

Telephone Consultation Partially Based on a Cognitive-Behavioral Approach Decreases Pain and Improves Quality of Life in Patients With Chronic Pain

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Abstract

Background: Chronic pain tends to be difficult to manage because of its complex natural history and poor response to therapy. Recently, it has been reported that telecare management by nurses improved outcomes of patients with chronic pain.

Objectives: The aim of this study was to investigate the effect of a telephone consultation approach partially based on a cognitive-behavioral approach on pain and quality of life (QOL) in patients with chronic pain in Japan.

Patients and Methods: Telephonic consultation was provided by nurse care managers for the management of pain. They informed the patients how to correct or eliminate excessive fear of pain, improper thinking for treating pain, as well as how to control activity levels by appropriate pacing. We received 463 consultations about chronic pain; however, 153 patients allowed us to recall for follow-up assessment. Finally, we could evaluate the pain intensity for 121 patients and the EuroQOL 5 dimension (EQ-5D) for 37 patients at the initial call and on their condition at 3 to 6 months after that. Wilcoxon signed-rank test and Cohens'd were used for both analyses. We also asked them to rate, by feeling, marked signs of improvement, some improvement, no improvement, or deterioration in pain and QOL, depending on their condition 3 to 6 months after the initial call (n = 121).

Results: The pain intensities were significantly decreased from 7.6 ± 2.0 at baseline to 5.7 ± 2.9 on follow-ups assessed by a numerical rating scale (range; 0 - 10, $P < 0.001$, effect size (ES); 0.76). The EuroQOL 5 dimension scores were also significantly improved after telephone intervention; 0.5 ± 0.2 to 0.6 ± 0.2 (range; 0 - 1, $P < 0.001$, ES; 0.65). Moreover, as a result of the consultation, approximately half of the participants felt an improvement in the intensity of pain and QOL.

Conclusions: Telephone consultation partially based on a cognitive-behavioral approach significantly reduced the intensity of pain and improved the QOL in patients with chronic pain in Japan.

Keywords: Telephone, Nurse Practitioner, Cognitive Therapy, Chronic Pain

1. Background

Pain is the most common symptom reported in the general population and the leading cause of work disability (1, 2). Chronic pain reduces activities of daily living (ADL) and quality of life (QOL) and is a burden not only on the patient but also on family members and others involved (3-7). Musculoskeletal pain is also one of the major problems for Japan and its aging population since it requires assistance and leads to patients becoming bedridden. A national survey of 10,000 people conducted by a research group from the Ministry of health, labor and welfare in Japan showed that 15.4% of the population had chronic musculoskeletal pain when chronic pain was defined as 1; the presence of symptoms within the past month, 2; persistent pain for at least 6 months, and 3; a score of at least 5 on the visual analogue scale (VAS) (8). The survey also revealed a high frequency of low satisfaction

with treatment and doctor shopping in about half the population. Prolonged pain can lead to sleep disorders, decreased desire, anxiety, depression, decreased routine activity, occasionally causes withdrawal from society and otherwise disrupts daily activities (9). As a result, patients with chronic pain fall into a vicious circle in which these psychological and social factors complicate their condition. In such cases, satisfactory treatment outcomes may be unachievable with a uniform therapeutic approach seeking only to eliminate pain. Often a multifaceted, collaborative (multidisciplinary) intervention is needed (6, 7, 10, 11). In particular, therapeutic approaches based on cognitive behavioral therapy (CBT) under multidisciplinary approaches are recommended. Cognitive behavioral therapy seeks to deepen the understanding of one's pain and teach self-control and coping strategies. Sev-

eral studies recently reported that telecare collaborative managements substantially improved pain outcomes and secondary health-related QOL outcomes in patients suffering from pain (2, 12, 13).

With funding from the Ministry of health, labor, and welfare of Japan, we were asked to found a nonprofit organization (NPO) offering peer support and education in pain management skills to people with pain, their family and friends, and health care professionals. We founded an NPO called the 'Pain Medical Research and Information Center' in 2011 and commenced a telephone-based consultation approach in order to offer education in pain management skills and guidance on activities of daily living partially based on a cognitive-behavioral approach to people with pain and their family.

2. Objectives

The aim of this study was to investigate the effect of a telephone consultation approach partially based on a cognitive-behavioral approach on QOL of patients with chronic pain. We reported here the characteristics of chronic pain patients and the effects that a telephone-based consultation approach had on pain reduction and QOL in these sufferers.

3. Patients and Methods

A retrospective analysis was performed on people suffering from chronic pain and their family who called the NPO seeking consultation on management of their pain from July 2013 to April 2015. We received calls from all over Japan. Treatment protocols used in the present report were based on institutional policy and clinical guidelines approved by the IRB of Aichi Medical University. After obtaining approval from the IRB (reference number of Aichi medical university: 14 - 109), we routinely explained to them how we record and store demographics, symptoms, and the course of pain of all chronic pain sufferers for future possible use in our research upon their initial call. After we explained these details, we asked and obtained their consent by e-mail. In total, we received 624 calls, of which 463 patients were with chronic pain during this period. Our patients in this study suffered from various types of pain such as chronic low back pain, fibromyalgia and genital pain. Moreover, we noticed that they used various types of pain killers for the treatment.

Telephonic consultation was provided by nurse practitioners trained in assessing symptom response and medication adherence. The nurse practitioners were trained to inform the participants how to correct or eliminate excessive fear of pain, improper thinking for treating pain and anxiety caused by distorted cognition as well as how to control activity levels by appropriate pacing. They also paid close attention to converse with empathy and adopt a friendly attitude to facilitate a strong nurse-patient relationship (14).

For example, we provided the proper knowledge of

chronic pain to the patients with low literacy to decrease mal-adaptive behaviors where the patients have irrational beliefs such as "catastrophizing", "personalization" and "all or nothing thinking" (15). Moreover, we explained the fear-avoidance strategies to the patients in which keeping physical activity was important for physical and psychological function (3, 16, 17). We also encouraged the patients to achieve increased self-management and behavioral change rather than directly eliminate the locus of pain. Behavioral components included activity pacing instructions such as graded activation of daily walking (18).

On the other hand, we recommended that the patient should consult their nearest medical specialist if the organic lesion was suspected from history. Moreover, we met weekly to review cases with the pain specialists (physicians) who were also available to discuss management issues that arose between case management meetings. Participants called us once in three to six months after their initial calls. They rated the intensity of pain using a numerical rating scale (NRS) where 0 indicated no pain and 10 the greatest pain possible. Furthermore, we asked them to rate, by feeling, marked signs of improvement ($\geq 60\%$ improvement compared to initial call), some improvement ($> 20\% - 60\%$ improvement compared to initial call), no improvement ($0\% - < 20\%$ improvement compared to initial call), or deterioration ($< 0\%$ improvement compared to initial call) in pain, depending on their condition 3 to 6 months following the initial call. After July 2014, we also asked the patients about 5 questions of the EuroQOL 5 dimension (EQ-5D) (19, 20) in addition to the above evaluations.

We could recall 153 patients during the reevaluation periods which were 3 to 6 months after the initial call for each case, respectively. Finally, 121 patients were eligible to be analyzed for NRS and 37 patients for EQ-5D assessment.

In statistical analysis, mean and standard deviations were calculated for both NRS and the EQ-5D score. The values of each measure at initial and after call were analyzed with a Wilcoxon signed-rank test. The significance level was set at $P < 0.05$ in each outcome. We also used Cohens'd to evaluate the magnitude of the effect size, with $g > 0.2 - 0.5 =$ small effect size, $g > 0.5 - 0.8 =$ medium effect size, $g > 0.8 =$ large effect size (21).

4. Results

The characteristics of 121 participants are described in Table 1. Medical complaints were low-back/lower-limb pain (57.0%, $n = 69$), neck/upper-limb pain (17.4%, $n = 21$), pain at multiple sites (8.3%, $n = 10$), various facial pains (7.4%, $n = 9$), genital pain (5.0%, $n = 6$), chest pain (2.5%, $n = 3$), Whiplash-associated disorder (1.7%, $n = 2$) and frozen shoulder (0.8%, $n = 1$). The outcomes of the participants are described in Table 2, and subjective changes are shown in Table 3.

Table 1. Characteristics of the Patients^a

Variables	Values
Age, y	66 (27 - 89)
Gender (Male/Female)	26/95
Duration of pain, mo	24 (3 - 372)
Medical complaint	
Low-back/Lower-limb pain	69 (57.0)
Neck/Upper-limb pain	21 (17.4)
Pain at multiple sites	10 (8.3)
Various facial pains	9 (7.4)
Genital pain	6 (5.0)
Chest pain	3 (2.5)
Whiplash-associated disorder	2 (1.7)
Frozen shoulder	1 (.8)

^aValues are presented as No. (%) or median (range).

Table 2. Outcomes of Patients^a

Variable	Pre	Post	P Value	ES
Pain NRS (n = 121)	7.57 ± 2.01	5.73 ± 2.85	< .001 ^a	.75
EQ5D score (n = 37)	0.51 ± 0.17	0.63 ± 0.19	< .001 ^a	.67

Abbreviations: EQ5D, EuroQol 5-dimension; ES, effect size (Cohens'd); NRS, numerical rating scale; QOL, quality of life.

^aP value was assessed by Wilcoxon signed-rank test.

Table 3. Subjective Changes From Baseline^a

Rating	Pain Feeling	QOL Feeling
Marked improvement	11 (9.1)	16 (13.2)
Some improvement	47 (38.8)	40 (33.1)
No improvement	43 (35.5)	48 (39.7)
Deterioration	20 (16.5)	17 (14.0)

Abbreviations are defined in Table 2.

^aValues are presented as No. (%).

Both the intensity of pain and the QOL assessment were significantly improved after telephonic consultation. The mean score had significantly reduced in NRS ($P < 0.001$, $g = 0.75$) and significantly increased in EQ-5D ($P < 0.001$, $g = 0.67$), respectively. Both of the above assessments revealed improvement from initial status with moderate effect size (NRS; 0.75, EQ-5D; 0.65).

On the other hand, in subjective assessment, pain improvement in the 121 patients was categorized as follows: 11 patients (9.1%) with marked improvement, 47 patients (38.8%) with some improvement, 43 patients (35.5%) with no improvement, and 20 patients (16.5%) with deterioration. Quality of life improvement in the 121 patients was categorized as follows: 16 patients (13.2%) with marked improvement, 40 patients (33.1%) with some improve-

ment, 48 patients (39.7%) with no improvement, and 17 patients (14.0%) with deterioration.

5. Discussion

The results of the present study showed that a telephone consultation partially based on a cognitive-behavioral approach significantly reduced both the intensity of pain the QOL score in chronic pain sufferers, with clinically meaningful improvement of a moderate effect size. In addition, as a result of the consultation, approximately half of the patients felt an improvement in the intensity of pain and QOL.

Epidemiological surveys have recently revealed a high prevalence of chronic musculoskeletal pain in Japan (8) and there is a large number of physicians treating patients with chronic pain (22). However, 30% of the patients in the survey were not satisfied with their pain treatment (8). In the present study, we confirmed that more than 80% of patients suffered from chronic musculoskeletal pain, although they were of course prescribed analgesic agents and furthermore received various interventions such as massage, acupuncture and physical therapy.

Management of chronic pain is frustrating both for patients and for physicians because pain symptoms and the treatments among clinicians are under-recognized (23), thereby providing the patients with improper treatments. For these cases, therapeutic approaches based on CBT are recommended (11).

Several studies recently reported that a nurse-administered CBT intervention improved physical symptom burden (24-26). Similarly, our present study showed that a telephone consultation based on a cognitive-behavioral approach significantly reduced the intensity of pain and QOL in people with chronic pain.

We understand that there are several limitations to this study. First, the present report is a retrospective case series and a nonrandomized control analysis of a telephone consultation based on a cognitive-behavioral approach. People with chronic pain are likely to seek only ways to eliminate pain and have completed treatment without improved clinical outcomes at several institutions, thereby resulting in a high frequency of low satisfaction with treatment and doctor shopping. Therefore, we decided not to provide consultation based on randomized control research because if we had done so, the patients would not have offered their support. Moreover, we had to support the patients using our best knowledge because this telecare intervention was conducted based on the national program. As a result, there was no control in this study.

Secondly, patients in our study suffered from a wide range of chronic pain and there was a variety of background factors among patients such as widespread age and variable treatment methods. This mystified the estimates of treatment effective in specific body sites of chronic pain. Third, although telephone advice for the

complaint in this study was principally one time for each case before reassessment, there were several cases of repeated calls prior to three months from the initial call. This precludes the standardization for every case.

Therefore, further studies are required to confirm a telecare effect for chronic pain more clearly by selecting the disease or body site, limiting the age range of patients and adhering to predetermined treatment methods.

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Footnotes

Authors' Contribution:Kayo Ikemoto and Tatsunori Ikemoto: study concept and design. Kayo Ikemoto, Yumiko Yamagata, Takashi Kawai and Tatsunori Ikemoto: acquisition of data. Syuichi Aono and Tatsunori Ikemoto: analysis and interpretation of data. Young-Chang Arai and Tatsunori Ikemoto: drafting of the manuscript. Young-Chang Arai and Tatsunori Ikemoto: critical revision of the manuscript for important intellectual content. Syuichi Aono and Tatsunori Ikemoto: statistical analysis. Young-Chang Arai: administrative, technical, and material support. Young-Chang Arai: study supervision.

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