Cancer pain intensity and perceived social support in palliative care: 1-week prospective study

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ABSTRACT

Objectives Pain is a complex and multidimensional experience affected by psychosocial factors. Perceived social support (PSS) has been considered as a positive psychosocial resource for effective regulation of cancer patients’ well-being. Our study examined the relationship between PSS and pain intensity under 1-week palliative care.

Methods A prospective study was conducted of terminal cancer inpatients (N=84) recruited from the hospice ward. Pain intensity was assessed on admission and 1 week later, and patients completed self-report questionnaires assessing PSS at admission. The repeated designed analysis of variance was used to explore the correlate of PSS with cancer pain.

Results Pain intensity decreased after 1 week (t=2.303, p=0.024), and 47.62% gained pain relief. For pain intensity, there was a significant PSS group*time interaction effect detected (F=4.544, p=0.036). Pain intensity in the high PSS group was significantly reduced 1 week later (p=0.008), while the change of pain intensity was not significant in the low PSS group (p=0.609).

Conclusions PSS at admission predicted the 1-week development of pain intensity. Identifying PSS of terminal cancer patients leads to early interventions that are more effective in improving pain management of palliative care.

INTRODUCTION

Pain is probably the most common and distressing symptom in the terminal phase of cancer. Due to multifactorial aetiology, cancer pain is a complex subjective experience associated with psychosocial components.¹ Significant direct effects emerged linking higher emotional support with lower level of pain interference in patients with breast cancer.² Several systematic reviews identified a range of psychological predictors of acute and chronic pain following breast cancer surgery.³⁴ Despite the efficiency of WHO analgesic ladder, many patients with advanced cancer suffered from unrelieved pain that failed to be adequately controlled by pharmacological management.⁵ Perceived social support (PSS) has been considered as a positive psychosocial factor for effective regulation of cancer patients’ psychological/physical well-being.⁶⁷ Identifying PSS is thus important so it can then be addressed in terminal cancer pain.

PSS refers to the perceptions of availability of support or receipt of supportive acts in individuals’ social networks.⁸ Hughes et al found that PSS at the time of diagnosis predicted the post-treatment development of pain in breast cancer survivors.⁹ Stress-buffering effect may
be the possible mechanism linking PSS to pain intensity. Social support was associated with decreased pain through stress appraisal and active coping. PSS was proven to influence pain indirectly by encouraging the use of specific coping and impacting coping effectiveness. Moreover, social support acting as a safety signal modulated the perceived threat, and suppressed the activation of neural-physiological stress in response to pain. Therefore, patients with higher PSS could perceive more caring, assistance and esteem in their supportive social networks, which may contribute to the alleviation and reduction of terminal cancer pain.

We hypothesised that there were differences in the pain change of PSS groups. Patients with terminal cancer may experience lower pain intensity in the group with high PSS scores. Our study adopted a prospective design to examine the potential value of PSS on pain intensity of patients with terminal cancer receiving 1-week palliative care.

METHODS
Participants and procedures
This was a secondary analysis of prospective studies conducted at the Shengjing Hospital of China Medical University between July 2019 and October 2020. A consecutive sample of 147 patients were recruited at the hospice ward. Eligible patients were ≥18 years who had incurable cancer. Other eligibility criteria were that patients had a life expectancy <6 months on admission and gave informed consent. Participants were asked to complete the pain assessment both on admission and 1 week later. Participants completed the psychometric instruments of PSS at admission.

Patients would be excluded from analysis if their missing data were ≥30%. All missing questionnaire values were replaced with the expectation-maximisation estimates from the present data.

A power analysis was conducted with G*Power software to determine sample size needed to detect small-sized differences in pain changes among the subgroups. The following were taken into account for the procedure: effect size=0.2, α=0.05, power of 0.9 and a correlation between repeated pain measures of r=0.603. This indicated that a final sample of 76 patients was needed for a power of 0.9 at p<0.05.

Measures
Pain intensity
Cancer pain was assessed by the Numerical Rating Scale (NRS), which is one of the frequently used tools for evaluating pain intensity. Patients were asked to verbally rate their pain on a scale from 0 to 10 (0=no pain and 10=worst possible pain). The NRS was categorised as no pain (NRS=0), mild pain (NRS=1–3), moderate pain (NRS=4–6), severe pain (NRS=7–9) and worst pain (NRS=10).

Perceived social support
PSS was measured by the Multidimensional Scale of Perceived Social Support (MSPSS), which is a 12-item instrument rated on a 7-point Likert-type response (1=’very strongly disagree’ to 7=’very strongly agree’). The possible score range is between 12 and 84, with higher scores representing higher PSS. Cronbach’s alpha for this study was 0.928. All items were dichotomised as high or low by using the median score as the cut-point (median=67). High group (MSPSS score>67) presents strong PSS.

Statistical analysis
Inspection of histograms and analysis of skewness and kurtosis values for study variables revealed that data were approximately normally distributed. The distributions of pain intensity in characteristics of the study population were tested by univariate analysis. The repeated designed analysis of variance with one between-subject factor ‘group’ and one within-subject factor ‘time’ were used to explore the association of PSS with pain intensity, after adjusting for covariates in univariate analysis (p<0.05). Unstandardised simple slopes were probed and plotted to visualise the significant change in pain intensity for PSS groups. All tests were two tailed, with a p<0.05 indicating statistical significance. All data were analysed by using SPSS V.18.0.

RESULTS
Participants characteristics
There were 108 eligible patients at baseline, and 84 completed assessments at 1 week. Reasons for lost follow-up were as follows: discharged (N=16), died (N=3), refused testing (N=3) and unable to contact (N=2). Characteristics of the participants were shown in online supplemental material. Pain intensity had significant associations with KPS scores and WHO-step analgesia at admission and after 1 week.

Change in pain intensity over time
Paired samples t-test indicated that NRS scores changed significantly over time (t=2.303, p=0.024), meaning that cancer pain significantly decreased from admission (Mean=6.58, SD=3.07) to 1 week (Mean=5.92, SD=2.81). A marginally significant portion of patients (p=0.062) reported changes from admission (no pain: 9.5%, mild: 6%, moderate: 29.8%, severe: 31%, worst: 23.8%) to 1 week (no pain: 7.1%, mild: 13.1%, moderate: 29.8%, severe: 40.5%, worst: 9.5%). According to whether patients’ NRS scores were lower after admission or not, almost half of the sample (47.62%) gained pain relief, and 25% remained stable on pain intensity over time.

Effects of PSS on pain intensity at 1 week
For pain intensity, there was a significant PSS group×time interaction effect detected (F=4.544, p=0.036).
As shown in figure 1, initial NRS scores were not different between the PSS groups (t = −0.151, p = 0.88). During the 1-week period, pain intensity in high PSS group was significantly reduced (p = 0.008), while the change of pain intensity was not significant in low PSS group (p = 0.609).

DISCUSSION

Our findings should be interpreted with caution given the COVID-19 and its potential effects. The limited interaction between patients and family members is one of major challenges in China during COVID-19. Because of closed-off management and strict visitation system, absence of families’ company and long-term social distancing may influence patients’ pain intensity. Thus, the restrictions during COVID-19 could be of major influence on feelings of terminal cancer pain.

A quarter of our sample reported no change in NRS scores, and 27.38% experienced increased pain intensity over time. Given the multidimensional nature, pain not only has a biological basis but also affects and is affected by psychosocial factors, resulting in great difficulty in adequate management of cancer pain. Pharmacological method around pain control is of particularly high priority in Chinese palliative settings, which may underestimate psychosocial issues in pain management.

The current study indicated that PSS at admission seemed to be crucial in relation to 1-week development of pain intensity. Patients reporting higher initial PSS endorsed lower pain intensity within 1 week, which corresponded to our original hypothesis. PSS was a predictor and protector for terminal cancer pain in our study, which was in line with previous findings about the association between social support and breast cancer pain. The possible explanation may be related to the buffering-effect hypothesis. Based on the processes underlying the effect of social support on pain experience, Che et al suggested that pain reduction was partially mediated by the process of social support buffering the adverse influences of stress, through processes such as stress appraisal and active coping. Social support and coping were also proved to be inextricably linked in empirical research about arthritis pain, meaning that social support influenced pain indirectly by encouraging the use of specific coping strategies (eg, cognitive reframing, emotional expression and problem solving). Thus, considered as a key resource in adapting to cancer, we speculated that PSS had the analgesic effect on terminal cancer patients through the benign approach of stress appraisal and adaptive coping styles, such as decreased perceived threat of pain, reduced pain catastrophising and maintained sense of pain control described in the previous studies.

LIMITATIONS

First, the relatively small sample size affected precise causality concluded based on our findings. Second, participants in the current study were assessed at one unit, leaving the generalisability of the results in question. Finally, the observational period of a week may be insufficient to demonstrate the change of pain intensity under palliative care.

CONCLUSIONS

Pain intensity significantly decreased during 1-week period, and 47.62% gained relief from cancer pain. Patients reporting high initial level of PSS endorsed fewer pain intensity over time. Palliative care professionals should realise the importance of PSS in early evaluation and multidisciplinary interventions targeting terminal cancer pain.

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Patient consent for publication Not applicable.
**Short report**

**Ethics approval** This study involves human participants and the study design was approved by the Committee on Human Experimentation of China Medical University (reference number: 720042321006479). Participants gave informed consent to participate in the study before taking part.

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