

# A telephonic intervention for promoting occupational re-integration in work-disabled individuals with musculoskeletal pain

Michael J L Sullivan, PhD,<sup>1</sup> Gregory Simon, MD<sup>2</sup>

<sup>1</sup>Department of Psychology,  
McGill University, Montreal  
H3A 1B1, Quebec, Canada

<sup>2</sup>Group Health Cooperative, Seattle,  
WA 98112, USA

Correspondence to: M J L Sullivan  
Michael.Sullivan@McGill.ca

doi: 10.1007/s13142-012-0119-6

## ABSTRACT

The purpose of the present research was to examine the feasibility of a telephonic occupational rehabilitation program. A sample of 23 individuals with chronic musculoskeletal pain was enrolled in the telephonic version of the Progressive Goal Attainment Program (PGAP-Tel). The PGAP-Tel is a risk-targeted intervention designed to reduce pain-related disability consequent to musculoskeletal injury. Treatment outcomes of PGAP-Tel were compared to a group of individuals with chronic musculoskeletal pain, who participated in the face-to-face format of the PGAP. Results showed that PGAP-Tel was acceptable to the majority of participants (76%) to whom it was offered. There were indications that engagement and adherence issues were more problematic in PGAP-Tel than in the face-to-face intervention. Both groups showed comparable reductions in pain, depression, fear of symptom exacerbation, and self-reported disability. Participants in the face-to-face intervention showed greater reduction in catastrophic thinking than participants in PGAP-Tel. Finally, 26% of participants in PGAP-Tel had resumed some form of employment at treatment termination compared to 56% of the participants in the face-to-face intervention. Given the low cost of the PGAP-Tel intervention and the accessibility advantages of a telephonic delivery, this type of intervention might be an important resource for targeting occupational disability in rural or remote communities when face-to-face services are not available.

## KEYWORDS

Pain, Disability, Rehabilitation, Work, Psychosocial risk factors, Telephonic intervention

## INTRODUCTION

In recent years, numerous investigations have pointed to the role of psychosocial risk factors as determinants of occupational disability in individuals with persistent pain conditions [8,30,41]. For example, several studies have been conducted addressing the role of psychosocial factors in the prediction of prolonged pain and disability associated with work-related musculoskeletal conditions [7,41]. Systematic reviews of prospec-

## Implications

**Policy:** Given the low cost of the PGAP-Tel intervention and the accessibility advantages of a telephonic delivery, this type of intervention might be an important resource for targeting occupational disability in rural or remote communities when face-to-face services are not available.

**Research:** More clinical trials are needed to evaluate the effectiveness of occupational rehabilitation interventions delivered telephonically.

**Practice:** The skill-set of PGAP-Tel is accessible to rehabilitation professionals from diverse disciplines such as psychologists, social workers, occupational therapists, physiotherapists and nurses.

tive cohort studies indicate that initial levels of perceived pain and perceived functional disability are predictive of prolonged work disability [25]. In research on work-related back injury, variables such as pain catastrophizing, pain-related fears (i.e., fear of movement/re-injury), self-efficacy, and outcome expectancies have been discussed as psychosocial risk factors for the prolonged pain and disability [30,31,41].

In response to the growing body of literature linking psychosocial factors to problematic recovery outcomes, rehabilitation interventions have moved away from medically based approaches (e.g., medication, surgery) to managing pain-related disability and have adopted a more biopsychosocial approach [6,16]. Current biopsychosocial interventions designed to target psychosocial barriers to occupational re-integration are typically offered in the context of services available through multidisciplinary pain rehabilitation centers. Intervention disciplines involved in multidisciplinary pain rehabilitation might include medicine, physical therapy, occupational therapy, and psychology [9,13].

While research has supported the effectiveness of multidisciplinary pain rehabilitation centers for reducing psychosocial risk factors for pain and disability, there are a number of disadvantages to this approach to intervention. One major disadvan-

tage is a lack of accessibility. Multidisciplinary pain rehabilitation centers are typically located in large urban areas and are relatively inaccessible to individuals living in rural or remote areas. Furthermore, multidisciplinary pain rehabilitation centers are associated with significant costs that can be beyond the financial resources of many third-party payers.

The Progressive Goal Attainment Program (PGAP) is a risk-targeted intervention designed to reduce pain-related disability consequent to musculoskeletal injury [29]. The PGAP was designed to specifically target the psychosocial factors that contribute to occupational disability. The PGAP was also designed to address the accessibility and cost challenges that have plagued multidisciplinary pain rehabilitation programs. The PGAP is administered by a single provider, and treatment is provided in the client's community of residence. To date, the results of several investigations have shown that the PGAP can be effective in reducing disability and facilitating return to work in individuals with whiplash injuries, work-related musculoskeletal injuries, and fibromyalgia [1,29,37].

In order to increase the accessibility of PGAP, the program was modified for telephonic delivery. The telephonic version of PGAP, referred to as PGAP-Tel, contains all elements of the PGAP, but there is no face-to-face contact with the clinician. All aspects of the program are delivered by telephone. With respect to accessibility, PGAP-Tel can ostensibly be offered to anyone who owns a telephone. Although efforts to systematically evaluate the effectiveness of PGAP-Tel have only recently been initiated, there are a number of research studies that have supported the effectiveness of psychosocial interventions delivered by telephone [22,23,39]. Telephonic interventions have been shown to be effective in the treatment of depression, to maximize adherence to treatment regimens, and for follow-up management of individuals being treated for substance abuse [2-4,12,24].

The purpose of the present research was to examine the feasibility of PGAP-Tel for reducing disability and facilitating return to work in individuals with chronic musculoskeletal conditions. A sample of 23 individuals with chronic musculoskeletal pain was enrolled in PGAP-Tel. Treatment outcomes were compared to a group of individuals with chronic musculoskeletal pain, who participated in the face-to-face format of the PGAP. The comparison group was selected from a larger sample of individuals who received the face-to-face version of the program and were matched to the PGAP-Tel group on sex, age, duration of work absence, and pretreatment pain severity. The study sought to determine the degree to which PGAP-Tel was acceptable to individuals with chronic pain and the degree to which individuals with chronic pain responded to this type of intervention. The two groups were compared on reductions in condition-related

symptoms (i.e., pain, depression), pain-related psychosocial risk factors (i.e., catastrophizing, fear of symptom exacerbation), and disability outcomes (i.e., self-reported disability, return to work).

## METHOD

### Participants

The study sample consisted of 46 (38 women, 8 men) individuals who were work-disabled due to a chronic musculoskeletal condition. Participants enrolled in PGAP-Tel were matched to a group that had been referred to PGAP, in terms of sex, age ( $\pm 3$  years), education ( $\pm 1$  year), pain severity ( $\pm 1$  on a 0-10 scale), and duration of work absence ( $\pm 6$  months). The mean age of the sample was 44.1 years ( $SD=6.4$ ), with a range of 30-52 years. The mean duration of work absence was 31 months ( $SD=6.1$ ). The mean number of years of education was 12.2 ( $SD=2.2$ ). The majority of the sample (74%) was married or cohabiting. At the time of referral, all participants were receiving disability benefits from a long-term disability insurer.

### Measures

*Pain severity*—Participants were asked to rate the severity of their pain on an 11-point numerical rating scale with the endpoints (0) no pain and (10) excruciating pain.

*Depression*—The Patient Health Questionnaire-9 (PHQ-9) was used as a measure of depressive symptom severity. The PHQ-9 is a nine-item questionnaire that asks respondents to indicate the frequency with which they experience each of the nine symptoms considered in the diagnostic criteria for major depression [28]. The PHQ-9 has been shown to be a valid and reliable measure of depressive symptoms in patients with a variety of medical conditions [11,14,19].

### Pain-related psychosocial variables

In the PGAP-Tel assessment protocol, abbreviated versions of the Pain Catastrophizing Scale (PCS) [35] and the Tampa Scale for Kinesiophobia (TSK) [17] were used as indices of psychosocial risk factors. Since the PGAP-Tel is a program that was designed to target psychosocial risk factors for a wide range of debilitating health and mental health conditions, the instructional set of these measures was modified to refer to "symptoms of your condition" as opposed to being worded specifically in relation to pain symptoms.

*Catastrophizing*—The measure of catastrophizing consisted of seven items drawn from the PCS [35]. Respondents were asked to indicate the frequency with which they experienced different thoughts and feelings associated with their health condition on a 3-point scale anchored with the labels "never" (0), "sometimes" (1), and "often" (2). In the current sample, the internal consistency of the catastrophizing scale was 0.78.

*Fear of symptom exacerbation*—The measure of symptom exacerbation fears consisted of five items drawn from the TSK [17]. Respondents were asked to indicate their level of agreement with statements reflecting concerns about symptom exacerbation, on a 3-point scale anchored with the labels “do not agree” (0), “somewhat agree” (1), and “completely agree” (2). In the current sample, the internal consistency of the fear scale was 0.79.

#### Disability measures

*Self-reported disability*—The measure of self-reported disability was a modified version of the Pain Disability Index [38]. As with other measures, the instructional set was modified to refer to “symptoms of your condition” as opposed to pain. Respondents rated their level of disability in five domains (home responsibilities, social activities, recreational activities, occupational activities, and self-care activities) on 11-point scales with the endpoints (0) no disability and (10) total disability. In the current sample, the internal consistency of the measure of self-reported disability was 0.90.

At treatment termination, clinicians were asked to rate the participants' return-to-work status on the following scale: (0) not working, (1) modified return-to-work program, (2) part-time work, and (3) full-time work. This work-related outcome classification scheme has been used in a previous research in occupational rehabilitation [10]

#### Treatment programs

All participants in the study sample were referred for treatment by a case manager of a long-term disability insurer. Since PGAP is a risk factor-targeted intervention, clients are only considered as potential candidates for the intervention if they obtain scores in the risk range (defined as a score above the 50th percentile) on at least one of the following measures: catastrophizing, fear of symptom exacerbation, and self-reported disability. During the first contact with the PGAP clinician, the screening evaluation was completed. In PGAP, the screening measures were completed as self-report questionnaires; in PGAP-Tel, the screening was conducted by telephone interview.

When the screening evaluation revealed that a client was an appropriate candidate, the client was provided with a copy of the information video. In PGAP, the clinician watched the video with the client; in PGAP-Tel, the video was mailed to the client. In the video, a narrator describes the negative consequences of inactivity and proposes involvement in PGAP as a means of promoting recovery and increasing quality of life. In addition, interviews with medical experts are presented, each emphasizing the importance of activity participation for the management of persistent pain conditions. The narrator also describes all procedural aspects of the intervention program. Although the narrator of the

information video states clearly that return to work is the primary goal of PGAP, she qualifies this objective by noting that even if return to work is not possible, participation in PGAP can still lead to improved quality of life by maximizing the client's involvement in meaningful and satisfying activities of daily life.

After having viewed the information video, the PGAP provider asked the client if he or she would be interested in participating in the intervention. In PGAP-Tel, the clinician called the client approximately 1 week after the video had been sent to enquire about the client's interest in participating in the intervention. If the client indicated reluctance to enroll, the clinician asked the client to consider participating for a period of only 2 weeks, after which time, if the client was not interested in continuing, the intervention would be terminated. Using this technique, the clinician communicates his/her belief that the intervention can be beneficial, communicates interest in working with the client, and reduces the degree of commitment required of the client. The rationale was to use engagement techniques that would maximize the probability that the client would be willing to begin the intervention, with the view that the development of the working relationship and initial gains made would be sufficient to maintain the clients' involvement through to completion of the intervention. The intervention was only initiated if the client agreed to participate.

In PGAP, the client was provided with a copy of the client workbook when he or she agreed to enroll in the program. In PGAP-Tel, a copy of the client workbook was mailed to the client when he or she agreed to enroll in the program. In the initial weeks of the program, the focus is on the establishment of a strong working relationship through the use of disclosure and validation techniques. The focus then changes to the development of a structured activity schedule in order to facilitate resumption of preinjury/illness activities. Each session begins with a review of the client's activity log and ends with a discussion of planned activities for the coming week. Activity goals are established in order to promote resumption of family, social, and occupational roles. Additional intervention techniques are invoked to target specific obstacles to rehabilitation progress (e.g., fear of symptom exacerbation, catastrophic thinking). In the final stages of the program, the intervention focuses on activities that will facilitate re-integration into the workplace [29].

Briefly, the focus of each PGAP session is as follows: session 1: use of disclosure and validation techniques to establish therapeutic relationship and instruction on the use of the client workbook; session 2: introduction to activity planning and re-establishing preinjury activity structure and walking routine; session 3: goal setting and planning activity involvement in relation to goals; session 4: techniques targeting disability beliefs and mid-treatment evaluation; session 5: evaluation feedback and

introduction to thought monitoring to target catastrophic thinking; session 6: exposure techniques to facilitate re-engagement in previously avoided activities; session 7: continued application of techniques addressed in sessions 5 and 6; session 8: applying task decomposition techniques to feared activities of the workplace; session 9: problem-solving challenges to resumption of occupational activities and final evaluation; and session 10: evaluation feedback and discharge planning. For more information on PGAP, the reader is referred to [www.pdp-pgap.com](http://www.pdp-pgap.com).

The PGAP differs from many other rehabilitation interventions in that most of the techniques included in the intervention have activity resumption, as opposed to symptom reduction or symptom management, as their primary objective [29]. There were several reasons for not including symptom reduction or distress reduction techniques in the treatment program. First, research indicates clearly that symptom reduction is not a precondition to successful return to work in individuals with musculoskeletal injuries [32]. Second, symptom reduction techniques, whether pharmacological or psychological, tend to be passive in nature, and passive techniques have been shown to be detrimental to return-to-work outcomes [40]. Finally, a focus on symptom reduction might inadvertently reinforce individuals' beliefs that symptoms must be eradicated before occupational activities can be resumed.

The face-to-face format of the PGAP is identical to the PGAP-Tel, with the exception that all contacts are in person, typically taking place at a clinic in the participant's community of residence or at the participants' home. All PGAP and PGAP-Tel clinicians were occupational therapists who had followed a 2-day training workshop on the techniques and procedures of the PGAP. PGAP-Tel clinicians attended an extra day of training to become familiar with a custom software application that is used for activity scheduling for telephonic service delivery. In this trial, all clinicians were part of a network of PGAP providers in Eastern Canada (<http://www.pdp-pgap.com/pgap/en/clinician.html>).

### Procedure

This program of research received ethical approval from the Institutional Review Boards of the *Centre de Recherche Interdisciplinaire en Réadaptation du Montréal Métropolitain* and McGill University. Participants in the PGAP-Tel group were consecutive referrals to a network of PGAP clinicians in eastern Canada. Once the target sample size of 23 participants enrolled in PGAP-Tel had been reached, participants in the PGAP-Tel were matched to individuals who were referred to the PGAP (face-to-face format) on age, sex, education, pain duration, and pain severity. The data for participants referred to the PGAP were drawn from a larger sample ( $N=175$ ) of individuals who were treated at the same time period by the same network of PGAP clinicians. Data for both groups were collected

over a 24-month period. Cases were computer-selected by an algorithm designed to extract a sample of the closest matching "PGAP" cases to the "PGAP-Tel" cases. On the first search pass, the algorithm selected for the following matching criteria: exact match on age, sex, education, pain duration, and pain severity. Exact matching criteria yielded only a sample of 10 cases of individuals who has completed the face-to-face PGAP. When matching criteria were changed to age ( $\pm 3$  years), education ( $\pm 1$  year), pain duration ( $\pm 6$  months), and initial pain severity ( $\pm 1$  on a 0–10 severity scale), a sample size of 23 cases for the PGAP group could be extracted. When more than one match was found, the first match was extracted and retained for data analysis.

In both the PGAP-Tel and the PGAP, sessions are scheduled weekly and are approximately 1 hour in duration. Both programs consist of a maximum of 10 weekly contacts between a trained PGAP provider and a client. The PGAP-Tel (and the PGAP) are terminated when the client indicates readiness to return to work even if fewer than 10 weeks of treatment have been completed. Measures of pain, depression, catastrophizing, fear of symptom exacerbation, and self-reported disability were administered at three points: screening evaluation, week 4 of the program, and at the termination of the program.

### Data analytic approach

Means and standard deviations were computed on all study variables. *t* tests for independent samples were used to compare the PGAP-Tel and PGAP groups on pretreatment measures. Mixed model analyses of variance were computed on pretreatment and post-treatment measures of pain, depression, catastrophic thinking, pain-related fears, and self-reported disability. Since the primary goal of PGAP is to facilitate the resumption of occupational activities, discontinuation of treatment before the end of the 10-week program is not considered a treatment dropout if the participant returned to work. For the purposes of this study, a participant was considered to have dropped out of treatment if he/she attended less than 10 sessions of the program and did not return to work. For participants who dropped out, the pretreatment evaluation scores were carried forward as the participant's posttreatment scores. Percentage change values on measures of pain, function, and psychosocial risk are presented in order to compare the clinical significance of change between the two groups.

## RESULTS

### Sample characteristics

Table 1 provides information about employment-related variables for participants in the two treatment groups. As a result of the matching procedure, the two groups were comparable on age, education, and duration of work absence. The most frequently represented occupational categories were trades,

**Table 1** | Sample demographics and employment-related variables

	PGAP-Tel	PGAP	<i>P</i>
Sex (women/men)	19/4	19/4	
Age	45.3 (5.9)	43.0 (6.7)	0.19
Months off work	30.1 (6.9)	30.0 (5.8)	0.96
Education (years)	13.4 (3.0)	12.2 (3.2)	0.19
Occupation			
Laborer	4	5	
Tradesperson	3	6	
Health field	10	6	
Office/clerical	4	5	
Driving	1	0	
Retail	1	0	
Food industry	1	1	
Primary pain site			
Back	17	20	
Neck	4	2	
Shoulders	2	1	

*N*=46. Values in parentheses are standard deviations

manual labor, health-related, and clerical occupations. The distribution of occupations was similar in both treatment groups, although cell sizes were too small to compute statistical analyses.

The two groups differed with respect to region of residence. Individuals referred to PGAP-Tel resided in regions characterized as rural or semirural (population less than 15,000); individuals referred to PGAP resided in urban areas.

Table 2 shows the means and standard deviations on pretreatment measures for participants in PGAP-Tel and PGAP. There were no differences between groups on pretreatment pain severity ( $t(44)=0.41$ , not significant), depression ( $t(44)=0.03$ , not significant), catastrophizing ( $t(44)=-1.7$ , not significant), fear of symptom exacerbation ( $t(44)=0.68$ , not significant), or self-reported disability ( $t(44)=-0.57$ , not significant).

#### Correlations among pretreatment measures

As shown in Table 3, measures of pain severity, catastrophizing, fear of symptom exacerbation, and self-reported disability were significantly intercorrelated ( $r$  range=0.32–0.57). Depression was significantly correlated with catastrophizing and self-reported disability, but not with pain severity or fear of symptom exacerbation. The direction and magnitude of these correlations is similar to that which has been

reported in a previous research using the original versions of these measures [15,29,34].

#### Acceptability of the PGAP-Tel to the client population

The ultimate impact of an intervention program is determined in part by the degree to which individuals are agreeable to participate in it. Of 30 individuals who were invited to participate in PGAP-Tel, 23 agreed after having viewed the information video, representing an acceptability rate of 76%. Of the 23 individuals who agreed to participate, 5 initially declined but then agreed to participate when asked for a commitment of only 2 weeks. All five participants who agreed to a 2-week commitment went on to complete 10 weeks of treatment. In this study, the acceptability rate for the group enrolled in PGAP could not be assessed since these clients were not consecutive referrals, but rather were selected from a larger sample to match the PGAP-Tel group. In previous research, over 80% of individuals who were invited to participate in the PGAP agreed to take part in the intervention [29].

#### Treatment engagement and treatment dropout

The number of missed appointments was considered as an index of treatment engagement. In participants

**Table 2** | Means and standard deviations on pretreatment pain-related variables

	PGAP-Tel ( <i>N</i> =23)	PGAP ( <i>N</i> =23)	<i>P</i>
Pain severity (0–10)	7.0 (1.5)	6.8 (1.3)	0.69
Depression (PHQ-9)	16.4 (5.0)	16.3 (4.0)	0.97
Catastrophizing	8.3 (2.6)	9.6 (2.7)	0.09
Fear	4.5 (10.3)	5.1 (9.7)	0.49
Disability	32.3 (12.3)	34.4 (12.1)	0.56

*N*=46. Values in parentheses are standard deviations

**Table 3** | Correlations among scores on pretreatment measures

	1	2	3	4
Pain				
Depression	0.20			
Catastrophizing	0.39**	0.35**		
Fear	0.33*	0.16	0.46**	
Disability	0.33*	0.43**	0.41**	0.57**

*N*=46. Significance tests are two-tailed  
\**P*<0.05; \*\**P*<0.01

enrolled in PGAP-Tel, a missed appointment was defined as an occurrence where the clinician called the participant for a scheduled meeting but the participant did not answer. For PGAP, a missed appointment was defined as a participant failing to be present at a scheduled meeting. The mean number of missed appointments was slightly higher in the PGAP-Tel group (*M*=1.04, *SD*=0.87) than in the PGAP group (*M*=0.65, *SD*=0.83), but the difference was not statistically significant (*t*(44)=1.5, *P*=0.12).

In the PGAP-Tel group, 6 participants (26%) dropped out and 3 of the participants (13%) in the PGAP group dropped out. The difference in drop-out rates was not significant ( $\chi^2=0.94$ , *P*=0.32).

**Changes in pain-related measures through the course of treatment**

Table 4 shows the means and standard deviations for pain-related measures prior to and at the end of treatment. A two-way (group×time) repeated measures analysis of variance (ANOVA) on pain severity revealed only a main effect for time (*F*(1, 44)=19.6, *P*<0.001). Examination of the means reveals that participants in both groups showed significant reductions in pain severity through the course of treatment.

A two way (group×time) repeated measures ANOVA on depression scores revealed only a main effect for time (*F*(1, 44)=33.6, *P*<0.001). Examination of means indicates that both groups showed reductions in depression through the course of treatment.

A two-way (group×time) repeated measures ANOVA on catastrophizing scores revealed a main effect for time (*F*(1, 44)=14.4, *P*<0.001) and a significant interaction (*F*(1, 44)=4.8, *P*<0.05). Tests of simple effects revealed that participants in the

PGAP group showed larger reductions in catastrophizing than participants in the PGAP-Tel group (*t*(44)=2.3, *P*<0.05).

A two-way (group×time) repeated measures ANOVA on fear of symptom exacerbation scores revealed only a main effect for time, (*F*(1, 44)=30.8, *P*<0.001). As shown in Table 3, both groups showed reductions in fear of symptom exacerbation through the course of treatment.

A two-way (group×time) repeated measures ANOVA on self-reported disability scores revealed only a main effect of time (*F*(1, 44)=18.0, *P*<0.001). Both groups showed reductions in self-reported disability through the course of treatment.

**Clinical significance of treatment-related changes**

It has been suggested that reductions in measures of pain and distress that are in excess of 30% are considered clinically meaningful [5]. Participants were dichotomized in relation to whether or not they showed a 30% or greater reduction on each of the dependent measures. Participants in PGAP-Tel were somewhat less likely (26%), than participants in PGAP (43%), to show clinically meaningful reductions in pain, although the difference was not statistically significant ( $\chi^2=1.5$ , *P*=0.21). Participants in PGAP-Tel were as likely (30%) as participants in PGAP (26%) to show clinically meaningful reductions in depression ( $\chi^2=0.11$ , *P*=0.74) as well as fear of symptom exacerbation (47% vs. 65%) ( $\chi^2=1.4$ , *P*=0.23). Participants in PGAP-Tel were less likely (26%), than participants in PGAP (56%), to show clinically meaningful reductions in catastrophizing ( $\chi^2=4.4$ , *P*<0.05).

**Return-to-work outcomes**

Figure 1 shows the distribution of return-to-work outcomes assessed at termination of treatment.

**Table 4** | Changes in pain-related measures through the course of treatment

	PGAP-Tel			PGAP		
	Pre	Post	Ch%	Pre	Post	Ch%
Pain severity	7.0 (1.5)	6.0 (1.9)	-15%	6.8 (1.3)	5.0 (2.3)	-30%
Depression	16.4 (4.0)	13.5 (4.9)	-20%	16.3 (5.0)	13.7 (5.6)	-22%
Catastrophizing	8.3 (2.6)	7.4 (3.0)	-17%	9.6 (2.7)	6.7 (4.6)	-39%
Fear	4.5 (2.5)	3.6 (2.5)	-23%	5.1 (3.3)	3.8 (3.5)	-36%
Disability	32.3 (12.3)	26.4 (12.5)	-18%	34.4 (12.1)	26.0 (13.7)	-24%

*N*=46. Values in parentheses are standard deviations. Ch%=percentage reduction in scores from pretreatment to posttreatment

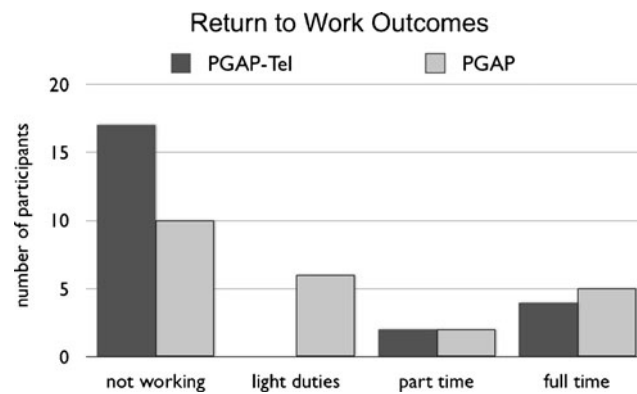


Fig. 1 | Distribution of return-to-work outcomes assessed at termination of treatment

Participants enrolled in PGAP were more likely (56%), than participants enrolled in PGAP-Tel (26%), to be involved in work in some capacity at treatment termination ( $\chi^2=7.9$ ,  $P<0.05$ ). Similar numbers of participants in PGAP-Tel and PGAP had returned to full-time or part-time work. None of the participants in PGAP-Tel were involved in light duty work compared to 26% of participants in PGAP.

## DISCUSSION

The present study was a preliminary investigation of the acceptability, feasibility, and effectiveness of PGAP-Tel. While occupational rehabilitation interventions are typically offered in a face-to-face format, there are conditions under which such a delivery model might not be possible. In many rural or remote regions, specialized services in the occupational rehabilitation are not available. Even when occupational rehabilitation services are available, programs specifically designed to target psychosocial barriers to work resumption might not be available. Interventions that can be delivered telephonically might permit provision of specialized services that would otherwise not be accessible to individuals living in underserved regions.

One of the questions addressed in this study concerned the acceptability of a telephonic occupational rehabilitation intervention to the client population. In the sample of individuals who were offered participation in PGAP-Tel, 76% agreed to participate. This value is comparable to the proportion of individuals who agreed to participate in the face-to-face version of PGAP [29].

The acceptability of PGAP-Tel needs to be considered in relation to the context within which treatment was offered. All participants in this study were receiving salary compensation from a long-term disability insurer. Insurance policy typically requires that clients actively engage in interventions designed to mitigate their losses. This does not mean that clients must accept all treatments that are offered, but refusing all treatment could have negative implications for a client's continued access

to insurance benefits. It is possible that clients' perceptions of the potential negative consequences of refusing treatment might have acted as an incentive to agree to participate in treatment.

PGAP-Tel was previously included in a trial conducted with recipients of disability insurance with the Social Security Administration (SSA) of the United States [21]. Recipients of disability insurance were offered health care insurance, PGAP-Tel, and benefits counseling. This group was compared to a group who only received health care insurance, and a group who received no additional services. The study sample was heterogeneous, including individuals with a variety of chronic debilitating health and mental conditions. In that trial, the rate of agreement to participate in PGAP-Tel was only 36%, and on average, providers made six unsuccessful calls before reaching participants for sessions [21]. There are a number of possible explanations for the lower rate of PGAP-Tel participation in SSA disability insurance recipients. In order to access social security benefits, individuals must make a convincing case that they are currently (and in the foreseeable future) competitively unemployable. Individuals who engage in the process of accessing social security benefits might not consider enrollment in an occupational rehabilitation program to be an attractive treatment option. It is also possible that the severity of individuals' health or mental health conditions was such that they were not able to consider return to work as a feasible treatment objective.

The two treatment groups also differed significantly in terms of return-to-work status at the termination of treatment. Although, participants in PGAP-Tel and PGAP were equally likely to have resumed part-time or full-time work, fewer participants in PGAP-Tel were involved in a modified return-to-work trial (i.e., light duties) than individuals in PGAP. The availability of modified work duties has been shown to play a significant role in fostering successful resumption of occupational activities [18]. The development of a modified return-to-work trial requires a series of procedures and steps that might be easier to accomplish when the clinician is fluent in the resources and services

available in the participant's community of residence. In order to develop a modified return-to-work trial, a clinician might need to meet with the insurance case manager, the employer, and other professionals involved in the care of the participant. The clinician might also need to visit the place of work in order to determine the nature of the occupational activities that will comprise the modified return-to-work trial. These procedures and steps will likely be more challenging to execute in remote communities and over the telephone. Differences in employment opportunities in rural and urban regions might also have contributed to group differences in return to work.

Return to work was achieved in 26% of participants in PGAP-Tel, suggesting that for at least some individuals, return-to work is an achievable goal of a telephonic rehabilitation program. These gains were made through a program delivered by a single interventionist. Given the low cost of the PGAP-Tel intervention (approximately 10–15 h of clinical contact), this type of intervention might be an important resource for targeting occupational disability when face-to-face services are not available. For clients living in rural and remote communities, displacement for treatment, of the client or the clinician, can be associated with significant costs. For these individuals, a telephonic intervention could be associated with significant reduction in costs and inconvenience.

Participants in the PGAP-Tel group missed slightly more appointments than participants in PGAP and were more likely to drop out of treatment (26% vs. 13%). The difference in drop out was not statistically significant but suggests that engagement issues might be more problematic in telephonic interventions. A central element of client engagement of a client in a psychosocial intervention concerns the strength of the working alliance [20]. It is possible that the development of a strong working alliance might be more challenging in a telephonic intervention than in a face-to-face intervention. During a telephonic intervention, the client does not have access to the clinician's facial reactions or gestures that might provide important relationship-building information.

It is likely, however, that factors other than working alliance issues contributed to differences in engagement between the two treatment groups. Research on telephonic psychotherapeutic interventions for depression reveal attrition rates of less than 10% [24]. As such, the higher dropout rate in PGAP-Tel cannot be attributed solely to the mode of treatment delivery. An important distinction between PGAP-Tel and psychotherapy for depression is that the objective of PGAP-Tel is return to work, while the objective of psychotherapy for depression is distress reduction [39]. It is possible that individuals will be more motivated to participate in a distress reduction intervention than a return-to-work intervention.

Participants in the PGAP-Tel group showed comparable reductions in pain and depression to participants in the PGAP group. Overall, 35% of participants showed clinically meaningful reductions in pain, and 28% of participants showed clinically meaningful reductions in depression. When considered in terms of a treatment success threshold of 30% reduction in symptom severity, the results suggest that three to four participants need to be treated in PGAP-Tel or PGAP in order to achieve one treatment success. Numbers needed to treat (NNT) of this magnitude would be considered indicative of effective treatments for pain or depression [42].

PGAP-Tel was less effective than PGAP in reducing scores on the measure of catastrophizing. In numerous investigations, reductions in catastrophizing have been identified as a significant determinant of successful rehabilitation outcome [26,27,30]. The approach used in PGAP-Tel (and PGAP) to reduce catastrophizing includes education, the use of disclosure and validation techniques, thought monitoring/re-appraisal, goal setting, and activity participation. In previous research, these techniques have been shown to be effective in reducing catastrophic thinking [33,36,43]. It is not clear why these techniques are less effective when used telephonically as opposed to face-to-face. One possibility is that differences in the working alliance might have impacted on the participant's motivation to adhere to all aspects of the intervention. Participants in PGAP-Tel can choose not to complete an exercise in their client workbook without the knowledge of the clinician. In the face-to-face version of PGAP, the client and the clinician review the contents of the client workbook at the beginning of every session. In this sense, clients in the face-to-face version of PGAP are held more accountable for completing the client workbook. Lack of compliance with any aspect of the program would be apparent to the clinician in the face-to-face PGAP since the participant is asked to bring his/her workbook to each meeting. It is possible that compliance problems were more frequent in the PGAP-Tel group than in the PGAP group.

The findings of the present study must be considered in light of several limitations. First, a no-treatment control group was not included, and therefore, changes observed through treatment cannot unambiguously be attributed to either treatment program. In addition, the small sample size placed limits on the nature of statistical procedures that could be used to examine processes that accounted for treatment outcomes in the PGAP-Tel and PGAP groups, and many analyses were likely underpowered. Several nonsignificant findings (e.g., dropout rates, missed appointments) might have been significant with a larger sample. It is also important to consider that only individuals with high scores on psychosocial risk measures were included in the trial. It is possible that regression toward the mean



might have contributed to the pattern of findings, given that high scores have a greater probability of decreasing than increasing.

All individuals in this study were referred for treatment by a long-term disability insurer. It is possible that individuals' perceptions of the consequences of refusing treatment might have augmented participation rates. Although efforts were made to equate the two groups on several demographic and pain-related variables, the two groups nevertheless differed in terms of region of residence. It is possible that individuals in rural communities had fewer occupational re-entry opportunities, and this might have contributed to lower return-to-work rates in the PGAP-Tel group. It is also important to note that the majority of participants in this study were women, which limits the generalizability of the findings.

In spite of these limitations, the findings of the present study provide preliminary evidence that a telephonic occupational rehabilitation intervention can lead to clinically significant reductions in pain-related psychological variables in individuals with chronic musculoskeletal conditions. These preliminary results suggest that a randomized clinical trial of PGAP-Tel would be warranted. It would also be of interest to compare the outcomes of the PGAP-Tel to more costly multidisciplinary rehabilitation programs currently used in the treatment of individuals with disabling musculoskeletal conditions.

**Acknowledgments:** The authors are grateful to the Centre for Rehabilitation and Health and their network of clinicians who contributed data for the preparation of this paper. The authors also thank Beatrice Garfinkel for data coding and data entry.

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