ORIGINAL ARTICLE

Clinical experience with a chronic pain management programme in Hong Kong Chinese patients

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Objective To describe experience with a chronic pain management programme in Hong Kong Chinese patients.

Design Prospective study.

Setting Regional hospital, Hong Kong.

Participants Patients with chronic pain who participated in the first six Comprehensive Out-patient Pain Engagement programmes between 2002 and 2005.

Intervention Comprehensive Out-patient Pain Engagement is a 14-day structured, multidisciplinary out-patient programme conducted over 6 weeks. It includes pain education, cognitive re-conceptualisation, training in communication skills and coping strategies, graded physical exercises and functional activities training. It aims to improve patient function and quality of life, despite persistent pain.

Main outcome measures Changes in scores from baseline values after joining the programme, with respect to several assessment tools. These included the following: visual analogue pain scale, Pain Catastrophizing Scale, Patient Self-efficacy Questionnaire, Canadian Occupational Performance Measure, Medical Outcome Survey–Short Form 36 Questionnaire, and duration of physical tolerances, medication utilisation, and work status records.

Results Forty-five patients were available for analysis. After the Comprehensive Out-patient Pain Engagement programme, improvements in Medical Outcome Survey–Short Form 36 Questionnaire (role physical and vitality), Pain Catastrophizing Scale, Patient Self-efficacy Questionnaire, and Canadian Occupational Performance Measure were demonstrated ($P<0.05$). The duration of standing and sitting tolerances increased ($P<0.05$). An improvement in employment rate was also evident ($P=0.01$).

Conclusion The initial results of our management programme in Chinese patients with chronic pain are encouraging. This type of programme should be promoted more widely in this group of patients, as it appears to improve physical function, psychological well-being, and productivity.

Key words
Chronic disease; Cognitive therapy; Combined modality therapy; Pain management; Quality of life

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Introduction

The prevalence of chronic pain in the Hong Kong population is 10.8%,[1] which is comparable to western countries reporting a median prevalence of 15%.[1,2] It is well-known that chronic pain patients have significant suffering, associated with psychological and physical disabilities that result in loss of employment, financial burden, and impaired quality of life.[3-5] Chronic pain is often difficult to treat, and in many patients it persists, despite multiple modalities of treatment. Under these circumstances, patients should not merely seek pain relief, rather they should learn to manage their persistent pain and live a productive life.

Multidisciplinary pain management programmes based on cognitive behavioural intervention have gained popularity worldwide. Their key objectives are: the modification of maladaptive pain beliefs and behaviour, improvement of physical function, promotion

of the concept of self-management, and reduction of reliance on medication. This type of programme usually consists of pain education, graded exercises and activity training, relaxation therapy, cognitive behavioural modification, coping strategies, and social skills training conducted in an integrated way.[6]

Pain management programmes based on the biopsychosocial concept of pain have been shown to be effective in improving outcome in mood disorders and neurosis[7] as well as in chronic pain.[8-10] Recent systematic reviews have shown that they result in significantly greater relief, positive coping, and decreased behavioural pain expression.[11] Patients also enjoyed improved functional status and behavioural outcomes compared to controls (patients on waiting-lists awaiting treatment, or those offered usual care with a non-multidisciplinary approach).[12-14]

In another systematic review of chronic and recurrent low back pain, there was evidence that an occupational setting reduced pain, improved function and return-to-work rate better than exercises, manipulation, myofascial therapy, advice, placebo treatment, or merely being on the waiting list.[15] Similarly, a recent randomised controlled trial in patients with temporomandibular pain disorder consolidates the evidence that cognitive behavioural intervention is effective in improving functional outcomes.[16]

A pain management programme based on cognitive behavioural intervention has only recently been introduced in Hong Kong, and early experience indicated it was useful for improving physical function in Chinese patients with chronic pain.[17] This study examined the application and 1-year outcomes of the pain management programme conducted at our institution (the Alice Ho Miu Ling Nethersole Hospital), which has been running since 2002.

華裔病人參與長期痛症抗痛計劃的臨床經驗

目的 敍述華裔病人參加長期痛症抗痛計劃的經驗。

設計 前瞻性研究。

安排 分區醫院，香港。

參與者 於2002至2005年患長期痛症並參與六次綜合抗痛門診服務的華裔病人。

療法 綜合抗痛門診服務是一個跨科門診計劃，在6星期內上課14天，旨在幫助病人在疼痛難於消除的情況下，仍能改善日常的活動，提高生活素質。計劃內容包括教育病人認識痛症，學習認知行為痛症療法、溝通技巧和應付疼痛的策略，進行有程度劃分的運動和功能活動。

主要結果測量 利用以下幾種評鑑工具，量度病人在參加計劃後相對於基線值的得分變化，包括視覺模擬標定法、疼痛災變數表評分、病人自我效能感問卷、加拿大作業活動測量表、健康狀況問卷簡化版（MOS SF-36）、耐力、用藥和工作狀況紀錄。

結果 共有45位病人的結果可用作分析。參加綜合抗痛門診計劃後，MOS SF-36健康狀況問卷（軀體角色和活力）、疼痛災變數表評分、病人自我效能感問卷以及加拿大作業活動測量表的得分均有改善（$P<0.05$），而坐立的時間亦有增加（$P<0.05$），就業率明顯提高（$P=0.01$）。

結論 華裔病人參加綜合抗痛門診計劃初步成績令人鼓舞。這類計劃能改善病人的身體功能、心理健康以至生產力，所以應在有需要的病人中大力推廣。

Methods

Programme overview

The Comprehensive Out-patient Pain Engagement (COPE) programme consisted of 14 full days of structured, multidisciplinary out-patient sessions, conducted over 6 weeks. It included pain education, training in communication skills and coping strategies, graded physical exercises and functional activities training. Coping skills training included strategies on cognitive re-conceptualisation of pain, goal and action planning, activity pacing, thought challenging exercises, desensitisation and relaxation techniques (Appendix). A multidisciplinary team of staff, including pain nurses, a pain specialist, clinical psychologist, physiotherapist, occupational therapist, and medical social worker took part in the programme.

Patient selection

All patients who participated in the first six COPE programmes were included in this study. All new chronic pain patients referred to our pain management centre from 2002 to 2005 were initially evaluated by our pain medicine specialist and clinical psychologist. Suitable patients were then referred to the COPE programme. They were interviewed further and assessed by the programme manager (nurse) according to specific selection criteria (Box) before being admitted into the programme. The objectives of the programme were described to each patient to clear up any misunderstandings about curing their pain or obtaining pain relief through attendance. It

BOX. Inclusion criteria

1. Chronic pain longer than 3 months irrespective of site and pathology
2. No progress in rehabilitation despite treatment
3. No further option for medical or surgical treatments
4. Reliance on medication and other aids
5. Distress and disability due to the pain
6. No active major psychological disorder or primary addiction problem
7. No severe physical impairment
8. No literacy/language difficulty
9. Agreement and commitment to participate in the programme

was explained that the main aim was to train each patient to be more functional. Written informed consent and a contract of commitment were obtained from all those who agreed to attend the programme.

Measurement

Patient demographics and outcome data were collected at baseline and at 1, 6, and 12 months after joining the programme. Outcome measures including pain score, anxiety and depression scores, self-efficacy, extent of negative pain perception, functional outcomes including perceived self-capability and satisfaction, duration of physical tolerances and health-related quality of life, medication utilisation, and work status were all assessed.

Measurement tool

A 100-mm visual analogue scale (VAS), where 0 mm indicates no pain and 100 mm indicates worst pain, was used to assess the degree of pain. Anxiety and depression were screened using a validated Chinese version of Hospital Anxiety Depression (HAD) Scale.[18] The Chinese version of Pain Catastrophizing Scale (PCS[19]) was used to assess negative orientation towards pain, while the translated Chinese version of the Patient Self-efficacy Questionnaire (PSEQ[20]) was employed to measure perceived self-ability to deal with daily activities. The Canadian Occupational Performance Measure (COPM)—a client and task-oriented tool—was used to assess subjective performance and satisfaction in daily activities. The Medical Outcome Survey–Short Form 36 (SF-36) Questionnaire consisting of eight domains (validated in Chinese) was used to measure general health-related quality of life.[21] Physical activities such as the duration of standing and sitting tolerances, work status, and analgesic consumption pattern were also recorded.

Statistical analyses

Where possible, demographic data were analysed with parametric tests, while the Chi squared test was employed for categorical data. Statistical analyses for outcome measures were performed by repeated measures analysis of variance using the Statistical Package for the Social Sciences (Windows version 10.0; SPSS Inc, Chicago [IL], US). A level of significance of $P<0.05$ was accepted for the study.

Results

Forty-nine patients were recruited into our COPE programme from 2002 to 2005. Three patients withdrew from the programme because they could not meet its physical demands, and one other who required further investigation. Data from these four patients were not analysed. The demographic data of our patient cohort are summarised in Table 1. The commonest pain location was the back, followed by the upper limbs and the lower limbs.

TABLE 1. Patient demographic profiles and pain localisation (n=45)

Characteristic	Value
Gender (male:female)	15:30
Median age (range) [years]	42 (23-57)
Median duration of pain (range) [months]	46 (12-333)
Pain location	
Back	26
Limbs	10
Neck	3
Chest	2
Multiple sites	2
Others	2

The pre-programme (baseline), 1-month, 6-month, and 12-month scores after joining the programme for the VAS, HAD (Anxiety) and HAD (Depression), PCS, and PSEQ instruments are summarised in Table 2. There were statistically significant improvements from corresponding baseline scores for the PCS at 6 and 12 months ($P=0.04$), and the PSEQ at 1 month ($P=0.01$) though not at 6 and 12 months.

We found significant improvement in both the satisfaction ($P<0.005$ at 1 month, $P=0.04$ at 6 months, $P<0.005$ at 12 months) and performance scales ($P<0.005$ at 1 month, $P=0.04$ at 6 months, $P<0.005$ at 12 months) of the COPM, while improvement in the duration of functional tolerances (sitting and standing tolerances) was also significant, both doubling over the 6-month period ($P<0.005$ for sitting; $P<0.005$ for standing) and maintained at 12-months ($P<0.005$ for sitting; $P=0.02$ for standing) [Table 2].

Baseline SF-36 scores were generally comparable with the previous epidemiological study on chronic pain in Hong Kong patients.[22] All domains were lower than the norm in the local general population (Table 3),[23] and there was a marginal trend for improvement of scores in most domains. However, only the improvements in role physical ($P=0.03$ at 6 months, $P=0.01$ at 12 months) and role emotional ($P=0.03$ at 6 months, $P=0.02$ at 12 months) were statistically significant.

There was a significant improvement in work status (Fig) as the percentage of patients in full-time work increased from 4 to 22% ($P=0.01$). Compared to their baseline status, those not working and not searching for job dropped from 38% to 4% ($P<0.001$), while a high proportion had become students again.

TABLE 2. Patient outcomes*

Outcome measures (range of scale)	Mean (95% confidence interval)			
	Baseline	1-month post-COPE	6-month post-COPE	12-month post-COPE
VAS (0-10)	5.7 (5.2-6.2)	5.9 (5.5-6.3)	5.7 (5.1-6.3)	6.0 (5.5-6.5)
HAD (Anxiety) [0-21]	11.4 (10.1-12.7)	12.0 (10.6-13.3)	11.5 (10.1-13.0)	11.3 (9.7-12.9)
HAD (Depression) [0-21]	11.0 (9.5-12.5)	11.2 (10.0-12.4)	10.9 (9.5-12.4)	11.0 (9.4-12.7)
PCS (0-52)	33.7 (30.0-37.3)	31.3 (28.4-34.2)	30.1 (26.5-33.7)†	29.9 (26.4-33.4)†
PSEQ (0-60)	22.9 (19.1-26.8)	27.5 (23.9-31.1)†	26.9 (23.4-30.5)	26.0 (21.7-30.4)
COPM (satisfaction) [0-10]	3.0 (1.7-4.2)	5.8 (4.6-7.0)†	5.2 (3.9-6.4)†	5.5 (4.7-6.2)†
COPM (performance) [0-10]	3.0 (1.7-4.2)	5.8 (4.5-7.0)†	5.2 (3.9-6.4)†	5.4 (4.7-6.2)†
Standing tolerance (minutes)	12.2 (9.7-14.7)	21.8 (14.8-28.8)†	23.5 (17.0-30.0)†	23.1 (14.1-32.1)†
Sitting tolerance (minutes)	14.7 (11.9-17.6)	28.4 (21.8-35.0)†	30.5 (24.1-36.9)†	27.3 (21.9-32.7)†
No. of regular analgesics	1.2 (0.9-1.4)	1.0 (0.7-1.3)	1.0 (0.7-1.4)	1.0 (0.7-1.2)

* **COPE denotes Comprehensive Out-patient Pain Engagement programme; VAS visual analogue pain scale, HAD Chinese version of Hospital Anxiety Depression Scale, PCS Chinese version of Pain Catastrophizing Scale, PSEQ Chinese version of Patient Self-efficacy Questionnaire, and COPM Canadian Occupational Performance Measure**

† **Statistical significance compared with baseline (P<0.05)**

TABLE 3. Medical Outcome Survey–Short Form 36 (SF-36) Questionnaire results compared to the normal population

Domain	Mean (95% confidence interval)				
	Population norm[23]	Baseline	1-month post-COPE	6-month post-COPE	12-month post-COPE
Physical functioning	91.8 (91.3-92.3)	44.0 (38.2-49.7)	46.7 (40.7-52.8)	46.9 (40.9-52.8)	47.3 (41.5-53.1)
Role physical	82.4 (81.2-83.7)	0.58 (-0.6-1.8)	5.8 (-0.2-11.8)	7.6 (1.6-13.5)*	9.3 (2.6-16.0)*
Bodily pain	83.9 (83.1-84.9)	21.9 (19.3-24.5)	24.2 (20.4-27.9)	24.2 (18.5-29.9)	25.4 (20.6-30.1)
General health	55.8 (55.2-56.8)	34.6 (29.6-39.7)	35.2 (30.3-40.2)	36.2 (29.7-42.6)	33.8 (27.3-40.4)
Vitality	60.2 (59.5-61.0)	32.9 (27.3-38.5)	33.4 (28.2-38.6)	34.7 (29.5-39.8)	33.5 (26.4-40.6)
Social functioning	91.2 (90.5-91.9)	35.4 (29.3-41.6)	34.2 (28.6-39.8)	38.6 (32.4-44.8)	37.4 (30.2-44.6)
Role emotional	71.7 (70.1-73.2)	5.4 (0.97-9.8)	7.7 (1.1-14.4)	13.9 (5.2-22.6)*	16.3 (6.4-26.1)*
Mental health	72.8 (72.1-73.5)	45.8 (40.1-51.4)	40.4 (35.3-45.5)	44.5 (38.9-50.0)	42.7 (36.1-49.3)

* **Statistical significance compared with baseline (P<0.05)**

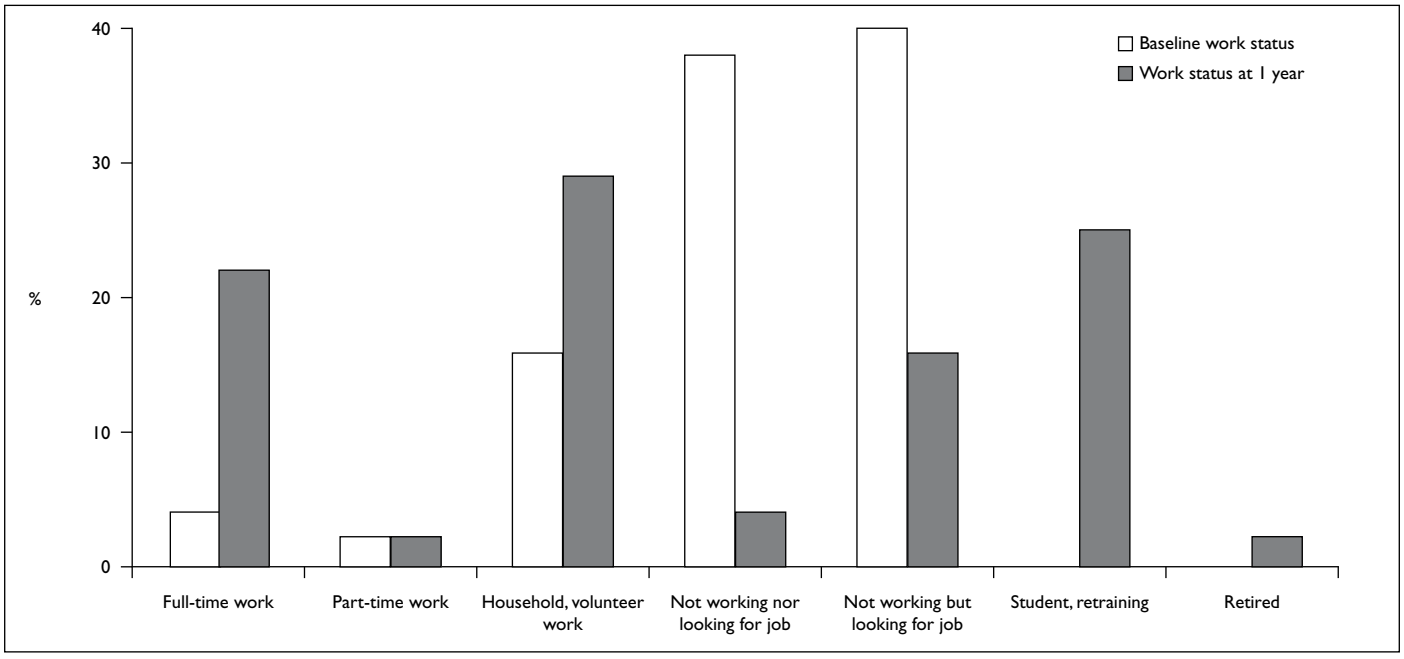

FIG. Baseline work status and work status at 1 year

Discussion

All patients were reviewed at the Pain Management Centre at 1 month, 6 months, and 12 months after the programme. During these follow-up reviews, they were encouraged to keep up with the pain management strategies they learnt during the COPE programme. The most common pain location was the back and the limbs, and included pains diagnosed as musculoskeletal and neuropathic. In this series, only 45 patients completed the programme to undergo a 1-year evaluation. Thus, they represented only a very small proportion of our chronic pain patient population. Although we report serial changes in our patient group, intention-to-treat analysis was not feasible, because outcome data on dropouts were not available or measurable. Nevertheless the initial results are encouraging, and the programme appears to help patients with a variety of chronic pain syndromes, including those for whom there was no clear understanding of the underlying mechanisms.

Improvement in the PCS measurements was observed at 6 months and maintained at the 12 months' follow-up. This is important as significant catastrophising impedes rehabilitation, as patients tend to focus on the pain and negative effects of their condition. Directing the patients away from the pain allows them to focus on their willingness and ability to learn to manage their physical functions and activities despite pain. The COPE programme also improved patient self-efficacy. In our patients, PSEQ improved significantly at 1 month, but not thereafter. However, there was a trend towards improvement compared to baseline at both 6 and 12 months. This observation may be related to our small sample size. Nevertheless, it is important that patients should continue to be supported and encouraged to continue practising and using the strategies learned during the programme, even after completing it. Otherwise the improved function and behaviour may not be sustained, especially in patients coping with significant psychological barriers. A maintenance plan to reinforce the principles and strategies of the pain management programme should be available. It is important that all health care workers looking after the patients should be directed to give the same advice to the patients and avoid conflicting information. In this respect, general practitioners are helpful in monitoring and reinforcing patient improvements.

The SF-36 health survey is a measure of perceived health-related quality of life. In general, our pain patients had very low baseline SF-36 scores compared to the local population norm, which was consistent with the impaired quality of life in our chronic pain population.[22] Only role emotional and physical domains improved significantly, although most domains showed improving trends that may be related to our small patient sample. In addition, improvement in health-related quality of life may lag functional and vocational changes and require longer follow-up to reveal.

The COPM is a client- and task-oriented assessment of subjective performance and satisfaction in daily activities. Generally increasing trends in scores for both the satisfaction and performance scales of the COPM were observed. Patients were more satisfied with their own performance after the programme. On the other hand, the exercise-training component contributed to the substantial increase in endurance, as shown in the duration of sitting and standing tolerances. Tolerance durations increased 2-fold, though the 12-month improvement was not large. Improvements in sitting and standing tolerances must have benefited the patients substantially in their ability to conduct their daily activities.

Ours is not a 'work-hardening' or 'return-to-work' programme. Nonetheless after joining it, an additional 18% (95% confidence interval, 5.5-28.8%) of our participants returned to full-time work following improvement in their functional and psychological well-being (Fig). This observation was particularly encouraging and significant, as 35 of our patients started with an injury on duty, and their work rehabilitation was invariably complicated by their entitlement to compensation under the Employee Ordinance. In Hong Kong an injured worker is entitled to 80% of the basic salary for up to 2 years, during his or her absence from work due to injury. We did not study the relationship between compensation and outcome of pain management, though there is evidence that rehabilitation outcome is adversely affected by litigation, compensation issues, and sick leave entitlements.[24,25] The present workers' compensation system in Hong Kong is unhelpful in terms of getting injured people to return to work, as it lacks incentives and is easily abused.

A number of challenges were encountered during the establishment and conduct of the programme. Cognitive behaviour–based pain management is new to Hong Kong and members of our team were trained overseas. This incurred significant financial resources and commitment by the various disciplines, as no other additional resource was available for these novel innovations. Moreover, teaching material and programme handouts had to be re-written or translated into Chinese to suit local needs. The programme was conducted in Cantonese, and it is unclear whether some western concepts (translated from English) may have been misinterpreted when conducted in Chinese.

Although there were no additional resources for a pain management programme, fortunately we were supported by the hospital administration. Multidisciplinary staffing was provided by the

various disciplines from pre-existing core services, and depended on the goodwill of dedicated staff. Initially staff from different disciplines attended to their allocated sessions, without any integration of input. Staff conveying different messages whilst not reinforcing each other's teaching confused the patients. Subsequently we encouraged staff to attend each other's sessions and a manual was written to facilitate information on each discipline's curriculum, thus enabling a more consistent and integrated approach for the entire programme. Initially, even booking a room at the hospital that was large enough for the programme was difficult. Once the programme was established however, organising and running it became smoother and more consistent.

One of our major challenges was patient selection. Many of our patients had relied on passive management of their pain for many years and did not have the concept of self-management. Many patients were still looking for a cure, trying out different treatment options, including traditional Chinese medicine; they had not accepted that their persistent pain was chronic and were unmotivated to change. In addition, our patients were slow to settle into a group therapy setting. They were also reluctant to share their problems, possibly related to a cultural belief in not losing 'face' (pride) in the presence of others, which may have resulted in some unwillingness to contribute to the programme discussion and dynamics. Our local patients were slow to acquire cognitive concepts and relaxation techniques. Thus, apart from a low education level, cultural aspects may also have been relevant. While Hodges and Oei[26] concluded that Chinese values and cognitive behavioural therapy are compatible, evidence in support of such a view is still scarce.[27,28] Our study adds to the evidence of existing cultural differences affecting the outcomes of cognitive behavioural therapy in Chinese patients.

The economic impact of chronic pain has been shown to be significant; it ensues via health care utilisation, loss of productivity, social welfare expenses, and litigation cost.[29] Lam et al[30] showed that role limitation by physical problems and bodily pain (in terms of SF-36 scores) had a significant effect on hospitalisation rates. Whilst Nelson et al[31] found that in chronic pain patients, health-related quality-of-life assessment correlated with medical expenses for out-patient and hospital medical service utilisation. In a local survey,[1] it was reported that in 70% of chronic pain sufferers, daily activity was affected, whereas work was affected in 38% of those who were employed; 20% of the latter took an average of 5 additional days of sick leave per year. Pain management, which has the potential to improve quality of life and function in those with chronic pain, may be cost-effective in the long run, as patients learn to cope despite pain, rather than rely on passive therapy (drugs and hospitalisation). We did not perform a cost analysis, but the spiralling costs associated with chronic pain and the greater availability of these types of programmes for Chinese populations warrant such studies. Although these types of programmes are expensive, health care administrators have to look beyond their immediate domain and redirect attention to societal costs, as savings from chronic pain management are not immediately obvious.

Interventions to modify cognition of pain improve patient self-efficacy and reduce fear-avoidance behaviour, especially when integrated with graded physical activities, coping strategies and skills training, assist acceptance and adaptation to chronic symptoms. The initial results of such pain management based on cognitive behavioural interventions in Chinese patients with chronic pain are encouraging. This type of programme appears helpful for improving physical function, psychological well-being, and productivity of affected patients. Further research in this area could help to clarify the cost-effectiveness of pain management programmes in the local population.

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APPENDIX. Comprehensive Out-patient Pain Engagement programme (week 1) timetable

Time	Monday	Wednesday	Thursday
09:00-9:45	Introduction to 'new self' (pain nurse)	Extension from baseline, introduction to goal planning and tolerance training (pain nurse)	Pacing (clinical psychologist)
09:45-10:30	Self-management (pain specialist and clinical psychologist)	Relaxation exercise (pain nurse)	Work out your goal (clinical psychologist)
10:30-10:45	Rest	Rest	Rest
10:45-11:45	Setting goals (clinical psychologist)	Stretching exercise (pain nurse)	Relaxation technique (clinical psychologist)
11:45-12:30	Work out what you learn, plan your goal (occupational therapist)	Goal planning (occupational therapist)	Learn by doing (occupational therapist)
12:30-13:30	Lunch	Lunch	Lunch
13:30-14:00	Video session of walking (physiotherapist)	Outdoor walk (pain nurse)	Outdoor walk (pain nurse)
14:00-14:45	Pros and cons of exercise and stretching exercise teaching (physiotherapist)	Training exercise (physiotherapist)	Personal exercise training (physiotherapist)
14:45-15:30	Use of timer (physiotherapist)	Basic concept of pacing (pain nurse)	Teaching on concept of pain (pain specialist)
15:30-16:30	Measurement of baseline daily activity (physiotherapist)	-	Review (medical social worker, pain specialist, clinical psychologist, pain nurse)