Campos A, Amaria K, Campbell F, McGrath PA 2011 Clinical impact and evidence base for physiotherapy in treating childhood chronic pain. *Physiotherapy Canada* 63: 21–33.
- Brattberg G 2004 Do pain problems in young school children persist into early adulthood? A 13-year follow-up. *European Journal of Pain* 8: 187–199.
- Bring A, Åsenlöf P, Soderlund A 2016 What is the comparative effectiveness of current standard treatment, against an individually tailored behavioural programme delivered either on the Internet or face-to-face for people with acute whiplash associated disorder? A randomized controlled trial. *Clinical Rehabilitation* 30: 441–453.
- Carpino E, Segal S, Logan D, Lebel A, Simons LE 2014 The interplay of pain-related self-efficacy and fear on functional outcomes among youth with headache. *Journal of Pain* 15: 527–534.
- Carver CS, Scheier MF 1982 Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin* 92: 111–135.
- Claar RL, Simons LE, Logan DE 2008 Parental response to children's pain: The moderating impact of children's emotional distress on symptoms and disability. *Pain* 138: 172–179.
- Clinch J, Eccleston C 2009 Chronic musculoskeletal pain in children: Assessment and management. *Rheumatology* 48: 466–474.
- Coakley R, Wihak T 2017 Evidence-based psychological interventions for the management of pediatric chronic pain: New directions in research and clinical practice. *Children* 4: 1–18.
- Cohen L, Cousins L, Martin S 2014 Procedural pain distraction. In: McGrath P, Stevens B, Walker S, Zempsky E (Eds) *Oxford textbook of paediatric pain*, pp. 553–557. Oxford, UK: Oxford University Press.
- Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M 2008 Developing and evaluating complex interventions: The new Medical Research Council guidance. *BMJ* 337: a1655.
- Demmelmaier I, Denison E, Lindberg P, Åsenlöf P 2012 Tailored skills training for practitioners to enhance assessment of prognostic factors for persistent and disabling back pain: Four quasi-experimental single-subject studies. *Physiotherapy Theory and Practice* 28: 359–372.
- Eccleston C, Crombez G, Scotford A, Clinch J, Connell H 2004 Adolescent chronic pain: Patterns and predictors of emotional distress in adolescents with chronic pain and their parents. *Pain* 108: 221–229.
- Eccleston Z, Eccleston C 2004 Interdisciplinary management of adolescent chronic pain: Developing the role of physiotherapy. *Physiotherapy* 90: 77–81.
- Eckerstorfer LV, Tanzer NK, Vogrinic-Haselbacher C, Kedia G, Brohmer H, Dinslaken I, Corcoran K 2018 Key elements of mHealth interventions to successfully increase physical activity: Meta-regression. *JMIR mHealth and uHealth* 6: e10076.
- Faigenbaum AD, Lloyd RS, Myer GD 2013 Youth resistance training: Past practices, new perspectives, and future directions. *Pediatric Exercise Science* 25: 591–604.
- Fearon P, Hotopf M 2001 Relation between headache in childhood and physical and psychiatric symptoms in adulthood: National birth cohort study. *BMJ* 322: 1145.
- Gatchel RJ 2004 Musculoskeletal disorders: Primary and secondary interventions. *Journal of Electromyography and Kinesiology* 14: 161–170.
- Graneheim UH, Lundman B 2004 Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today* 24: 105–112.
- Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, Grilli R, Harvey E, Oxman A, O'Brien MA 2001 Changing provider behavior: An overview of systematic reviews of interventions. *Medical Care* 39: 112–145.
- Grol R, Grimshaw J 2003 From best evidence to best practice: Effective implementation of change in patients' care. *Lancet* 362: 1225–1230.
- Hall A, Richmond H, Copsey B, Hansen Z, Williamson E, Jones G, Fordham B, Cooper Z, Lamb S 2018 Physiotherapist-delivered cognitive-behavioural interventions are effective for low back pain, but can they be replicated in clinical practice? A systematic review. *Disability and Rehabilitation* 40: 1–9.
- Haynes SN, Leisen MB, Blaine DD 1997 Design of individualized behavioral treatment programs using functional analytic clinical case models. *Psychological Assessment* 9: 334–348.
- Holm S 2014 Children and adolescents with pain in primary care: Biopsychosocial determinants and behavioral medicine treatment in a physical therapy framework. (Dissertation/Thesis). Uppsala University: Uppsala. <http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A708562&dswid=-6653>.
- Holm S, Ljungman G, Åsenlöf P, Linton SJ, Soderlund A 2016 Treating youth in pain: Comparing tailored behavioural medicine treatment provided by physical therapists in primary care with physical exercises. *European Journal of Pain* 20: 626–638.
- Holm S, Ljungman G, Åsenlöf P, Soderlund A 2013 How children and adolescents in primary care cope with pain and the biopsychosocial factors that correlate with pain-related disability. *Acta Paediatrica* 102: 1021–1026.

- Huguet A, Tougas ME, Hayden J, McGrath PJ, Stinson JN, Chambers CT 2016 Systematic review with meta-analysis of childhood and adolescent risk and prognostic factors for musculoskeletal pain. *Pain* 157: 2640–2656.
- International Society of Behavioral Medicine 2019 <https://www.isbm.info/about-isbm/>.
- Ivanoff SD, Hultberg J 2006 Understanding the multiple realities of everyday life: Basic assumptions in focus-group methodology. *Scandinavian Journal of Occupational Therapy* 13: 125–132.
- King S, Chambers CT, Huguet A, Macnevin RC, McGrath PJ, Parker L, Macdonald AJ 2011 The epidemiology of chronic pain in children and adolescents revisited: A systematic review. *Pain* 152: 2729–2738.
- Kitzinger J 1995 Qualitative research. Introducing focus groups. *BMJ* 311: 299–302.
- Kreuter MW, Skinner CS 2000 Tailoring: What's in a name? *Health Education Research* 15: 1–4.
- Lee BH, Scharff L, Sethna NF, McCarthy CF, Scott-Sutherland J, Shea AM, Sullivan P, Meier P, Zurakowski D, Masek BJ, et al. 2002 Physical therapy and cognitive-behavioral treatment for complex regional pain syndromes. *Journal of Pediatrics* 141: 135–140.
- Michie S, Ashford S, Sniehotta FF, Dombrowski SU, Bishop A, French DP 2011 A refined taxonomy of behaviour change techniques to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy. *Psychology and Health* 26: 1479–1498.
- Overmeer T, Boersma K, Main CJ, Linton SJ 2009 Do physical therapists change their beliefs, attitudes, knowledge, skills and behaviour after a biopsychosocially orientated university course? *Journal of Evaluation in Clinical Practice* 15: 724–732.
- Palermo TM 2012 Parental intervention strategies. In: *Cognitive behavioral therapy for chronic pain in children and adolescents*, pp. 92–105. New York: Oxford University Press.
- Palermo TM, Eccleston C, Lewandowski AS, Williams AC, Morley S 2010 Randomized controlled trials of psychological therapies for management of chronic pain in children and adolescents: An updated meta-analytic review. *Pain* 148: 387–397.
- Parsons M, Greenwood J 2000 A guide to the use of focus groups in health care research: Part 1. *Contemporary Nurse* 9: 169–180.
- Perepletchikova F, Kazdin AE 2005 Treatment integrity and therapeutic change: Issues and research recommendations. *Clinical Psychology: Science and Practice* 12: 365–383.
- Peterson CC, Palermo TM 2004 Parental reinforcement of recurrent pain: The moderating impact of child depression and anxiety on functional disability. *Journal of Pediatric Psychology* 29: 331–341.
- Piira T, Taplin JE, Goodenough B, Von Baeyer CL 2002 Cognitive-behavioural predictors of children's tolerance of laboratory-induced pain: Implications for clinical assessment and future directions. *Behaviour Research and Therapy* 40: 571–584.
- Riddell R, Racine N, Craig K, Campbell L 2014 Psychological theories and biopsychosocial models in paediatric pain. In: McGrath P, Stevens B, Walker S, Zempsky W (Eds) *Oxford textbook of paediatric pain*, pp. 85–93. Oxford, UK: Oxford University Press.
- Roth-Isigkeit A, Thyen U, Stoven H, Schwarzenberger J, Schmucker P 2005 Pain among children and adolescents: Restrictions in daily living and triggering factors. *Pediatrics* 115: e152–162.
- Sandborgh M, Åsenlöf P, Lindberg P, Denison E 2010 Implementing behavioural medicine in physiotherapy treatment. Part II: Adherence to treatment protocol. *Advances in Physiotherapy* 12: 13–23.
- Sandborgh M, Lindberg P, Åsenlöf P, Denison E 2010 Implementing behavioural medicine in physiotherapy treatment. Part I: Clinical trial. *Advances in Physiotherapy* 12: 2–12.
- Schreiber J, Stern P, Marchetti G, Provident I 2009 Strategies to promote evidence-based practice in pediatric physical therapy: A formative evaluation pilot project. *Physical Therapy* 89: 918–933.
- Sherry DD, Wallace CA, Kelley C, Kidder M, Sapp L 1999 Short- and long-term outcomes of children with complex regional pain syndrome type I treated with exercise therapy. *Clinical Journal of Pain* 15: 218–223.
- Siebert RJ, Taylor WJ 2004 Theoretical aspects of goal-setting and motivation in rehabilitation. *Disability and Rehabilitation* 26: 1–8.
- Simons LE, Kaczynski KJ 2012 The Fear Avoidance model of chronic pain: Examination for pediatric application. *Journal of Pain* 13: 827–835.
- Soderlund A, Lindberg P 2001 An integrated physiotherapy/cognitive-behavioural approach to the analysis and treatment of chronic whiplash associated disorders, WAD. *Disability and Rehabilitation* 23: 436–447.
- Stinson JN, Huguet A, McGrath P, Rosenbloom B, Soobiah C, White M, Coburn G 2013 A qualitative review of the psychometric properties and feasibility of electronic headache diaries for children and adults: Where we are and where we need to go. *Pain Research and Management* 18: 142–152.
- Tupper S, Swiggum M, O'Rourke D, Sangster M 2014 Physical therapy interventions for pain in childhood and adolescence. In: McGrath SB, Walker S, Zempsky W (Eds) *Oxford textbook of paediatric pain*, pp. 581–589. Oxford, UK: Oxford University Press.
- Uman LS, Birnie KA, Noel M, Parker JA, Chambers CT, McGrath PJ, Kisely SR 2013 Psychological interventions for needle-related procedural pain and distress in children and adolescents. *Cochrane Database Systematic Review* 10: CD005179.
- Von Baeyer CL 2007 Understanding and managing children's recurrent pain in primary care: A biopsychosocial perspective. *Paediatrics and Child Health* 12: 121–125.
- Walker LS, Garber J, Greene JW 1993 Psychosocial correlates of recurrent childhood pain: A comparison of pediatric patients with recurrent abdominal pain, organic illness, and psychiatric disorders. *Journal of Abnormal Psychology* 102: 248–258.