

Practical physiotherapists' experiences using cognitive behavioural techniques for treating patients with non-specific low back pain

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Preface

During the first six months of this academic year, I had the possibility to work, as intern, in a clinic where the physiotherapists were using cognitive behavioural therapy (CBT) for treating patients. The effectiveness of their way of treating patients made me really interested in this field, which is still a bit blurry within physiotherapy. Furthermore, I realised how much the application of cognitive behavioural therapy was connecting the patients and the physiotherapists in a very enriching relationship. I decided to study the application of this therapy in relation to non-specific Low Back Pain since it is well known to be a physical issue very influenced by psychological issues, which might be treated by CBT. I would like to thank all my supervisors that helped me during the internship and during the thesis, giving me precious advices and tips. Thanks to Robert O'Manhoy which spend six months of his life teaching me how to be a good physiotherapist, passing me the passion for this job. Thanks to Marianne Nieboer for her precious guidance, patience and supervision during the last six months. Thanks to Tjarco Koppenaal which gave me precious feedbacks during the past year and helped me to be more self-critical towards my job. Thanks to all my friends which shared moments with me, helped me and supported me during the past years and hopefully will continue to do it in the future. Finally thanks to my family who inspired me during all my life.

Simone Lorenzo Benini

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Personal Data

Author

Simone Benini

Student Number: 2201774

Function: Student researcher

Phone number: +31649844545

Email: symoben@virgilio.it **or** s.benbenini@student.fontys.nl

Supervisor I

Marianne Nieboer

Email: m.nieboer@fontys.nl

Supervisor II

Tjarco Koppenaar

Email: t.koppenaar@fontys.nl

University

Fontys University of Applied Sciences

Department of Physical Therapy

Phone number: +31877877877

Dominee Theodor Fliednerstraat 2

P.O. Box 347, 5600AH

Eindhoven, Netherlands

Abstract

Background: Low back pain (LBP) is one of the major causes of disability in the world. Non-specific low back pain (NSLBP) accounts for over 90% of all LBP cases. An effective way to treat NSLBP is combining physiotherapy and cognitive behavioural therapy (CBT). Those psychological techniques are not widely used within physiotherapy, although the efficacy is known in literature. Despite the growing amount of researches on efficacy of CBT, there are not enough information on how to practically apply those techniques in NSLBP treatment.

Objective The purpose of this qualitative research is to find out how physiotherapists can practically apply CBT in the treatment of NSLBP patients.

Methods: A qualitative approach based on semi-structured interview was chosen in order to gain an insight into how physiotherapists can apply Cognitive Behavioural Technique (CBT). Physiotherapists were interviewed through video conversation. The conversations were recorded and fully transcribed. Additionally, the data was then analysed using the grounded theory. Finally, a process of open coding and axial coding was used to produce four different themes.

Results: The axial codes were organised in four different themes. The themes were : coach people from focus on pain to happiness, create a deep personal understanding and connection with the patient, enhance motivation for treatment's goals and lifestyle change, more job satisfaction for the physiotherapists. In those themes it was explained how physiotherapists would practically apply CBT treating NSLBP patients.

Conclusion: Physiotherapists explained different ways they apply CBT with NSLBP patients: through the use of the "gratitude exercise", coaching patients to recognise negative self-talk and using mental visualisation and deep questioning. Furthermore, they explained how use of CBT could lead to better job satisfaction.

Keywords: Cognitive behavioural therapy, CBT, non-specific low back pain, physiotherapy

1. Introduction

Low back pain (LBP) is one of the worldwide major causes of disability (1); it is a substantial economic burden on the health care system of western countries and is expected to increase with the aging of the population (2,3). Nowadays, it is estimated that over 70-85% of the western population will experience an episode of low back pain once in their lifetime (4). Physiotherapy is considered in literature as an effective way to address LBP, since it can reduce pain and disability and can help to return to daily life activities, such as work (5).

Low back pain manifests itself through pain and discomfort in the area between the inferior costal margin to the inferior gluteal folds and the pain could spread as well down the leg (6). LBP which does not present a specific cause of the patient's complaints is known in literature as non-specific LBP (NSLBP) (7). According to the Dutch physiotherapy guideline for LBP, the prevalence of NSLBP accounts for 90% of all the LBP cases (8). Furthermore, the Dutch physiotherapy guideline for NSLBP, following the latest scientific evidences, groups patients into three main profiles: 1) NSLBP with normal course of recovery; 2) NSLBP with abnormal course of recovery but without any psychosocial factors retarding recovery; and 3) NSLBP with abnormal course of recovery and with psychosocial factors impeding recovery (8). The management of the patient's profile 3 should include special attention to psychosocial elements which hampers recovery (8).

Elements that negatively influence recovery in patient's Profile 3 are factors such as psychological distress, anxiety, somatization and depression. These factors increase pain perception and disability in NSLBP (8,9). Psychological factors, such as the ones previously mentioned, can cause negative thoughts, leading to an arousal in the autonomic nervous system. A prolonged activation of this system increases the release of cortisol, hormone linked to enhanced pain perception (10,11). Furthermore, psychological factors can change the neuroplasticity of the brain, creating a stronger pathway between the source of the pain and the brain, leading to a lower pain threshold in NSLBP patients (12,13). Psychological elements can, in fact, lead to negative outcomes in NSLBP patients (14,15): such as an increase in pain perception and decreased self-efficacy (16–19). Low level of self-efficacy is known in literature to enhance pain perception in patients with NSLBP. This can lead to an increase of movement avoidance behaviours, which are known to enhance pain and disability, causing a decrease in treatment's outcomes in those patients (8,20) (Appendix 1). Furthermore, patient's non-adherence to the treatment, which is also influenced by psychosocial factors (21), may decrease the efficacy of physiotherapist's advices. This can have a negative impact on the recovery of NSLBP patients (22).

An effective way to influence psychosocial factors, within physiotherapy, is the use of cognitive behavioural techniques (CBT) which are found to be effective in treating NSLBP patients (23). CBT is an umbrella term for indicating different psychological approaches, which in general have in common the ability to effectively treat psychosocial issues, such as distress and anxiety, which hamper recovery in NSLBP patients (8,11,24). Furthermore, CBT can influence pain perception, adherence to the treatment and patient's self-efficacy, which are elements that can influence NSLBP treatment's outcomes (2,16,25,26).

The theoretical base from where CBT works is that thoughts, which might be cognitive distortions of reality, create a physiological response within the human body, often including adrenalin and cortisol (11). This physiological response could create physical tension and a sense of alertness, which can alter the perception of pain in NSLBP patients (11). CBT are studied to be effective in creating awareness towards cognitive distortions and therefore to reduce the release of hormones linked to enhanced pain perception (11). In physiotherapy literature, CBT is proven to be effective in treating NSLBP (23).

Despite the growing amount of research regarding the efficacy CBT used for treating NSLBP (23,27–29). In a recent study by van Wilgen et al. (30), it was highlighted that most of the physiotherapists (PTs) still focus on the biomedical model for treating patients with NSLBP. Moreover, in another study, is stated that physiotherapists don't feel confident enough to effectively address the multidimensional aspects of NSLBP, including psychosocial factors (31).

Nowadays, there is not enough data regarding how to practically apply CBT in physiotherapy. At the most, there is a list of techniques lacking information. In fact, there is insufficient practical and clear knowledge on how to apply those techniques (25,32). However, physiotherapists can be trained, through specific seminars, to use CBT. This training provides tools for reducing pain and increasing self-efficacy for patients with NSLBP and tools for enhancing patients' adherence to the treatment (2,16,25,26). Physiotherapists working at Happy Physio (HP) clinic are an example of such specific trained practitioners. Happy Physio is an Australian clinic located in Perth, which adopts CBT for treating NSLBP. The clinic seems to be very successful (33). All physiotherapists working there were trained through an 8 months course, consisting of two hours a week of workshop with a CBT mentor and 4 hours of self-study, to practically apply CBT in treatment.

Since CBT seems to be promising in the field of NSLBP and since its early and extensive use in treating and limiting occurrence of NSLBP is needed (11), there is a need to provide more practical information on how to apply those techniques within physiotherapy (32). For this reason, the aim of this study is to investigate the use of CBT as applied by the physiotherapists at HP in the treatment of NSLBP.

2. Methods

2.1 Research design

A qualitative research based on semi-structured interviews was used in this study to get an insight on how the physiotherapists involved, experienced and used CBT for treating NSLBP patients (34). A qualitative approach was chosen for getting a deeper understanding of the points of view of the physiotherapists regarding the practical application of CBT (35). Moreover, qualitative study is designed for providing a better understanding of the phenomenon holistically and in its context (34), which helped in having a clearer practical view on the physiotherapists' choices within the techniques to apply with NSLBP patients. The strategy for the research used was the grounded theory, which would allowed this research to investigate into the meaning of techniques applied by physiotherapists and to investigate better what CBT techniques were used and why (36).

2.2 Participants

Practitioners meeting the inclusion criteria in this study were physiotherapists working at Happy Physio practice in Perth, Australia. Physiotherapists working at HP were working in three different clinics, all belonging to the same company. Further inclusion criteria was having successfully completed an eight months course, consisting of two hours of workshop/lecture every week and four self-study hours at home, about use of CBT in treatment. Additional inclusion criteria was using CBT within NSLBP treatments.

Firstly the owner of the HP clinic was contacted through email and the permission to ask physiotherapists working in the clinic was agreed. Then all the email addresses of the physiotherapists which met the inclusion criteria were collected from the owner of the clinic. All the participants were firstly approached with an information letter sent on personal email (Appendix III), then an appointment for the interview was scheduled with all the physiotherapists willing to take part on the project, which were eight out of nine. All the interviews were made by using video conversation, Skype contacts were collected from the physiotherapists.

2.3 Data collection

A semi-structured method of interview with a schematic organisation of questions was used to explore the topics (37).

This means that open questions were asked to the participants for guaranteeing to the answers to be less conditioned as possible (38). A semi-structured interview with sub-questions was used for letting the participants have freedom regarding how to answer the questions, based on what they thought was important

to say (39). During the interviews, semi-structured interview method was used. Common topics covered in the interviews are listed in the Appendix II.

Prior to the video interviews, the information letter was read to the physiotherapists and after that the participants were asked to agree to the consent form (appendix III) and proceed with the questions, to record the interview and to use the provided information for a public study purpose. Seven physiotherapists out of eight were interviewed using Skype (Skype software S.A.R.L. , Microsoft corporation), with the remaining one Facebook video-conversation was used. The interviews were recorded using a professional recorder. The interviewer did anticipate on the time difference which is 6 hours between the Netherlands and Western Australia. All the interviews were conducted one physiotherapist per time, with no other participants in the room. All interviews were conducted in English. Each interview lasted from 30 to 40 minutes. Interviews were conducted between 2th of May and 30th of May 2016. The topics of the interview schedule are outlined in Table 1.

Table 1 topic interviews

Four main topics are present in the interview schedule.

List of topics	Use of CBT for influencing pain
	Use of CBT for influencing treatment adherence
	Use of CBT for influencing self-efficacy
	Experiences of the physiotherapists before and after the course about the application of CBT

Interview schedule can be find in Appendix II

2.4 Data analysis

All the interviews were fully transcribed by the author of the study. When no new relevant information was gathered from the physiotherapists interviewed, data saturation was reached. On the base of the transcripts, data analysis took place.

Through repetitive reading of the transcripts and based on the research question and its relevance, the data was divided in fragments. All the fragments were equipped with a code, as close as possible to the text and which summarized the fragment. These codes are called open codes (40).

The open codes were structured and organised in groups. These groups consisted of open codes that join together synonyms and labels which are equal. These groups received a new code name that covers the cargo of the group open codes. This process is called the axial coding process (40). The next step of data analysis consisted in joining labels of axial coding which belonged to the same meaning category (41). Finally, all the axial codes were organised in themes which were used for the results, discussion and conclusion part of the thesis. The entire process of coding of all the four themes can be found in Appendix IV.

2.5 Ethics

Physiotherapists were informed prior to the interview on the conditions to participate. Physiotherapists were asked to sign a consent form prior to the interview. All the interviews recorded were deleted after the transcribing process. All the data gathered is not linked to any name, physiotherapists were indicated with an acronym (P1; P2; P3...). Data, then, were reported anonymously, and there were no connection with names.

3.0 Results

In this part of the research, personal details of the physiotherapists who participated in this study are listed. Furthermore, an insight, on how physiotherapists apply CBT in NSLBP and what their experiences are, is given in four different themes. The themes are: coach people from focus on pain to happiness, enhance motivation for treatment goals, create a deep personal understanding and connection with the patient, more job satisfaction for the physiotherapists.

3.1 Participants

The PTs meeting the inclusion criteria were nine. One of the physiotherapists included did not give his consent to be interviewed. The rest of the PTs, which were eight, agreed to take part in the study. The CBT used by the interviewed physiotherapists is similar within the physiotherapists group. The physiotherapists' age and experience using CBT is different between the participants. Range of age of the participants is between 23 and 31 years old. Experience the participants have in physiotherapy is included between 2 and 8 years. The experience of physiotherapists included in the study, using CBT, is varying between 1 year and 5 years. All the details are also listed in table 2.

Table 2 Details of the physiotherapists

Physiotherapist	Age	Experience with physio	Experience with CBT	Sex
P1	31	6 years	3 years	M
P2	24	3 years	1 year	M
P3	27	5 years	2 years	M
P4	26	5 years	2 years	M
P5	29	8 years	5 years	F
P6	23	2 years	1 year	F
P7	31	6 years	5 years	M
P8	27	6 years	1.5 years	F

3.2 Coach people from focus on pain to happiness

The coaching techniques physiotherapists apply are oriented to shift the patients' focus from NSLBP to positive things patients have in their life.

Most of the physiotherapists mentioned the importance of teaching to the patients how they could use cognitive tools to shift their focus from pain and lower back to best things in their lives. A good example of how the physiotherapists guide the patients in this process is given from one of the physiotherapists: *"I often give them a bit of homework so write down the top 21 things on a sheet of paper that they are truly grateful for, I ask them to divide those 21 things in 7 papers and then they have to put those sheet next to their bed and every morning straight up they wake up from their bed, instead of focusing towards their back they straight away shifting their focus on something positive by looking at their top three gratitude list."* (P4).

According to the physiotherapist, this exercise is designed to stimulate positive mindset and positive thinking. In other words shifting the focus of the patient from something unpleasant such as back pain to something positive in his own life.

Physiotherapists mentioned the importance of the patients' use of language used for describing their back, which, according to them, can alter the individual perception of pain. PTs try to teach patient to recognize negative self-talking and change it: *"I make them notice in conversation when they use negative words towards themselves and we try to change that."* (P7).

Furthermore, physiotherapists want their patients not to focus on pain. A way they try to shift the patients' focus is not referring to pain or low back too much during the examination and treatment. *"Try to completely avoid any questions on pain, because it will force them to focus on that."* (P3). *"If you just ask them to pick up a pen on the ground, they probably will not have as high pain scores."* (P1).

According to the PTs, asking "where does it hurt when you touch your toes?" will put the focus on pain, asking "can you touch your toes?" will put the focus on the movements. PTs explained that using the latter way to ask to perform a movement could lead to focusing less on the painful area and so could reduce the degree of pain perceived by the patient. In fact, words used to give instruction to the patients can have an influence on the patient's perception of pain.

Other techniques PTs mentioned are based on teaching patients to influence pain perception through use of "power poses". Power poses are stances associated with confidence, power and achievement, such as chest lifted, head held high, arms up or propped on the hips. Those stances, according to the PTs, can influence the release of hormones, such as cortisol, which can alter the individual perception of pain. They also teach the patients to create a "mantra", combined with the power poses, to repeat to themselves during periods when they feel overwhelmed by pain or by emotions. *"We made something like a wonder woman pose and her mantra was "I am wonder woman" so whenever she feels that things are getting on top of her and whenever she feels that she is about to start crying uncontrollably, she would take few deep breath, and say to herself "I am wonder woman, I am wonder woman..", just breath it in and standing in a good power posture"* (P8).

3.3 Enhance motivation for treatment goals

In this theme an insight on how physiotherapists use CBT to get patients motivated and to keep that motivation up towards treatment's goals is given.

Physiotherapists highlighted the importance of using a meaningful goal setting with the patients. According to them, the goal setting phase should start with questioning deeply the patients to know what they value most, and to know what the most important things in their lives are. Deep questioning, is aimed, despite getting connected to patients, to guide the patient to realise what is the real deep reason why they want to get rid of their pain. Use that motivation to achieving end goals, which is not based on pain but it is about meaningful activities in patient's life. *"Find out what they value, generally you can just ask the question: what are the most important three things in your life today, find out what that patient is about, and then use that, make them feel that it belongs to them and keep focus on that particular thing working toward the end goal... You find that why, just digging deeper and deeper with questions"* (P6). For example, a grandmother which has pain in her knee, might find, through deep questioning, that her real motivation is getting better for going on holiday before she becomes too old for it. According to the PTs, using the holiday as motivating factor is keeping the patient highly motivated toward the end goal, which would be different in case of using pain as motivating factor.

According to the PTs, within goal setting it is important to give, periodically, positive reinforcements to the patients, this will keep patient's motivated to work towards their goals. They explained that positive reinforcements are effective in keeping the patient interested in the treatment plan and motivate to work towards his goal. For giving positive reinforcement is important to get objective assessments from the physical condition of the patient, such as video record of movements, to show to the patient the positive improvements he made. Movements which might be taken as reference points are, for example: picking up a pen from the floor, or sport movement such as pitching or kicking. Those can be recorded before and after a certain period of time, to show the improvements to the patient. Positive reinforcement is a powerful tool for keeping motivation ongoing towards the process of change. *"I make sure I reassessing the patient every four to six weeks, so re-catching him, showing him video or questionnaires are quite good for reinforcing what he is doing: so video him while, for example, doing a single leg squat, on day one and then show him the video after 30 days can be quite powerful."* (P1).

Another way to enhance motivation, according to the PTs, is the use of so-called "mental visualisation". It is a motivational technique which consist in making patients imagine how the future could be if they would make some changes in their life, or either how would it be if they will not change their behaviours. The physiotherapists experienced this as a powerful way to enhance patients' motivation toward the end goal. *"Take the picture of where they could end up if they keep doing the same thing and bring that to them, make it reality, how would you feel if you end up in hospital and you will be not able to move in 5 years time, you family members you miss out... if they get motivated more to reach pleasure, you have to focus more on what life could be like if they could reach their end goal, so usually you do a bit of a combination of both"* (P1).

PTs help patients to realise that the choices they make in their lives are influencing the achievement of the treatment's goal. Physiotherapists used to show to the patients results that other people, which were in a similar situation as them, achieved. It helps, according to the PTs, to motivate the patients that if they follow the treatment, they can achieve their goal as well. *"As soon as you link how their life is like today in terms of some of the behaviours they have had, you can empower them through that linkage to connect cause and consequences."* (P2). *"I give them examples of other people that changed their LBP situation"* (P6).

3.4 Create a deep personal understanding and connection with the patient.

The creation of a deep connection between patient and PT gives, according to the latter, multiple positive effect on the treatment. It is important since patients will listen more carefully to the PTs' advices and they will be more adherent to the treatment plans. Furthermore, connection and understanding between practitioners and patients make, according to the PTs, application of CBT easier and more efficient. PTs experienced that patients, in fact, are more willing to adopt new behaviours and rely more on the practitioner's advices if there is connection between them.

Subjective open deep questioning is a tool physiotherapists use for creating connection and getting an understanding of the patient not just under physical point of view, but in a holistic way: what he likes to do, what he eats, who are his friends, his favourite moments and emotions. It is possible to use those information to get more connection between the physiotherapist and the patients. *"In my initial consultation when I first see someone I don't usually go straight away and ask about their pain or their injury or their issue why they come in, so I generally say we will get to that in a minute but firstly I would like to know you a bit better so that I have a bit of a background. So I generally finding out what their typical week is like, what their living situation is like, I notice when they smile talking about something and how much time they spend chatting about a certain topic."* (P5).

Mirroring the patient's body language is a technique that PTs interviewed use for creating connection with the patient. This technique consist in replicating the way the patients behave, talk and move to create more connection and to make them feel more in their comfort zone. *"Also trying to mirror them a bit, everyone comes in with a different body language, so if you sit there with someone slumped down a bit shy then you are not going to be really out there and in their face cause they are not going to appreciate that really much, if someone is a bit more loud and jokes around a bit more, then you can get along with that kind of thing, so you sort of mirroring their body language and their personality"* (P8).

Show care to patients by being absolutely present during the sessions, asking about personal life events and remembering personal things are powerful ways to get a deeper understanding of the patients and to create a stronger connection with them. *"First step is that you need to be 100% present with the client and should create connection you should genuinely care about the other person if you want to get good results. Is also important to do little things such as remembering the wife's name or kids' name"* (P7).

3.5 More job satisfaction for the physiotherapists

This theme focus on how the physiotherapists experienced CBT in the context of their job satisfaction. The physiotherapists reported to be much more satisfied since they learned how to use CBT. A relevant element which made physiotherapists more satisfied about their job was the strong connection they were able to create with their patients, through the use of CBT. This stronger bond with patients makes the work of the physiotherapists more enjoyable and more enriching for them. *“You develop a greater connection with them you get to know them and you have that report and social connection. You get more personally from your sessions because you do have a well-developed bond with them, so work is overall more enjoyable” (P3)*

Physiotherapists find CBT to be more effective in long-term results and therefore more effective on changing patients' lives. This was considered rewarding from most of them since they feel they have more influence on many aspects of patients' lives. *“For me to see I have a positive impact on someone's life is quite rewarding” (P5)*. Comparing with previous physiotherapy experiences they had, which were for all of them more based on a physical approach to NSLBP, they reported to be more satisfied with their work now since they know they can impact people's lives better. *“You can completely change someone's life using those techniques and that is something that is really rewarding for myself.” (P4)*

Physiotherapist explained how they apply CBT techniques and how they manage to be effective and not more time consuming than with a biomedical physiotherapy approach. What they reported was the importance of time management using CBT while treating patients as it would be a normal chat between physiotherapist and patient. *“I chat with them while we are doing exercises, I have sorts of discussions with them, about their goals, about their beliefs of their pain, about what they think is going to help them getting better and then I start to educate them...in between exercises I spend a minute or so having a bit of chat and bring up the topic again, giving them the chance to reply to me...in the treatment session I have a mix between specific exercises and cognitive behavioural techniques.” (P1)*

4. Discussion

The aim of this qualitative study is to give a clearer insight into the practical application of CBT within the physiotherapeutic treatment on NSLBP.

Coaching NSLBP patients to shift the focus from pain to positive thinking is one of the most common technique explained by the interviewed physiotherapists. The practitioners working at HP explained a practical exercise they use to get patient's positive thinking started; one way would be to teach NSLBP patients the "gratitude exercise". Gratitude exercise consists of a home-exercise program to promote positive thinking. The patient is told to write down every day, first thing in the morning, three positive items/moments he is grateful for. This enables a shift away from pain towards a positive attitude. This approach could enhance happiness in NSLBP patients whom are known to be prone to anxiety, distress and depression (9,42)(43). Furthermore, positive thinking is an effective way to enhance patient's quality of life which might have been decreased by LBP (44,45). The "gratitude exercise" is a technique applied, as well, in other fields such as positive psychology, and is known for improving patient's psychological well-being (43,46). They are, in fact, asked to write down the best three things that happened in their lives (43,47). This process is aimed to lead patients to focus on positive aspects of their lives, promoting positive thinking (43). Positive thinking is an element that has not been remarkably included in physiotherapy literature such as Dutch guideline for NSLBP (8). Including this element could lead to a better outcome in treating psychosocial issues, which triggers the patient's back pain. Some of the NSLBP patients, though, might not adhere to the exercise given by the physiotherapists (48). The reason for the low adherence might be the patients' disbelief in the positive effects of the exercises, failing to implement a regular training program or possible denial of the "psychological" help from a physiotherapist. Furthermore, some patients might have difficulty to come up with good things which happened to them, where others might find difficult to keep up, everyday, with the "gratitude exercise" task (43).

Techniques, such as the gratitude exercise, which attempt to shift the focus from pain to positive thinking could be added to guidelines for NSLBP. Moreover, those interventions could be taught to physiotherapists through specific seminars on CBT in order to achieve better results with these patients.

Another important aspect mentioned is the patients' use of language, which can influence their individual hormonal release. Indeed, using words recalling pain, for describing his own back, can influence the release of cortisol, which can enhance NSLBP (49,50). The interventions the PTs use are based on teaching patients to avoid negative self-talk words such as: "terrible" or "broken" used to describe their own back. Additionally, physiotherapists train their patients to self-recognize a negative use of the language toward their back. Identifying negative self-talk is a skill that the NSLBP patient needs to develop, since it is an important tool for self-moderating his own pain (49–51). On the counter side, the way physiotherapists apply this technique might not be as effective as the use psychologists do. In psychology, in fact, patients are asked to keep a diary and self-report negative self-talk, or to develop thought-stopping strategies, whom might be more effective than just trying to avoid the use of negative words (52,53). Recognising negative self-talk could lead to a more effective prevention of NSLBP. Indeed, by becoming aware of the use these words, the patient would be able to recognize specific patterns, which could lead to development of NSLBP. Up to now, the importance of the

use of language is not mentioned in recent NSLBP guideline (8), on the other hand, it is known from physiotherapy literature as a tool to influence pain perception (49,50). This technique is, according to the PTs interviewed in this study, easily applicable within physiotherapy and it has a big impact on the patient's perception of his issue.

Other techniques mentioned are: asking patients to imagine how the future would seem once they would have achieved their goals. Questions such as "How would you feel if you could play again with your grandkids in three month time?" or "How would you feel if you could join back your friends for the Sunday bike ride?" are asked based on the individual history of the person. Patients would answer and the physiotherapists would then ask what made them feel in that way and why. The practitioners at HP aim at asking deeper questions until the patient realizes, on his own, how important it is for him to return to normal ADL activities. Physiotherapists adopt mental images and intrinsic motivations to encourage the patients to follow the treatment. The techniques applied are similar to those used in Motivational interviewing (M.I.) (54), which are psychological techniques adopted as well within the physiotherapy field (55). When applying motivational interviewing, the practitioner listens to clients from non-judgmental point of view. Moreover, open and deep questions are asked in order to find patient's intrinsic motivations to achieve his goals (54). This approach, in physiotherapy, might find resistance within some patients which might not be willing to open up towards the physiotherapists. Some patients could also be reluctant to try CBT techniques and answer the PT's questions (56). The CBT techniques were not always used in a private space by the PTs. The use of psychological techniques in a shared space with other people could hamper the communication between PT and patient and therefore negatively affect the effect of those technique (61,62).

The use of this motivational technique is not present in the Dutch physiotherapy guideline for NSLBP(8), but it is included, as a treatment method, in other physiotherapy literature about NSLBP (2). The Dutch guideline is suggesting a multidisciplinary treatment, where a psychologist, involved also in the treatment of the NSLBP patient, could probably apply those motivational interventions (8). The opinion of the author of this study is that, within a multidisciplinary intervention, physiotherapists should be also able to apply M.I. techniques to the treatment of NSLBP. Use of M.I. techniques could lead to greater motivation to follow the treatment for the patients and more satisfaction for the physiotherapists, since patients would be more motivated to work towards the end goal of the treatment (57,58).

In this study, physiotherapists also talked about satisfaction towards their job, which according to them, substantially increased with the use of CBT versus a more traditional approach to physiotherapy, which the participants experimented in the past. The way physiotherapists reached this level of enjoyment, is based on the different approaches they used with patients after the course, compared to before. Factors which influence work satisfaction are asking deep open questions to the patient which leads to closer link between PT and patient and can create increased understanding for the PT of their patients. Additionally, this deeper knowledge of the patients for the PT created a stronger link between care given and emotional involvement. Furthermore, thanks to the use of CBT physiotherapists feel more effective in changing patients' lives. The beliefs an individual has about his job can influence how the job is done and how much the person is satisfied by it (59). Believing the possibility to change people's life, through physiotherapy, makes PTs' job more meaningful, and

enhances the PT's job satisfaction, compared to having lower expectations (60). The PTs reported to be able to address the psychosocial part and the anatomical part of the NSLBP within a normal physiotherapy time session of half hour. In fact, one of the limiting factor in the use of CBT, in physiotherapy, is related to lack of time within the physiotherapy session (56). Practitioners apply CBT while talking with patients, instead having a normal conversation they were targeting specific behaviours or beliefs to change. However, the way physiotherapists apply those techniques, as a normal chat, could lower the degree of importance the patient gives to the conversation.

This study adds suggestions based on experiences, about how to enhance work satisfaction within NSLBP physiotherapy treatment. Finally, the satisfaction at work can enhance individual job performance, can make the business grow and can motivate the practitioner to train further in their fields (63).

A strength of this study is that although the physiotherapists interviewed were just eight, after the fifth interview, with the use of an iterative process, no new information were collected. This allowed the researcher to have a clear picture on the topic. Another strength of the research was the possibility the physiotherapists had to express themselves freely since open questions were asked.

Limitations of this study is that the interviews and the analysis of the data has been done individually just from one researcher (34). This means that "triangulation" with different researchers checking the data was missing (34). This led to impossibility to confront ideas and interpretations of results. Confronting, in fact, could improve the quality of the data collection and analysis of the data (34). The researcher worked in the same clinic where the interviewed physiotherapists were working and this made the vision of the researcher not as free from judgments and preconceptions as preferred. Furthermore, the experiences of the physiotherapists interviewed working with CBT and with physiotherapy were different in terms of time. Another remarkable limitation is that the results are based on what PTs said and the point of view of the NSLBP patients is not taken in consideration.

Future research should focus on asking a greater number of physiotherapists, coming from different practical experiences, how they apply CBT in NSLBP treatment. This could lead to a practical guideline about use of CBT in physiotherapy which could be implemented in existing NSLBP guidelines. Another recommendation for the future is to implement those practical CBT techniques into physiotherapists' training for treating NSLBP.

5.0 Conclusion

This study gives an insight into how physiotherapists, trained in applying CBT, use those techniques in the treatment of NSLBP patients. One remarkable way to apply CBT is by using the “gratitude exercise which helps the patient to switching off the negative thoughts and promoting positive thinking. PTs apply CBT also by coaching patients to notice when they use negative self-talk towards their back. Furthermore, PTs explained how they use CBT to create mental visualisations to motivate patients towards the therapy. Another way they motivate patients, is by asking deep open questions to help them finding intrinsic motivations for the achievement of their treatment’s end goals. In conclusion, physiotherapists explained how the use of CBT can enhance their job satisfaction. Those suggestions might be used in the future to create a CBT guideline to complete the existing NSLBP guidelines.

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APPENDIX I CBT

CBT

CBT are designed to teach patients to recognize general negative thoughts, which are thoughts that lead to an abnormal release of cortisol and then to a decreased pain threshold (11,17). Moreover, CBT are designed to modify attitudes and beliefs about pain, through providing information, and assisting in reasoning and scheduling exercise programmes (11).

PAIN PERCEPTION

Beliefs are well known to influence pain perception and disability in patients with LBP. Literature show that patients with LBP which followed a management programme which made use of CBT targeting beliefs about pain, reported an improvement in terms of limitation and pain perception (64). There is evidence in literature that pain-related fears can change the neuroplasticity of the brain, creating a stronger pathways between the source of the pain and the brain, leading to a lower pain threshold (12,65)

Thoughts can create a physiological response in the body, negative thoughts, which often are created by a cognitive distortion of reality, can increase the release of cortisol, the hormone involved in pain perception. CBT are designed to teach patients to recognize general negative thoughts, which are thoughts that lead to an abnormal release of cortisol and then to a decreased pain threshold (11,17). Moreover, CBT are designed to modify attitudes and beliefs about pain, through providing information, and assisting in reasoning and scheduling exercise programmes (66).

ADHERENCE TO THE TREATMENT

Adherence is defined as the extent to which the patients follow physiotherapist's advices (67).

Literature studies show that CBT that target communication between patient and physiotherapist can positively influence patient's adherence to treatment. Furthermore, shared decision making between patient and therapist lead to a better adherence (68,69).

CBTs address goal settings, an effective goal setting, negotiated between the patient and the practitioner, can have a positive effect on patient's adherence to the treatment (2).

SELF-EFFICACY

Education is a crucial part of self-efficacy. Education tend to increase self –efficacy. Self-efficacy is not a personality feature, is a trait that can be modified. Self-efficacy is a belief on ourselves that the implementation of a specific new behaviour is possible (70,71). Furthermore, the use of CBTs for establish a good patient-physiotherapist relationship can influence patient's self-efficacy positively (71,72).

APPENDIX II Interview Schedule

Main question	Sub-questions
How do you manage to decrease pain perception in patients with non-specific-LBP?	Believes Pain avoidance Functional rewiring process Neuroplasticity
How do you enhance adherence to the treatment for patients with non-specific-LBP?	Communication Goals setting
How do you practically help your patients to increase their self-efficacy?	Education Physiotherapy-patient relationship
What are the experiences of physiotherapists working with CBT, compared to before the course?	Time consuming Satisfaction at work

APPENDIX III Information letter

Dear Sir/Madame

I am a fourth-year student of physical therapy at Fontys Paramedic Hogeschool, Eindhoven. I would like to invite you to participate in my research project which will investigate, through interview, the practical experience of physiotherapists working with cognitive behavioural techniques in LBP patients. Before taking a definitive decision I suggest you to read carefully the information sheet provided, in order to have a clearer idea about the interview.

Goal of the research

The impact that the use of psychosocial techniques, such as cognitive behavioural techniques, have in physiotherapy is well known to be positive. The latest literature is highlighting how important is that physiotherapists are trained for being prepared to deal with psychosocial elements treating NSLBP patients. Although this urgency in literature, there are not enough articles explaining the practical applications of those therapies in treatment.

The goal of the research is to shed some light on the practical application of those techniques within treatment of NSLBP patients.

Eligibility for the experiment

- Being physiotherapist using cognitive behavioural techniques.
- Have passed the internal exam about the use of CBT.
- Working in one of the HP clinic in Perth, Australia.

Interview procedure

The interview is semi-structured and consist of four main open questions about the practical use of CBT to enhance certain LBP treatment's outcomes. Within those questions, two sub-questions for each theme will be asked. The all interview procedure will take approximately half an hour. Prior to the interview, the inform consent should be signed. The entire interview will be recorded.

Ethics

All the interviewed recorded will be cancelled after the transcription. All the information gathered will be not linked to any name, physiotherapists will be indicated with an acronym (P1; P2; P3...). Data then will be reported anonymously, and there will not be any connection with names. Physiotherapists will be informed prior to the interview on the conditions to participate. Physiotherapists will be asked to sign a consent form prior to the interview.

Certificate of consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant _____

Signature of Participant _____

Date _____ **Day/month/year of Consent**

APPENDIX IV Coding procedure

Theme 3.2

Theme	Categories	Quotes
Coach people from focus on pain to happiness	Shift focus from pain to good things	<p>Make her do gratitude diary for shifting the focus on good things. P8</p> <p>Cut focus on pain and think about something positive. P6</p> <p>Change her point of view through gratitude exercise and Make her look at the past differently. P7</p> <p>Make patient write a gratitude list to shift focus. P4</p> <p>Make patient write gratitude exercise to functionally rewire the brain. P5</p> <p>Get them to write down things they like and try to incorporate in daily life. P3</p> <p>Focus on things which are not pain. P1</p>
	Language and focus	<p>Avoid questions about pain. P3</p> <p>Language used influence pain perception. P4</p> <p>Avoid terms which can recall pain and focus on the area, while asking for a movement. P1</p> <p>Language used can change the meaning, focus and physiology. P7</p>
	Posture change to influence pain	<p>Use power poses for control emotional state. P8</p> <p>Make them do postural exercises when under stress. P5</p> <p>Make patients do power poses to feel more positive. P2</p> <p>Make patient experience power poses efficacy and implement it in treatment. P1</p>

Theme 3.3

Theme	Categories	Quotes
Enhance motivation for treatment goals	meaningful goal setting	<p>Dig deep on questions to find the real motivation. P4</p> <p>Find an emotion that can motivate them. P1</p> <p>Find out what people value for creating motivation and emotional connection to goals. P7</p>

Deep questioning for finding real motivation for them P8

Don't use just pain as motivation. P5

Questioning why they want to get better P3

Create a strong connection between emotions and goal and find a reason why

Positive reinforcements

Have measurable sub-goals for keeping motivation up. P4

Keep reference point of improvements. P8

Make patients feel shocked about the improvements video recording movement, and showing after 6 weeks. P6

Record with a camera the improvements. P3

Track progress by video or photos for motivation. P2

Reassess condition from the first session till now. P5

Give patient evidences of his improvements. P1

Mental visualisation

Use positive imagery, focus on what life could be. P1

Picture the patients how could be if their problem will become bigger and they don't do anything about it. P7

Ask patient how he would feel if will not be able to do That in the future. P3

Picture how they would look like if they could reach the goal. P2

Bring present forward and picture a possible future. P4

Positive examples

Show them examples of others which made changes for increasing motivation. P6

link consequences to their behaviours to create motivation to change. P2

Show them what other patients in the same situation achieved. P3

Make patient realise that future is a choice and results of behaviour he has. P4

Theme 3.4

Theme

Categories

Quotes

Create a deep personal understanding and connection with the patient

Subjective questioning

Don't ask about the pain immediately, but get and understanding of the patient's life. P7

Discuss their lives with them and understand them as a whole person. P5

Don't just ask about the pain but get a better understand of the patient. P6

Be very sensible and subjective questioning P2

Ask them what they value most in their lives. P1

Mirroring body language

use mirroring techniques for creating more connection. P4

Adapt to the patient's non-verbal communication. P1

Build report through mirroring the patient's body language. P2

Mirror patient's body language for creating connection. P8

Imitate patients' body language to make them feel more comfortable. P5

Connect by imitating body language. P3

Mirror the patient to create connection. P2

Show care to patients

Be 100% present to create connection and show genuine care by remembering personal things. P7

Show how much you care remembering personal things about their lives and ask back things. P5

Listen carefully to your patient as a family member, remember personal details, to show care. P1

Call patients to show genuine care, ask them things they talked with you about. P8

Write down patient's personal information to remember. P6

Theme 3.5

Themes

Categories

Quotes

More job satisfaction for the physiotherapists	Human connection	<p>Enjoy more work because of connections with patients. P3</p> <p>Using CBT I like more my job because I create more connection with patients. P5</p> <p>more rewarding because you get a strong connection.P8</p> <p>With CBT more satisfaction because I get to know well my patients. P7</p>
	Bigger impact on people's life	<p>CBT is much more effective to impact people's lives. P7</p> <p>Being able to change someone's life is really nice. P1</p> <p>Knowing you had an impact on them is very rewarding. P5</p> <p>CBT much more rewarding because you have a greater Impact on patient's life. P4</p> <p>CBT more rewarding because you know you had an Impact on people's life. P8</p> <p>Getting better with clients since I use CBT, enjoy more my Job. P6</p>
	No time consuming	<p>CBT are like chatting but you give a direction to the Conversation. P1</p> <p>CBT doesn't take more time,chat while doing treatment. P8</p> <p>CBT not more time consuming than biomedical treatment. P6</p> <p>Use CBT while doing other exercises, during the therapy. P5</p>
	Positive examples	<p>Show them examples of others which made changes for increasing motivation. P6</p> <p>link consequences to their behaviours to create motivation to change. P2</p> <p>Show them what other patients in the same situation achieved. P3</p> <p>Make patient realise that future is a choice and results of behaviour he has. P4</p>