The effect of a self-determination theory-based communication skills training program (CONNECT) on physiotherapists' clinical practice: A randomized controlled trial with chronic low back pain patients

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51 **Clinical Trials Registration Number:** ISRCTN63723433
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Abstract

Objective: CONNECT is a communication skills training program, grounded in self-determination theory, designed to enhance physiotherapists' support of their patients' psychological needs. The purpose of this study was to examine intervention effects on physiotherapists' supportive behavior during clinical practice.

Design: Randomized trial.

Setting: Hospital outpatient physiotherapy clinics in Dublin, Ireland.

Participants: 24 physiotherapists and 24 patients with chronic low back pain.

Interventions: 2 hospital clinics were randomly assigned to the intervention arm. Physiotherapists (n = 12) received 8 hours of communication skills training focused on supporting patients' psychological needs. Physiotherapists (n = 12) from 2 other hospital clinics formed a waitlist control arm.

Main Outcome Measures: Verbal communication between each physiotherapist and a patient was audio recorded and independent, blinded raters used the the Health Care Climate Questionnaire (HCCQ) to assess physiotherapists' needs support behavior (primary outcome).

Results: Independent raters' HCCQ scores favored the intervention arm ($p < .01$, Cohen's $d = 2.27$).

Conclusions: Compared with controls, independent ratings demonstrated that physiotherapists who completed CONNECT provided greater support for patients' needs. Long-term maintenance of this supportive behavior should be examined.

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79 **Key words:** communication; physical therapists; patient compliance; motivation; fidelity

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81 **List of abbreviations:**

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83 HCCQ: Health Care Climate Questionnaire

84 HCP: Health Care Practitioner

85 SDT: Self-Determination Theory

86 CLBP: Chronc Low Back Pain

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The CONNECT trial [1] involves evaluation of a communication skills training program, grounded in self-determination theory (SDT) [2], designed to enhance physiotherapists' support of their patients' psychological needs. The purpose of the current study was to examine intervention effects on physiotherapists' supportive behavior during clinical practice (i.e., intervention fidelity). Examination of intervention fidelity is an important important component of effectiveness trials and knowledge translation into clinical practice [3], but until recently has received limited empirical attention [4, 5].

According to SDT [2], people have basic psychological needs for autonomy (feeling fully volitional or free to engage in an activity), competence (feeling effective and capable) and relatedness (feeling connected to and cared for by others). When a patient's psychological needs are supported, participation in treatment is likely to be more self-determined, meaning that it is driven by valued benefits and a willingness to participate, and long-term adherence is more likely than when a paternalistic model of care is adopted [6]. Unfortunately, there is evidence that health care practitioners (HCPs) often adopt this latter model of patient care [7, 8].

SDT-based healthcare interventions are designed to teach HCPs the skills needed to support patients' psychological needs, thereby promoting self-determined motivation and engagement in health-promoting behavior. Empirical support for these relationships has been demonstrated in a recent meta-analysis [6]. Drawing on this evidence, a communication skills training intervention, entitled CONNECT, was designed for physiotherapists working with individuals seeking treatment for chronic low back pain (CLBP). Specifically,

physiotherapists were taught 18 SDT-based strategies to enhance their needs supportive behaviors in clinical practice.

The primary aim of this study was to determine the effect of the CONNECT intervention on blinded observers' ratings of physiotherapists' needs supportive behavior. This is the first study to test the effectiveness of a SDT-based intervention for physiotherapists. It was hypothesized that physiotherapists who had completed the communication skills training would exhibit greater needs support compared with physiotherapists who had not completed this training.

Methods

Design

This study was a multi-center randomized controlled trial (Trial Registration Number ISRCTN63723433), comprising a cluster randomized design with intervention and control arms. A schematic view of the study is presented in Figure 1 and full details of the protocol have been published elsewhere [1]. Briefly, 24 physiotherapists and 24 patients from 4 hospital-based physiotherapy clinics were recruited into the study. All participants completed the study requirements. The Research Ethics Committees of the participating hospitals granted approval for this study and it was conducted in accordance with the Helsinki Declaration.

Randomization

Physiotherapists from each site volunteered to participate in the study prior to randomization of the clinic to intervention or control. Randomization of cluster sites (i.e., 4 hospital clinics) to intervention and control arms (1:1) was carried out by an independent researcher using a computer-based random number generator algorithm. All 4 clinics were randomly allocated at the same time, and a researcher (CL) contacted each clinic to inform them of their allocation arm. Patients were informed of the purpose of the study, but were not informed whether or not their physiotherapists' clinic had been allocated to the treatment or control condition.

Participants

Physiotherapists: Physiotherapists (five males, 19 females) working in 4 hospital outpatient physiotherapy departments were recruited, all of whom were treating patients with CLBP. Physiotherapists had between 4 and 22 years clinical experience (*M* = 9.5 years, SD = 4.4 years). Physiotherapists provided informed written consent prior to participating in the study.

Patients**:** Patients referred by a medical practitioner for physiotherapy for CLBP to 1 of the 4 hospitals during the recruitment period were sent an information leaflet outlining the purpose of the study. Informed written consent was gained from 24 eligible participants (6 males, 18 females) prior to baseline assessment. The first author, a registered physiotherapist, screened potential participants via telephone, and then in person prior to their first physiotherapy session, to determine eligibility (see Table 1 for complete inclusion

criteria). Exclusion criteria included suspected/confirmed serious spinal pathologies, nerve root involvement, and/or lack of fluency in written/spoken English.

Intervention Overview

Guided by previous SDT-based interventions with health care providers [9-11], 18 intervention-specific communication strategies were developed for use in the clinical setting by physiotherapists. A description of how each strategy maps onto the basic psychological needs constructs is presented in Table 2. To standardize delivery by the workshop leader (CL), and in turn to standardize physiotherapists' implementation of the intervention, the 18 SDT-based strategies were organized into five categories based on the 5A's Framework of Behavior Change [12] (see Table 2). The use of this framework for guiding and standardizing SDT-based interventions has demonstrated success in previous studies involving health-related behavior [9-11].

Intervention Implementation

To standardize the quality of care provided to all patients, physiotherapists from both study arms attended a 1-hour education session delivered by a physiotherapist, who holds a PhD and has >15 years research experience in LBP. This session reviewed current best evidence-based care for CLBP management, in particular regarding advice for physical activity (e.g. as part of home-based rehabilitation) and exercise prescription [13, 14]. Physiotherapists from the intervention arm additionally participated in 8 hours of

communication skills training, comprising 2 x 4-hour sessions separated by 1 week (in February 2011). All training sessions were delivered by the workshop leader, who holds a PhD in Sport and Exercise Psychology. The first training session incorporated an overview of the main SDT concepts, and covered strategies for implementing the communication skills during physiotherapy practice. To enhance the learning experience, video recordings of simulated initial treatment sessions were shown. These vignettes first depicted a physiotherapist displaying controlling communication styles, before this was contrasted with depictions of needs supportive communication behaviors. Active role play and group discussion were also used to optimize physiotherapists' comprehension and strategy implementation. At the end of the session, each physiotherapist recorded 2 or 3 goals for strategy implementation during their treatment sessions in the upcoming week, along with likely obstacles and anticipated solutions.

The second training block consisted of group discussion regarding the facilitators and barriers to implementing the communication strategies during the previous week. Further simulated video recordings of follow-up physiotherapy sessions with a controlling versus needs supportive communication style were shown, followed by group discussion between the physiotherapists and workshop leader. At the end of the session, physiotherapists revised and set new goals regarding their implementation of the SDT-based strategies over the next 4 weeks. For example, one physiotherapist set a goal to help her CLBP patients set 'SMART' (simple, measureable, achieveable, recorded, and time-based) goals regarding their home-based rehabilitation exercises, and another set a goal to replace a common controlling phrase ("I want you to do this for me, ok?") with a more needs supportive suggestion ("If you do this, you'll give yourself the best chance for improvement").

At 4 and 10 weeks following the second workshop, the workshop leader sent individualized emails to physiotherapists in the intervention arm. The purpose of these emails was to discuss progress towards the attainment of the implementation goals, and to provide assistance in resolving any problems physiotherapists were encountering when implementing needs-supportive communication in their clinical practice.

Recruitment and training of blinded raters

Three individuals were invited to participate in the study as blinded raters. Inclusion criteria were that raters held a PhD in psychology and had published research on motivation and physical activity in peer-reviewed journals, in the last 5 years. The raters participated in 2 hours of training delivered by 2 of the authors (AM & CL), during which they discussed the structure of a physiotherapy session and the principles of SDT-based communication strategies in physiotherapy. They also listened to audio recordings of sample physiotherapy sessions and practised using the measurement tools employed in this study.

Patient and physiotherapist characteristics measures

Physiotherapists: All participating physiotherapists (n = 24) completed a baseline assessment package prior to attending the initial 1-hour workshop. In addition to demographics and educational history, data were collected using *(i) The General Causality Orientation Scale (GCOS)* [15] to determine the physiotherapists' dispositional motivational orientation (autonomous, controlling, or impersonal) and (ii) *The Learning Self-Regulation Questionnaire* [16] to determine their motives for participating in a learning activity.

Patients: Patients completed a self-report questionnaire before their initial physiotherapy session, which assessed demographic and motivation variables as well as CLBP severity and disability [1]. All measures for both physiotherapists and patients are presented in Table 3.

Primary outcome measure – physiotherapists' needs support

Health Care Climate Questionnaire (HCCQ): Audio recordings were made of intial treatment sessions involving 24 physiotherapists, each with a different patient (i.e., the patient's first visit to the physiotherapist). Using a computer-based random number generator algorithm, an independent researcher randomly assigned audio recordings to the 3 raters. Raters each listened to 12 recordings and used the HCCQ to assess physiotherapists' needs supportive communication. Thus, 12 randomly selected recordings were rated by a single rater, while a further 12 were double-rated and inter-rater reliability was assessed. The 6-item HCCQ includes 7-point Likert scales, anchored at 1= not true at all, 4 = somewhat true, 7= very true [16]. Previous scores derived from the HCCQ have demonstrated good inter-rater reliability and construct validity [17].

Blinding

Patients were blinded to treatment allocation. Independent raters were also blinded to treatment allocation and study design. Due to the nature of the intervention, it was not

possible to blind the treating physiotherapists. Also, logistical constrains meant that the researcher who administered questionnaires was not blinded.

Sample Size

The required sample size was calculated using an effect size derived from a meta-analytic estimate of blinded needs support ratings associated with SDT-based training (mean effect of d = 1.4, range of 0.33 to 1.57) [18]. Using G*Power software [19], the sample size needed to detect this effect for the blinded HCCQ ratings (α = .05, 90% power) was estimated to be 20 participants, 10 in each arm. To allow for potential problems with data collection (e.g., scheduling problems or audio recording difficulties), we aimed to recruit a sample of 24 physiotherapists, 12 in each arm.

Statistical analysis

Having computed aggregate scores, skewness and kurtosis estimates were calculated for all variables. Descriptive statistics were computed for all patient and physiotherapist characteristics measures, and independent t-tests were employed to explore differences across the study arms. These tests were important because clients' or subordinates' characteristics can influence the needs support that a practitioner provides [20]. Therefore, clinical differences (e.g. differences in pain scores or functional disability) or motivational differences (e.g., patient motivation for treatment or physiotherapists' motivational orientations) across the trial arms could have influenced interactions between patients and physiotherapists.

Primary Analysis: An independent t-test was implemented to assess between-arm differences on blinded raters' HCCQ ratings. An effect size (Cohen's *d*) [21] and a 95% confidence interval was also calculated. In line with Cohen's recommendations, we interpreted *d* values of 0.2, 0.5 and 0.8 as small, moderate, and large, respectively.

Results

Data was collected between March and November 2011, with recruitment stopped once the prespecified sample size had been reach. On average, patients attended their initial appointment and had their interactions with their physiotherapist audio recorded 16.7 weeks (SD = 6.9 weeks) after the end of the CONNECT training (i.e., February, 2011). No adverse events were reported.

Patient and Physiotherapist Characteristics

Patient demographics and CLBP-related variables (e.g., pain-related disability [22] and health status [23]) were similar to previous CLBP research in Irish public hospitals [24, 25]. There were no significant ($p > .05$) or clinically meaningful between-arm differences on any patient or physiotherapist variables (Table 4).

Primary Analysis

Needs support (HCCQ) scores provided by blinded raters were normally distributed (skewness/kurtosis values in the range -1 to +1), supporting the use of independent t-tests. Inter-rater reliability on the 12 double-rated recordings was also acceptable (ICC = .79). An

independent samples *t*-test demonstrated that there was a large between-arm difference in needs support scores ($p < .001$, $d = 2.27$, 95% CI = 1.18 - 3.21), with intervention arm physiotherapists ($M = 4.57$, $SD = 0.85$) rated as significantly more supportive than control arm physiotherapists ($M = 2.78$, $SD = 0.72$).

Discussion

To the authors' knowledge, this is the first study to investigate the effect of a SDT-based communication skills intervention on physiotherapists' needs supportive behavior. Analyses indicated that the intervention had a large positive influence on physiotherapists' needs supportive behavior in clinical practice, thus supporting the main study hypothesis.

Although this is the first study to use an intervention based on SDT principles in a physiotherapy setting, other interventions have been conducted with HCPs treating patients for whom behavior change is a main focus of treatment (e.g., physicians counselling smokers to quit) [26]. A recent meta-analysis included five studies that examined the effect of SDT-based interventions on HCPs' needs supportive behavior [18]. Effect sizes associated with blinded needs support ratings in these studies ranged from 0.33 [27] to 1.57 [26]. One possibility as to why the effect in this study was relatively larger in magnitude is that physiotherapists may be particularly amenable to this type of training and, therefore, implemented the communication strategies more closely to protocol compared with HCPs in other studies. However, it should be noted that the lower bound of the 95% CI for our effect ($d = 1.18$) falls within the range of effect sizes found in other studies (0.33 to 1.57). Thus, our seemingly larger effect may be an artifact of chance attributable to our relatively small sample size. Physiotherapists may, in fact, be similar to other HCPs in their capacity to learn and implement needs supportive behavior in clinical practice.

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335 **Strengths and Limitations**

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337 It is noteworthy that this study was powered to detect differences in the primary
338 outcome, and that this outcome was collected using a gold-standard method, namely direct
339 observation by expert assessors who were blinded to treatment allocation [28]. This approach is
340 particularly valuable in order to overcome various biases associated with self- and patient-
341 reported data [29].

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343 A limitation of this study was that physiotherapists' needs support in clinical practice
344 was only assessed at one time-point. Ideally, to determine if the effects of the intervention on
345 needs supportive behaviors persist over time, physiotherapists behavior should be assessed at
346 various time points [5, 28]. Also, investigating the physiotherapists' change in needs support
347 from before to after the communication skills training would have allowed us to more
348 confidently attribute between-arm differences to the intervention effects. However, in order
349 to make valid intra-physiotherapist comparisons, it would have been necessary to collect
350 needs support ratings from multiple patients for each physiotherapist in order to obtain an
351 accurate indication of each physiotherapist's typical needs support prior to training. This
352 process would also have been required after intervention. Physiotherapists in the current
353 study indicated that the burden of data collection from multiple audio recordings was not
354 acceptable. Thus, only post intervention between-arm comparisons were possible. To address
355 this limitation, we assessed physiotherapists' motivational orientation (General Causality
356 Orientation Scale) as this has been shown to correlate with needs supportive behavior [20].
357 Baseline scores on this measure across the 2 arms of the trial were similar, thus differences in
358 needs support prior to the intervention were unlikely. Finally, one must also consider the

potential impact of the presence of the dictaphone in the treatment area, which may have resulted in physiotherapists temporarily increasing their needs supportive behavior (i.e., Hawthorne effect) [30].

Future research

Future research should employ larger samples and investigate the extent to which treatment effects endure over time. Research could also investigate the feasibility of incorporating SDT-based communication skills education into undergraduate and postgraduate education. However, the effect on patient outcomes and the cost effectiveness of the intervention should be examined before methods for widespread implementation are developed and employed [13]. Analysis of outcomes from the main CONNECT trial will provide initial evidence in this regard [1].

Conclusions

Communication that supports patients' psychological needs can lead to better outcomes, but is often not employed by HCPs. This study illustrates the feasibility of implementing SDT-based communication strategies in physiotherapy practice, and indicates that the CONNECT intervention taught physiotherapists practical communication skills that allowed them to create needs supportive environments for their patients.

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Figure Legend

Figure 1: CONSORT Flow Diagram