



Re-affirmation of a Preliminary Live with Love Conceptual Framework for cancer couple dyads: A couple-based complex intervention study



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ABSTRACT

Purpose: The relational dynamics of couples may be under great strain due to the diagnosis and treatment of cancer. A complex “Caring for Couples Coping with Cancer” (4Cs) intervention program, guided by a Preliminary Live with Love Conceptual Framework (P-LLCF) for Cancer Couple Dyads, was developed to support couples going through such hardship. The purpose of this paper is to present a re-analysis of the results of the 4Cs intervention program to determine whether the findings provide evidence to support the constructs in the P-LLCF.

Methods: The 4Cs intervention was provided to support cancer patients and their spousal caregivers. The pre- and post-intervention findings of the 4Cs intervention program were re-analyzed using descriptive-correlational analysis and structural equation modeling (SEM) to test whether the findings provide evidence to support the constructs in the P-LLCF.

Results: A total of 92 out of the 117 dyads at baseline (T0) were successfully followed-up at 6 weeks (T1). The re-analysis of the findings from the 4Cs program (T1 outcomes) showed inter-relationships among the components included in the P-LLCF: dyadic mediators, dyadic coping, dyadic appraisal, and dyadic outcomes. The SEM of all six models resulted in convergence and showed goodness of fit to the data and variables, which is supportive of the constructs in the P-LLCF.

Conclusions: The present analysis of the T1 outcome measures of the 4Cs program provides evidence to support the constructs in the P-LLCF. Multiple mutual effects existed between couples in the process of living and coping with cancer as dyads.

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1. Introduction

Recognition has been growing that the experience of cancer couples is complex and relationships are dynamic (Blum and Sherman, 2010). Faced with the diagnosis and treatment of cancer, cancer couples may find their relationship coming under great strain (Dankoski and Pais, 2007). A complex intervention is needed to help cancer dyads cope with the illness.

With the intention to develop an appropriate intervention for cancer couple dyads (Li and Loke, 2014b), the Medical Research Council's (MRC) framework on developing and evaluating complex interventions (Medical Research Council, 2008) was adopted. As suggested by the MRC, it is essential that a framework be identified or proposed based on extensive literature to guide the

development of a complex intervention. A preliminary Live with Love Conceptual Framework (P-LLCF) for Cancer Couple Dyads (Fig. S1) was proposed, and published (Li and Loke, 2015).

The development of the P-LLCF was guided by the process of theoretical concept analysis (Risjord, 2009; Walker and Avant, 2005). Through the process of an extensive review, various frameworks on the experience of spousal caregivers were identified, including the Stress and Coping Model (Folkman, 1997), the Conceptual Framework of the Positive Aspects of Caregiving (Carbonneau et al., 2010), the Relationship Intimacy Model (Manne and Badr, 2008), a Development-Contextual Model of Couples Coping with Chronic Illness (Berg and Upchurch, 2007), and the Cancer Family Caregiving Experience Model (Fletcher et al., 2012).

These conceptual frameworks formed the basis and contributed to the development of the P-LLCF. According to the procedure for constructing theories (Walker and Avant, 2005), the included components of each of these frameworks were securitized for the

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essential characteristics of the coping and caregiving experience of cancer couples. The significant constructs and/or components that were considered worthwhile were tabulated under the identified key domains of the cancer couples, and finally the preliminary Conceptual Framework for Cancer Dyads was proposed (Li and Loke, 2015). For example, the Stress and Coping Model (SCM) is one of the included frameworks as conceptual basis for this P-LLCF for Cancer Couple Dyads. The key components of SCM were included in the various domains of the P-LLCF. The event specified in SCM is incorporated in the Event Situation domain; the process of problem-, emotion-, and meaning-focused coping are incorporated in the Dyadic Coping construct; and the fostering of positive emotional outcomes engendered by the unresolved stressor (Folkman, 1997) is included in the Dyadic Outcome construct.

The proposed P-LLCF, which is depicted in Fig. S1, consists of individual level and dyadic level components in three domains: Event Situation, Dyadic Mediators, and Caregiver-patient Dyads (Li and Loke, 2015). At the base of the conceptual framework are two constructs, the primary and secondary stressors of cancer couple dyads, grouped under the domain of Event Situation. The Event Situation gives rise to the need for Dyadic Mediators. The Dyadic Mediators, the relationship-enhancing behaviors and positive aspects of caregiving, act as “leverage” to balance or off-set the stressors of the caregiver-patient dyads. Event Situation and Dyadic Mediators trigger the actions of Dyadic Appraisal and Dyadic Coping, leading to Dyadic Adjustment/Outcomes. These three are grouped under the domain of Caregiver-patient Dyads.

According to the P-LLCF, supportive couple-based interventions that focus on the depicted domains and constructs (Dyadic Mediators, Dyadic Appraisal, and Dyadic Coping) will help couples to live with love and lead to positive Dyadic adjustment/outcomes (Li and Loke, 2015).

1.1. The need to re-affirm the P-LLCF

The process of the development of the **P-LLCF** has been described in a previous publication (Li and Loke, 2015). The proposed framework was tested using a mixed methods study: both focused group interviews and a cross-sectional study (Li et al., 2015b). The feasibility of the intervention program was established and the preliminary effects were published (Li et al., 2015a).

Nevertheless, as a theory of practice, it is essential for the P-LLCF to be tested in an intervention study (Walker and Avant, 2005). In the preliminary testing of the P-LLCF using focused group interview data and base-line assessments of the cancer couples, the inter-linked components and the relationship included in the P-LLCF was supported by qualitative and quantitative evidence (Li et al., 2015b). However, this cross-sectional nature of the base-line data limits the inference of causation among variables.

The 4Cs intervention program was offered to support cancer couples. The feasibility of the intervention had been tested, and preliminary positive results were reported (Li et al., 2015a). However, the results of the intervention had not been analyzed to determine whether the intervention fits well with the original framework. The framework needed to be re-tested using results of the intervention, particularly as couple-based intervention programs have been developed based on the framework (P-LLCF). Clearly, it was essential to re-analyze and re-affirm the framework.

This report is the re-affirmation of the framework through a re-analysis and re-testing of the statements and theories of the P-LLCF using the results of the 4Cs intervention study. Accordingly, the specific purposes of this re-analysis were in two folds: (1) testing the statements: to determine whether there are inter-relationships among the constructs included in the P-LLCF; and (2) testing the theory: to determine whether the domains of dyadic mediators,

dyadic coping, and dyadic appraisal have both actor and partner effects on dyadic outcomes.

2. Method

The research findings of the 4Cs intervention were re-analyzed on the basis of Walker and Avant's approach of focusing on the testing of statements and theory (Walker and Avant, 2005).

2.1. A brief review of the 4Cs program, instrument, and samples

It is important to note that only a brief report of the intervention design and process is included here for easy reference. Details on the **4Cs** program, including the essential components, delivery process, related quality assurance, procedures for collecting data, and outcomes of the intervention, can be found in a previously published report on the effects of the “**4Cs**” intervention study (Li et al., 2015a).

The essential components of the “**4Cs**” intervention, the booklet offered to cancer couples, and the measurement instruments were developed and selected based on the constructs of the P-LLCF (Fig. S2). All six sessions of the intervention were delivered by a psycho-therapist.

The questionnaire included multiple instruments measuring the three domains of the P-LLCF. The questionnaire included: a demographic and background information sheet for measuring the Event Situation, the 12-item Cancer Behavior Inventory (CBI-B) (Heitzmann et al., 2011) for measuring Dyadic Mediators, the 37-item Dyadic Coping Inventory (DCI) (Gmelch et al., 2008, Bodenmann, 2008) for measuring Dyadic Coping, and the 15-item Cancer-Related Communication Problems within Couples Scale (CRCP) (Kornblith et al., 2006) for measuring Dyadic Appraisal. Four instruments were adopted for measuring Dyadic Adjustment/Outcomes. They were: the Medical Outcomes Study 12-item short form (MOS SF-12) (version 2) (Ware et al., 1996), the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983), the revised Benefit-Finding Scale (BFS) (Antoni et al., 2001), and the 14-item Revised Dyadic Adjustment Scale (RDAS) (Crane et al., 2000, Busby et al., 1995).

The intervention program was launched from November 2013 to October 2014, and offered to married couples coping together with cancer. Couples who attended an oncology hospital in Wuxi City, China were recruited by convenience sampling. They were considered eligible if the spouse was the primary caregiver for the patient with cancer. The number of participants was calculated using G-power 3.1.9.2 (Faul et al., 2007) and according to the requirements of the analytical method of structural equation modeling (SEM) (Tabachnick and Fidell, 2013, p. 123).

2.2. Data analysis

Data entry and re-analyses were performed using the Statistical Package for the Social Sciences, version 21.0 (SPSS, Chicago, Illinois, USA). The level of significance was set at $P < 0.05$. The characteristics of the patients and the spousal caregivers were described using descriptive statistics. Testing of statements was carried out by correlation analysis to explore whether there were any inter-relationships among measured variables included in the P-LLCF.

Theory testing was conducted using structural equation modeling (SEM) guided by the Actor Partner Interdependence Model (APIM) (Atkins, 2005) using Amos 21.0. The APIM analysis is considered a versatile approach to modeling dyadic data (Atkins, 2005). In the APIM, an actor effect is the effect of an individual's characteristics (e.g., self-efficacy) on their own outcomes (i.e., marital satisfaction), while partner effect refers to the effect of an individual's characteristics on their partner's outcomes. Three

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