

Peer-Assisted Pain Management Program for Nursing Home Residents: Does it Help to Relieve Chronic Pain and Enhance Physical and Psychological Health?

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Abstract

Context: Chronic pain is common among older adults.

Objectives: To examine the effectiveness of a peer-assisted pain management program (PV-IPMP) in reducing pain, enhancing pain self-efficacy and functional mobility, reducing loneliness and increasing the level of happiness among nursing home residents.

Methods: We recruited 32 nursing home residents to participate in a 12-week group-based PV-IPMP. There were two 1-hour sessions per week. Education in pain and demonstrations of non-pharmacological pain management strategies were provided. Twelve peers were trained to assist in the sessions. Outcome measures for the participants were collected at baseline (P1) and at week 12 (P2) upon completion of the intervention. Data from peer volunteers were collected prior to training (V1) and at week 12 (V2). T-tests were used to compare the differences in outcome measures collected at two time points.

Results: A significant reduction in pain intensity from 5.8+2.6 (P1) to 3.4+2.5 (P2) was found among nursing home residents ($p=0.003$). Pain self-efficacy increased from 30.0+16.1 to 36.1+14.6 ($p>0.05$). Functional mobility significantly improved from 64.3+36.8 to 68.1+36.6 ($p=0.008$). There was an enhancement in happiness level for the nursing home residents from 16.8+5.3 to 20.6+4.4 ($p<0.001$), while the loneliness level dropped significantly from 44.5+8.7 to 34.3+8.3 ($p<0.001$). The peer volunteers showed a significant increase in self-rated pain management knowledge (2.9+2.6 to 8.1+1.2, $p<0.001$) and self-efficacy in volunteering (5.8+2.9 to 8.3+1.5, $p=0.013$).

Conclusion: The peer-assisted pain management program was feasible and effective at relieving the chronic pain and enhancing the physical and psychological health of nursing home residents.

Keywords: Medieval peer; Chronic pain; Older adult; Pain management

Introduction

Chronic geriatric pain is defined as an unpleasant sensory and emotional experience affecting persons who are over 65 years old for more than 3 months, which is associated with actual and potential tissue damage, or described in terms of such damage, and which is non-cancerous in nature [1]. In Hong Kong, 37%-50% of community-dwelling older adults suffer from chronic pain [2,3], with the prevalence being as high as 70% among nursing home residents [4]. Chronic pain has a severe impact on older adults, as it can hinder their activities of daily living and lead to depression and anxiety, decreased social interaction, impaired mobility and falls, sleep disturbances, malnutrition and, ultimately, an increase in health care utilization and expenditures [5]. Given this current burden, innovative and cost-effective ways of managing chronic pain should be developed.

Although pain management is likely to be most effective when both pharmacological and non-pharmacological strategies are utilized [6], the use of pharmacological methods has been found to be unpopular among older adults, who worried about adverse drug reactions, and accepted chronic pain as part of aging [7]. The use of non-pharmacological pain management strategies is supported as an effective approach to dealing with chronic pain [8]. The strategies include education programs, empowerment programs for pain sufferers, exercise programs, acupuncture, transcutaneous nerve stimulation, massage, relaxation therapies, cognitive-behavioral therapy, listening to music, visual stimulation, guided imagery, motivational interviewing, acupressure, and multisensory stimulation arts and crafts therapy. Indeed, the use of non-pharmacological interventions may be most appropriate for older

adults who are already taking multiple medications for their chronic diseases.

There is a paradigm shift in pain medicine towards a mechanism-based approach [9] and pain management could be more effectively provided if such a mechanism-based approach is available. Casey et al. [10] demonstrated that during a subtle shift from acute to chronic pain, the role of cognitive and affective factors becomes more significant. Psychological factors play a significant role in the causative, receptive, perceptive, cognitive, reportive and behavioural aspects of chronic pain experience among patients [11]. Cognitive factors include patients' knowledge and maladaptive understanding of pain and pain behaviour, while affective factors involve emotions and feelings associated with the pain experience. Therefore, pain management education helps to facilitate positive beliefs, problem-solving, enhanced patient functioning and self-management, and encourages active coping with chronic pain [12]. Educational interventions were shown to be beneficial when provided as in group therapy versus an individualized

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patient-therapist interactive pain talk. Such cognitive strategies have direct beneficial effects on the attention and emotions involved with the pain experience [13]. Enhancing self-efficacy through the development of adequate coping strategies can eliminate catastrophizing thoughts [14].

Therefore, an integrated pain management program (IPMP) conducted by health care professionals was carried out among nursing home residents with chronic pain in Hong Kong [4]. Nursing homes were randomized into an experimental group in which the participants (n=296) received a one-hour session of pain management education each week, or a control group in which the participants (n=239) were provided with regular care only. The content of the IPMP included pain education and an introduction to and demonstration of various non-drug strategies. The study showed a significant reduction in pain scores, and more happiness and less loneliness among the participants in the experimental group than the control group. A significant increase in the use of non-pharmacological methods of pain relief was also found among the participants in the experimental group as compared to those in the control group.

Like other chronic conditions, chronic pain requires effective self-management for optimal outcomes. Self-management is “the ability to manage the symptoms, treatment, physical and psychosocial consequences and lifestyle changes inherent in living with a chronic condition” [15]. Reid et al. investigated the evidence on self-managed interventions for pain among older adults. Among the 27 articles identified in the review, 96% showed positive outcomes from using non-pharmacological approaches to manage pain, with a median reduction in pain scores of 23% [16]. Despite the benefits of self-management for people with chronic pain, pain self-management can be challenging to implement in a busy clinical setting where health care resources are limited.

Peer support models are becoming widely used because they are cost-effective in helping patients manage chronic conditions and have shown promising results [17]. Peer support, where lay individuals receive a moderate amount of training to support those with whom they have shared experiences, has been regarded as effective self-management strategy for chronic conditions. The benefits of using peers to lead health programs include the tendency for people of similar ages and life experiences to have a high level of rapport with each other [18], and to feel less threatened when supported by someone like themselves as compared to the experience of seeking professional help [19].

Previous studies demonstrated that pain management programs with peer support yielded positive outcomes, including an improvement in perceived quality of life, functional capacity, number of complaints about pain, and belief in pain myths [20,21]. In addition, a Cochrane review showed that self-management education programs by lay individuals (rather than health professionals) for people with chronic conditions had positive outcomes, such as reductions in pain, disability, and fatigue [22]. The effectiveness of peer support interventions for community-dwelling adults with chronic non-cancer pain was also reported in a systematic review [23].

Despite the fact that peer education programs in pain management have been shown to have positive outcomes and are recognized as promising, to the best of our knowledge none of them have focused on older adults in nursing home settings in particular. An integrated pain management program (IPMP) led solely by health care professionals has been found to be effective [4]. Therefore, the question of whether an IPMP using peer volunteers for older adults in nursing homes would

also be effective seemed well worth exploring. Thus, the objectives of the present study were to examine the effectiveness of a peer-assisted pain management program (PV-IPMP) in reducing the pain, enhancing the pain self-efficacy and functional mobility, reducing the loneliness and increasing the happiness of this segment of the older population.

Methods

Study design

This study was a single group pre-post trial. Ethical approval from the Ethics Committee of the university was obtained.

Peer volunteers

Peer volunteers were recruited from a pool of regular members in the Institute of Active Ageing (IAA) of the Hong Kong Polytechnic University, which is dedicated to providing opportunities for older adults to contribute to society. The IAA staff announced and promoted this study to those members. Individuals who expressed an interest attended a selection interview. The selection criteria for the PVs included those who were >50 years old (the requirement for membership in the IAA), retired, committed to completing two 2-hour training sessions, and who had passed an exit test that included knowledge and demonstration and re-demonstration of skills on the use of the program materials and on leading the program.

Educational materials on pain relief were prepared. A “Guidebook for Peer volunteers” was given to all PVs. It included instructions on how to use the “I can do it” booklet, as well as a discussion of safety and privacy issues. The “I can do it” booklet included information on pain management strategies, the use of drugs and various non-drug therapies, and pictures of the steps involved in the physical exercises. The “I can do it” booklet was given to all participants. The contents of these materials were validated by the research team.

Participants

A private nursing home in Hong Kong was approached and their residents were invited to join our study. Inclusion criteria were older adults aged >60 years, who scored >6 in the Abbreviated Mental Test [24], have been experiencing non-malignant physical pain or discomfort either all the time or on and off for more than three months, scored >1 in the frailty index, and are able to understand Cantonese. Exclusion criteria were those with cognitive impairment and a history of mental disorders, and those with cancer and currently on cancer treatment. As this program involved physical activities, those suffering from conditions that limit safe participation were excluded. These included individuals who had suffered from a fracture or undergone surgery in the past two months, and those with severe chronic obstructive pulmonary disease, acute stroke, and acute myocardial infarction.

Interventions – PV-IPMP

Nursing home residents underwent screening. Those who were eligible to participate in the study and who consented to do so were offered a 12-week group-based PV-IPMP during weeks 1 to 12. Each session involved a small group of 6 participants. Each PV accompanied 2-3 participants each time. There were a total of 24 sessions, with two 1-hour sessions each week. Table 1 shows the details of the program. Briefly, each session was comprised of 3 components: physical exercise, interactive teaching and sharing of pain management education, and portfolio entry. All teaching components were written in the “I can do it” booklet. The session started with physical exercises (20 minutes), including towel dancing, exercises on correct body posture

Two sessions per week (Session 1: led by the research team and peer volunteers; Session 2: led only by the peer volunteers)			
Week	Physical Exercise (20 minutes)	Interactive teaching and sharing of pain management education (30 minutes)	Portfolio Entry (10 minutes)
1	Correct body posture and alignment, Stretching of arms, legs, and body muscles	Pain situations among themselves; Effects of pain in their daily life; Can we do something?	Research team and/or peer volunteers worked with the participants to make entries on the activity of the day in the "I can do it" booklet.
2	Balancing exercise	The use of an oral drug; effects & side-effects	
3	Shoulder & neck exercise	The use of a non-drug therapy: Hot pad & cold pad; how to use & safety issues	
4	Hip exercise	The use of a non-drug therapy: listening to music	
5	Knee exercise	The use of a non-drug therapy: listening to music	
6	Towel dancing	The use of a non-drug therapy: massage	
7		The use of a non-drug therapy: massage	
8		The use of a non-drug therapy: visual stimulation, watching the natural environment, & making a photo album	
9		The use of a non-drug therapy: visual stimulation, watching the natural environment, & making a photo album	
10		The use of a non-drug therapy: sense of smell & taste - making a bag of dried flowers & tasting tea	
11		The use of a non-drug therapy: sense of smell & taste - making a bag of dried flowers & tasting tea	
12		Revision & Wrapping Up	

Table 1: Contents of the peer-assisted pain management program (PV-IPMP).

and alignment, and the stretching of arms, legs, and body muscles. The second part of the session was the pain management education or revision (30 minutes), which included information on pain situations, the effects and impacts of pain on older adults, and the use of drugs and non-drug strategies in pain management. The use of non-drug therapies included viewing photographs of the natural environment, listening to music, and participating in multisensory stimulation arts and crafts activities. At the end of each session, portfolio entries on the knowledge and activities of the day were made to help the participants recall the various pain relief methods learned in class. Session 1 of each week was led by the researcher with the assistance of PVs; while session 2 of each week was led by the PVs only.

Data collection

The following data were collected from the participants at baseline (P1): demographic data (including age, gender, level of education, marital status, and frailty status), pain intensity, pain self-efficacy, functional mobility, loneliness level, and happiness level. Outcome measures were collected again at week 12 on the completion of the intervention (P2). The peer volunteers were asked to complete a questionnaire at two time points, i.e., before the training (V1) and at week 12 (V2).

The Numeric Rating Scale (NRS) was used to measure pain intensity using an 11-point scale. The NRS is a line marked in equal segments from 0 (no pain) to 10 (worst possible pain). The NRS has been shown to be a reliable and valid measure of pain intensity and pain distress in older patients with persistent pain [25].

The Chinese version of the Pain Self-Efficacy Questionnaire (PSEQ-HK) was used to assess the participants' confidence in their ability to perform specific tasks or their confidence in performing more generalized constructs such as coping with chronic non-malignant pain. It is a reliable assessment tool with satisfactory psychometric properties [26].

The Modified Barthel Index (MBI) was used to measure performance in activities of daily living, testing 10 items such as feeding, grooming, toileting, ambulation, and bathing. The score varies from item to item and the maximum total score is 100, indicating total independence. The inter rater reliability is greater than 0.95 and the test-retest reliability is

0.89 [27]. The Chinese version has already been validated and has been shown to be reliable for use with older adults with stroke [28].

Loneliness level was measured using the Chinese version of the Loneliness Scale [29]. The scale consists of 20 items to assess the participants' perception of loneliness and social isolation using a 4-point Likert scale (1= never, 2 = seldom, 3 = sometimes, 4 = always). The total possible scores range from 20 to 80, with higher scores indicating greater loneliness. The Chinese version with a Cronbach's alpha was used.

The level of subjective happiness was assessed using the Chinese version of the subjective happiness scale [30]. The scale consists of four items rated on a 7-point Likert scale. The total scores range from 4 to 28, with higher scores indicating higher subjective happiness. The Cronbach's alpha is 0.82 and the 2-week test-retest reliability was 0.70.

A questionnaire containing closed questions was completed by the peer volunteers. The peer volunteers were asked to rate their confidence in implementing the pain education program (Likert scale from 10 (the most confident) through 1 (the least confident) and their level of pain management knowledge (Likert scale from 10 (the most adequate) through 1 (the least adequate)).

Data analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS). A descriptive statistical analysis of the quantitative data was carried out. The Kolmogorov-Smirnov normality test was used to examine the normality of the outcome variables. To examine the effects of the intervention, t-tests were used to compare outcome measures collected at two time points (i.e., P1 and P2) because the data followed a normal distribution. The questionnaires for the volunteers collected at two time points (i.e., V1 and V2) were compared using a pair sample t-test. A score of $p < 0.05$ was considered statistically significant.

Results

Demographic data

Table 2 shows the demographics of the nursing home residents and PVs. Thirty-two nursing home residents participated in the study.

	Nursing home residents (n=32)	Peer volunteers (n=12)
	N (%)	
Gender		
Male	7 (21.9)	2 (16.7)
Female	25 (78.1)	10 (83.3)
Age group (years)		
Below 60	NA	6 (50.0)
60 – 69	2 (6.5)	5 (41.7)
70 – 79	7 (22.6)	1 (8.3)
80 – 89	11 (35.5)	0 (0.0)
90 – 99	11 (35.5)	0 (0.0)
Marital status		
Married	13 (41.9)	9 (75.0)
Single	0 (0.0)	1 (8.3)
Widowed	17 (54.8)	1 (8.3)
Divorced	1 (3.2)	1 (8.3)
Education level		
No Formal Education	17 (53.1)	0 (0.0)
Primary Education	10 (31.3)	1 (8.3)
Secondary Education	4 (12.5)	8 (66.7)
University Education	1 (3.1)	3 (25.0)
Chronic pain in the past 12 months		
Yes	24 (75.0)	7 (58.3)
No	8 (25.0)	5 (41.7)
Frailty Status (Frailty score)		
Frailty (3-5)	8 (25.0)	NA
Pre-frailty (1-2)	19 (59.4)	NA
Normal (0)	5 (15.6)	NA
Experience in volunteer service		
Yes	NA	11 (91.7)
No	NA	1 (8.3)

Table 2: Demographic data of the nursing home residents and peer volunteers.

	Baseline (P1)	Week 12 (P2)	P
Pain self-efficacy	30.0±16.1	36.1 ± 14.6	0.174
Pain Score	5.8 ± 2.6	3.4 ± 2.5	0.003
Modified Barthel index	64.3 ± 36.8	68.1 ± 36.6	0.008
Happiness level	16.8 ± 5.3	20.6 ± 4.4	<0.001
Loneliness level	44.5 ± 8.7	34.3 ± 8.3	<0.001

Table 3: Physical and psychological parameters of nursing home residents (n=32).

	Before training (V1)	Week 12 (V2)	P
Knowledge of pain management ¹	2.9 ± 2.6	8.1 ± 1.2	<0.001
Confidence in volunteer service ²	5.8 ± 2.9	8.3 ± 1.5	0.032

¹Using a 10-point Likert scale to rate, with 1 = the least adequate, 10 = the most adequate

²Using a 10-point Likert scale to rate, with 1 = the least confident, 10 = the most confident

Table 4: Evaluation of volunteer experience.

Most were female and over 80 years old. Over 50% of the nursing home residents were widowed and had received no formal education. Seventy-five per cent of them had suffered from chronic pain over the last 12 months. Meanwhile, twelve PVs completed the training and assisted in the program. Most of the PVs were female and about 50% of them were below 60 years old. Over 75% of the PVs were married and had received a secondary level of education or above. Nearly half of the PVs had experienced chronic pain in the past 12 months and over 90% of the PVs had participated in volunteer service in the past.

Changes in pain, pain self-efficacy, and in the physical and psychological parameters of nursing home residents

Table 3 shows the changes in the outcome measures of the nursing home residents after they had completed the PV-IPMP. They experienced a significant reduction in pain intensity from 5.8+2.6 at baseline to 3.4+2.5 after completing the intervention (p=0.003). Although insignificant, pain self-efficacy increased in an expected direction, from 30.0+16.1 at baseline to 36.1+14.6 at week 12 (p>0.05), showing that participants had more confidence in managing their pain.

There was also an improvement in the physical parameters of the participants after they had completed the PV-IPMP. Their functional mobility improved significantly from 64.3+36.8 to 68.1+36.6 as measured by the MBI (p=0.008). In terms of psychological parameters, their happiness level grew from 16.8+5.3 to 20.6+4.4 post intervention (P2) compared with the baseline (P1) (p<0.001), while their loneliness level dropped significantly from 44.5+8.7 to 34.3+8.3 (p<0.001).

Evaluation of the volunteer experience

Peer volunteers also benefited from the PV-IPMP. They were asked to rate their knowledge of pain management and self-efficacy in carrying out the volunteer service (Table 4). It was found that their knowledge of pain management increased significantly from 2.9+2.6 before the training (V1) to 8.1+1.2 upon the completion of the program (V2) (p<0.001). Their confidence in carrying out the volunteer service also increased significantly from 5.8+2.9 (V1) to 8.3+1.5 (V2) (p=0.034).

Discussion

The present study demonstrated the effectiveness of a peer-assisted pain management program in reducing pain intensity, enhancing pain self-efficacy and functional mobility, and improving loneliness and happiness levels among older adults living in a nursing home. The results add to the growing body of evidence supporting the benefits of peer volunteers in pain education programs [20-23,31,32].

In a literature review, Kawi [33] identified four barriers to the self-management of chronic pain, namely, treatment (a belief that pain-relief strategies are ineffective), personal (challenges to controlling pain due to disability, a lack of self-efficacy, and limited resources), mental health (the presence of depression, anxiety, and fear of pain), and social barriers (a lack of social support). Traditional pain education programs, which are led by health care professionals, help to transfer knowledge to the participants, overcoming treatment and personal barriers. In this study, the addition of PVs helped to address all of the barriers. PVs reinforced the pain management knowledge of nursing home residents, re-demonstrated non-pharmacological pain management strategies, praised the residents' accomplishments, shared personal experiences and developed social bonds with them, and persuaded them to adhere to treatment recommendations [34]. The success of using PVs can be seen in our findings, which included improvements in the pain levels, pain self-efficacy, and physical and psychological health of the participants.

Previous studies showed that the use of peers in pain education programs led to improvements in the pain situation of the participants, and increased their pain self-efficacy [31] and functional capacity [21,32]. However, the content and duration of the intervention, the instruments for measuring outcome measures and, most importantly, the target population differed from those in this study. Therefore, this study is the first to investigate the effectiveness of using peers in a pain education program for nursing home residents. The current study also

indicated that peer support improved the psychological parameters of the participants. Having a chronic pain condition can be a lonely experience. A previous study demonstrated that even those participants who described themselves as possessing strong social networks reported feeling isolated and lacking in support for dealing with their pain condition [32]. General social support does not necessarily ensure the receipt of effective pain-specific support, which may be difficult for the family to provide as they lack the coping resources required to support a person in pain. Therefore, peer volunteers with similar experiences may provide pain-specific support and emotional support, resulting in improvement in loneliness and happiness levels among nursing home residents with chronic pain. The positive outcomes of this pilot study provide evidence of this.

Although not investigated in our pilot study, another frequently mentioned advantage of the peer education model is that it is a cost-effective way of delivering an intervention, especially to those who may be unable to afford professional fees [35]. Given that the global population is aging and that the demand for health services is increasing, using older volunteers is considered an alternative model of delivering services, particularly where health systems are underfunded [19]. These older volunteers are not constrained by time and are readily available, cost-effective labor resource [36]. They continue to contribute to society after their retirement. Drawing on them to help older adults with chronic pain will help to reduce health care expenditures.

One of the limitations of this study was the exclusive reliance on self-reports for the quantitative data that were collected. However, it was assumed that people will be as honest as possible to the extent that they are aware of their own thoughts, feelings, and functional abilities at the time of the collecting of the data. Our subjects were also mentally intact, and oriented as to time and place. It was recognized that some patients with chronic pain may either exaggerate or minimize their reports of pain. Nonetheless, it was assumed that these reporting patterns will be consistent over time. Given that the primary focus of this study was to document changes over time, it was determined that the benefits of self-reported questionnaires provided adequate justification for their use [37]. In addition, data were collected by individuals who were not responsible for the intervention. Therefore, reporting biases were minimized as the subjects did not necessarily report positive answers to please the researchers. Another limitation of this study is that it was a pilot study with a relatively small sample size, and therefore was underpowered to determine effectiveness. The sample was limited to one nursing home, which limits the generalizability of the study's findings. However, this study has demonstrated the feasibility of recruiting and retaining peer volunteers and older adults for a peer-support intervention for nursing home residents with chronic pain.

Conclusion

To conclude, this study supports the feasibility of using peer volunteers in pain education programs for older adults. Future research involving a larger sample and a randomized controlled design will shed more light on the effectiveness of using peer volunteers for managing chronic pain among nursing home residents.

Disclosures and Acknowledgments

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